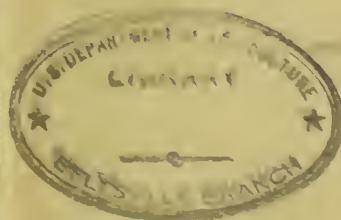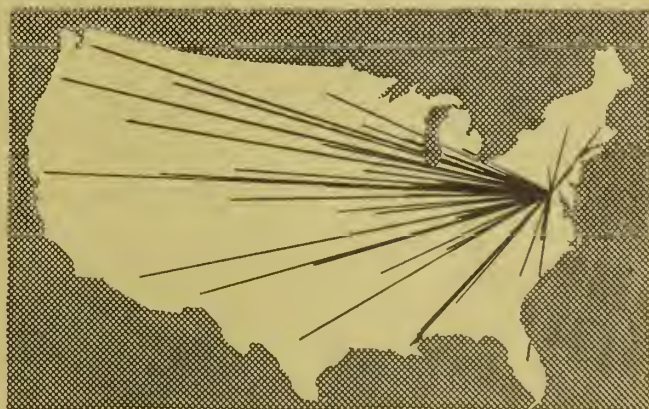THE

Agricultural

ESTIMATING AND
REPORTING SERVICES

OF THE

United States Department
of Agriculture

Miscellaneous Publication No. 703

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

United States Department of Agriculture

THE AGRICULTURAL ESTIMATING AND REPORTING SERVICES OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

FOREWORD

This publication is the result of the joint efforts of many members of the staffs of the Bureau of Agricultural Economics and the Production and Marketing Administration. The first 19 chapters were written by members of the staff of Agricultural Estimates. Chapters 20 and 21 were written by staff members of the analytical divisions of the Bureau of Agricultural Economics. Chapters 22 and 23 were contributed by members of the technical staff of the Production and Marketing Administration. Chapter 22 is the joint product of the Market News Divisions of the Cotton, Dairy, Fruit and Vegetable, Grain, Livestock, and Tobacco Branches, the Information Branch and the Marketing Research Branch; and Chapter 23 was written by the Marketing Facilities Branch.

The names of the authors of the individual chapters appear under the chapter titles. Richard K. Smith and Walter A. Hendricks of the staff of Agricultural Estimates reviewed all chapters. Thomas C. M. Robinson of the Division of Special Farm Statistics and Everett Bierman of the Division of Economic Information were directly responsible for the assembling and editing of the publication.

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United States Department of Agriculture

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Prepared by Bureau of Agricultural Economics and Production and Marketing Administration

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CHAPTER I.   PURPOSE

By Thomas C. M. Robinson

Agriculture in the United States is ever-changing and continent-wide in scope. It embraces nearly 6 million farms, extending from the potato fields of Maine across the broad cornfields and wheatfields of the interior to the orange groves of California, and from the cattle ranches of Montana to the cotton plantations of the deep South.

The nature and scope of our agriculture are reflected in the almost daily reports of the Crop Reporting Board. In June, a typical month, the Board's reports range from the semimonthly Truck Crop News to the spring Pig Crop Report; from a general report on crop production to the reports on agricultural prices and farm labor. During the same month market news reports on prices and receipts of fruits and vegetables, livestock, dairy and poultry products, grain, cotton, and tobacco are issued on each business day.

To America's 27½ million farm people these statistics are direction finders. They help the farmer to chart a course to more efficient production and marketing of his product. Agricultural statistics help others too. They help processors and distributors to iron out some of the kinks in the tortuous road a product travels from the farm to its ultimate consumer, benefiting both producer and consumer. They help manufacturers of farm machinery and supplies locate their best markets. And, to the farmer, this means the kinds of goods he wants are a little more likely to be ready for him to buy.

In addition to the original users of agricultural statistics—mainly farmers, processors, distributors, and lending agencies—the Government itself in recent years has been making increased use of agricultural statistics. Government actions in the fields of production control, allocations, price supports, and conservation, are based upon a wealth of statistical information. It is a truism that statistics are the factual information without which modern government cannot operate. This is especially so in time of war when our Government must accurately judge farm production capacity before it sets production goals and allocates scarce commodities.

Agricultural statistics have actually made their biggest growth in wartime. Examples include the War Between the States, when agricultural-statistics work was made a part of the

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new Department of Agriculture; World War I, when semimonthly condition reports were begun on sweet corn, cucumbers, lettuce, and several other vegetables; and World War II, when the Crop Reporting Board, in order to facilitate the movement of crops to market by our overburdened transportation system, made estimates and forecasts by districts of the production and stocks of grain crops that would require storage, and by counties of available storage facilities.

Other users of agricultural statistics might be named—daily newspapers, farm and trade publications, radio broadcasting systems, and now even television in a small way. Agricultural statistics are used internationally too; a good example is the International Emergency Food Committee of the Food and Agriculture Organization of the United Nations.

Probably most immediately concerned with the methods used in preparing agricultural statistics are the people who play a part in the statistical work of the Department, the professional users of the Department's statistics, and those who work with agricultural statistics in foreign countries. It is primarily for these three groups—the first and third essentially agricultural statisticians and governmental administrators, and the second, agricultural economists and commercial users of agricultural statistics —that this publication is intended.

HISTORY

The statistical work carried on by the Department is older than the Department itself. Over a century ago farmers began to realize that they were at a disadvantage when bargaining because they knew less about crop and livestock supplies than did the people to whom they sold. The first attempt to improve the farmer's bargaining position by increasing his knowledge of crop conditions took place in 1839, when Congress authorized the Patent Office to spend $1,000 for the distribution of seeds and the collection of agricultural statistics.[1] The Commissioner of Patents, whose interest and initiative were responsible for the appropriation, prepared and published annual estimates of the production of about a dozen major crops for each of the years from 1841 until his resignation in 1845. The new Commissioner was not particularly interested in agricultural statistics, so the publication of statistical tables in the Commissioner's annual reports was discontinued.

The transfer of the Patent Office to the newly established Department of the Interior in 1849 did not result in the resumption of publication of agricultural statistical data, and the pressure for an impartial Government agency to collect and disseminate current information on the supply of agricultural products continued to mount.

When the Department of Agriculture was established by act of Congress in 1862, one of the original prescribed functions of the Commissioner of Agriculture was to "acquire and preserve all information concerning agriculture, which he can obtain by means of books, correspondence, and by practical scientific experiments (accurate records of which experiments shall be kept in his office), *by the collection of statistics*, and by any other appropriate means within his power." The means placed at the disposal of the Department to discharge this obligation were modest; the first identifiable appropriation solely for agricultural statistics was $20,000 for the 1865 fiscal year. Starting in the summer of 1863, however, the Commissioner published monthly reports on the condition of crops based on information received from volunteer crop reporters in each county. In 1866 annual reports on acreage, yield per acre, and production of important crops were initiated, as were reports on January 1 livestock numbers. In January 1867 a report was issued on December 1 average prices of important farm products produced during 1866 and the January 1, 1867 values per head of major species of livestock on farms. From that time to this, continuous series of agricultural estimates on acreage, yield, and production of major crops and numbers of major species of livestock have been available.

As the country has continued to develop and market areas have continued to enlarge, there have been many requests for more frequent reports on the production and marketing of agricultural products. On the whole, these requests have been based on genuine needs for the information, and the Congress and the Department have responded by expanding the scope of the Department's statistical coverage accordingly.

SCOPE

No attempt will be made to list all of the types of statistics which are now issued by the Department of Agriculture. The following brief review merely sketches the approximate scope of the current statistical work of the Department.

At present, the Bureau of Agricultural Economics, the principal statistical organization of the Department, publishes throughout the year statistical reports that give current na

tional and State estimates of production, stocks, and prices received by farmers, for more than 150 farm products. These reports include estimates of the acreages of the crops farmers intend to plant, acres planted for harvest, and harvested acreages. During the growing season monthly forecasts of production are made on the basis of crop conditions or probable yield per acre as they are reported to the Department on the first of the month. Reports on the condition of pastures and ranges are issued monthly by States. Production estimates for 136 crops, including fruits, nuts, vegetables, and field crops are published regularly.

Statistics concerning livestock and poultry production include annual estimates of numbers and classes of livestock and poultry on farms January 1, and annual estimates of calf and lamb crops and chickens and turkeys raised. Estimates of the pig crop are made twice a year; the report in June covers the spring pig crop and intentions for the fall; the report in December relates to the fall pig crop and intentions for the following spring. The volume of milk and eggs produced is estimated monthly, and that of wool and mohair annually. The number of chicks hatched in commercial hatcheries is estimated monthly, and weekly reports are made for areas in which broilers are important.

A complete enumeration is made each year of the factory output of about 45 kinds of dairy products. Monthly and weekly estimates are made currently for the more important dairy products. Dairy plants keep comparatively accurate records of production and in many States collection of data is facilitated by State laws requiring the firms to report the quantities manufactured. In 27 of these States the Bureau of Agricultural Economics has entered into cooperative agreements with certain State agencies to provide for the joint collection of these reports. These conditions, plus a diligent followup program in obtaining reports from delinquent plants, have resulted in statistics of manufactured dairy products that are nearly 100 percent complete.

Forecasts and estimates of agricultural production are made for the United States and for each of the 48 States. County estimates for a few major products are published annually in nearly all States, and county estimates for most of the important products are published in a third of the States. In 12 of these, county estimates are based on an annual Assessors' State Farm Census of crop acreages.

Except for a few minor agricultural commodities, the present program of the Bureau provides current measures of agricultural production. Two fields that are only partially covered are market-garden vegetables grown adjacent to metropolitan areas and crops of bush fruits. A start is now being made for such reports for the New York City area, where more than 60 different vegetable crops produced locally are sold in the New York City market. A beginning has also been made in the Boston area. These beginnings were made possible through the use of State funds and funds made available by the Research and Marketing Act for extensive surveys of market-garden crops in two areas.

In addition to measures of production, the Bureau makes many other estimates. Examples are quarterly estimates of grain stocks; monthly estimates of the number of people working on farms, by regions; quarterly estimates of farm-wage rates, by States; monthly estimates of prices received by farmers; monthly estimates of prices paid by farmers for a considerable list of food items and quarterly estimates of prices paid by farmers for most other major producer and consumer goods bought by farmers; monthly estimates of farmers' cash receipts; triannual estimates of farm land values; and annual estimates of the farm population (in cooperation with the Bureau of the Census, Department of Commerce).

Certain additional statistical series originate within the Department, but outside of the Bureau of Agricultural Economics. Examples include the daily and weekly price and volume reports on grains, livestock, fruits, and vegetables arriving at or sold on the more important central markets; monthly reports on stocks of perishables in cold storage; and quarterly reports on stocks of leaf tobacco owned by manufacturers and dealers, by type. Commodity statistics of an essentially administrative nature, such as stocks of corn owned by the Commodity Credit Corporation or under CCC loan, are often invaluable when estimating total stocks on a given date, but the method of assembling such information is not discussed in this publication, since these statistics are prepared primarily for internal use within the Commodity Credit Corporation or Production and Marketing Administration. The preparation of occasional and nonrecurring estimates, whatever the phenomenon, will not be discussed in this publication.

By Thomas C. M. Robinson

ORGANIZATION

A fundamental feature of the Government's agricultural statistical organization is that most of it is located within the Department of Agriculture, instead of being a branch of a central statistical organization with inclusive responsibilities. With the exception of the Bureau of the Census in the Department of Commerce, which takes a Census of Agriculture once every 5 years, no governmental agency outside of the Department of Agriculture is responsible for any considerable body of official statistics pertaining to agriculture. This is in contrast with the situation in Canada, where the agricultural estimating service is part of the Dominion Bureau of Statistics, Ministry of Trade and Commerce, rather than of the Ministry of Agriculture. The agricultural estimating services of both countries are looked upon as models on which the services of other countries are often patterned.

The organization of the Department of Agriculture has varied somewhat from decade to decade, with resultant changes in the relationships existing between the various individuals and organizations engaged in agricultural estimating work. A brief history of the stages through which the organization has passed might be of some interest to many readers, but as it is extremely doubtful whether the same course would be followed by any other statistical organization, the space required for such a history is instead devoted to a description of the present organization.[2]

The Bureau of Agricultural Economics is one of the staff offices of the Department of Agriculture. It is "the primary agency in the Department for the collection and dissemination of agricultural statistics, for economic research, and for the dissemination of the results thereof. As a staff agency of the Secretary, the Bureau also coordinates the statistical work and economic research of the Department."[3]

[2] The reader interested in the history of agricultural estimating is referred to (1) United States Department of Agriculture Miscellaneous Publication 171, The Crop and Livestock Reporting Service of the United States, 104 pp., 1933, and (2) Journal of Farm Economics, November 1939. See footnote 1, p. 2.

[3] United States Department of Agriculture. Directory of organization and field activities of the department of agriculture: 1947. U. S. Dept. Agr. Misc. Pub. 640, 1948. See p. 3.

To accomplish this mission the Bureau is organized under the Office of the Chief, which includes administrative and analytical personnel, and four groups of operating divisions, each group under an Assistant Chief of the Bureau. One of the four groups is known collectively as the Agricultural Estimates branch and consists of the Divisions of Field Crops Statistics, Fruit and Vegetable Statistics, Livestock and Poultry Statistics, Dairy Statistics, Agricultural Price Statistics, and Special Farm Statistics. These are technical divisions located in Washington and generally have no field personnel. The Assistant Chief for Agricultural Estimates is also Chairman of the Crop Reporting Board, the membership of which is drawn from the personnel of the Office of the Assistant Chief, the 6 divisions listed above, and the 41 State offices of Agricultural Estimates. The Crop Reporting Board has a permanent secretary.

It is with the work of Agricultural Estimates that this publication is primarily concerned, since the bulk of the current primary agricultural statistics of the Government is collected by Agricultural Estimates. The estimating functions of the economic research divisions will be described very briefly in contrast with the more exhaustive description of the functions performed by Agricultural Estimates. The collection and reporting of statistics by other agencies of the Department, such as the market news services of the Production and Marketing Administration, will also be described briefly.

The organization of Agricultural Estimates is shown in Figure 1.

The statistical methodology, computing and records, report processing, and administrative services sections are attached directly to the Office of the Assistant Chief. Lines of authority run directly from that office to the 41 State offices, the livestock office in Denver, the dairy office in Chicago, and the three cooperative statistical research laboratories of the State Agricultural Colleges of Iowa, North Carolina, and Virginia.

COOPERATION WITH STATE AGENCIES

Before 1917, the agricultural estimating work was carried on by the U. S. Department
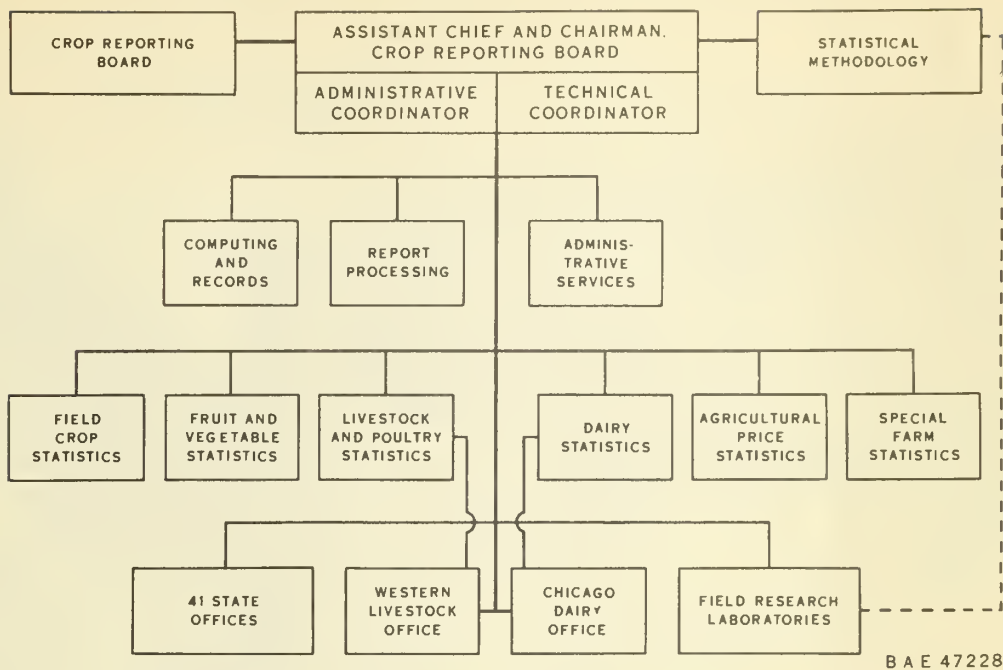
FIGURE 1.—Organization of Agricultural Estimates Branch of BAE.

of Agriculture as a strictly Federal program with no official cooperation with any State governmental agency. By that time, several States, including Kansas, Iowa, and Wisconsin, were making State and county estimates of crop production and livestock numbers. The desirability of a joint Federal and State crop reporting program that would avoid duplication and improve the estimates was discussed from time to time. In the spring of 1917 the first formal agreement was entered into with the Wisconsin Department of Agriculture. A few months later a similar agreement was reached with the State Industrial Commission of Utah. Agreements with Missouri and Nebraska followed in the spring of 1918 and with Ohio in the fall of that year. During the early 1920's agreements were concluded with many other States.

In a few States, agreements have been entered into with a department of the Land Grant College. In Indiana, for instance, the agricultural estimating program is conducted in cooperation with the State Experiment Station.

At present, cooperative agreements covering the general crop and livestock reporting work are in effect with 28 State departments of agriculture and 9 State agricultural colleges, universities, or experiment stations, and agreements are pending in other States. In addition, cooperative agreements covering dairy-manufacturing statistics are in effect with 26 State departments of agriculture and 2 State agricultural colleges. The program of cooperation with

the State departments of agriculture or other State agencies has been extremely successful, not only from the standpoint of the agencies concerned, but from that of the public as well. By combining the work of the Federal and State agencies in the field of agricultural statistics, not only is duplication of effort eliminated, but more fields can be covered and these more intensively. In general, State funds make possible the preparation and publication of agricultural information by counties or other areas within the State.

In 5 States no cooperative agreements are in effect between a State agency and the Bureau, and in 7 more States the agreements cover only dairy-manufacturing statistics. But in none of these 12 States are regular crop or livestock reports issued by a State agency. The crop and livestock reports for these States are entirely the responsibility of the Bureau of Agricultural Economics.

Figure 2 shows the States in which cooperative agreements are in effect covering either general work of agricultural estimates, or dairy-manufacturing statistics, or both. The map also shows the location of the State offices and the type of agency with which the cooperative agreement is made. It should be noted that one office serves the 6 New England States, that Delaware is served from the Maryland office, and that the office in Salt Lake City serves both Utah and Nevada.

LOCATION OF STATE OFFICES OF AGRICULTURAL ESTIMATES, BUREAU OF
AGRICULTURAL ECONOMICS, AND STATUS OF COOPERATION WITH
STATE AGENCIES, COLLEGES, AND UNIVERSITIES,
MARCH 1, 1949
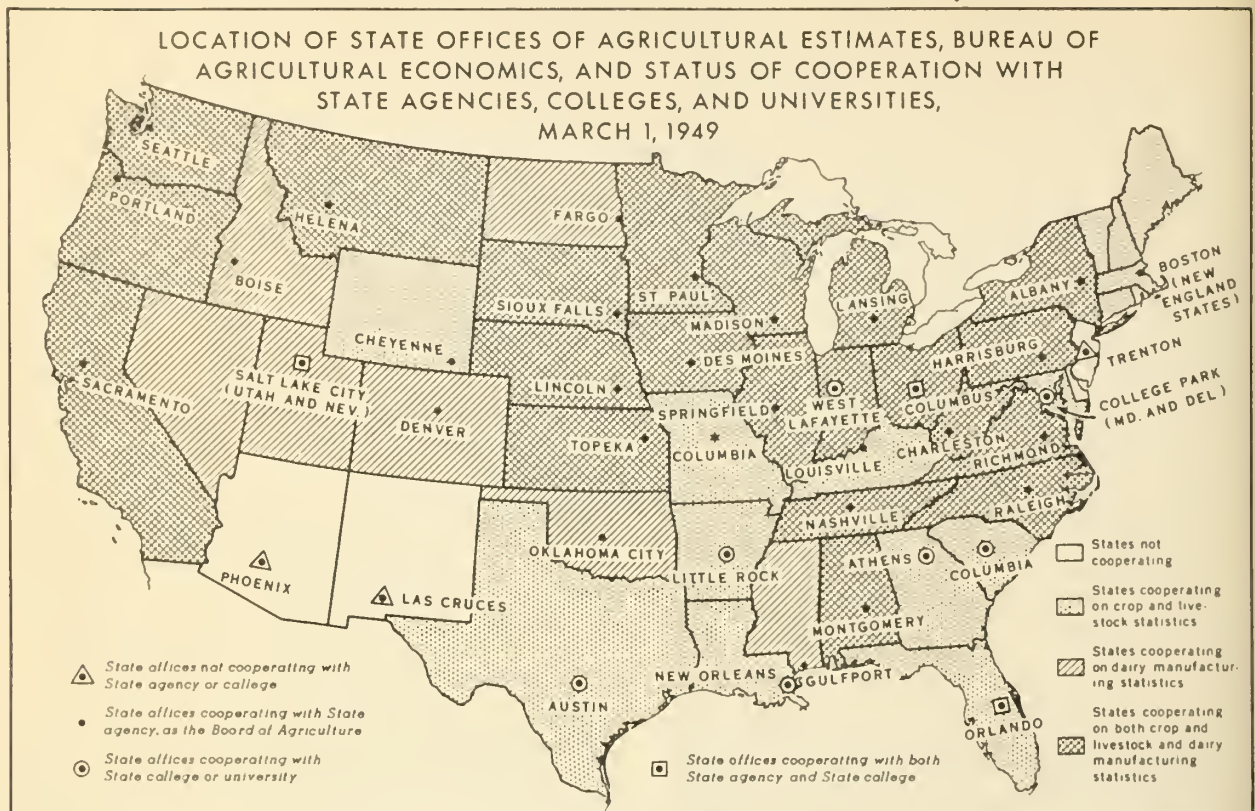
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FIGURE 2.—Location of State offices of Agricultural Estimates, Bureau of Agricultural Economics, and status of cooperation with State agencies, colleges, and universities, March 1, 1949.

COOPERATION WITH INDIVIDUAL FARMERS AND BUSINESS CONCERNS

The entire estimating service is cooperative in the fullest sense, for the larger part of all information obtained comes from individual farmers and business men who cooperate with their fellows and with the Department to pool their information for the common good. The Department is largely dependent upon the willing cooperation of hundreds of thousands of voluntary reporters who complete and return questionnaires, with no reward other than the knowledge that they are performing a public service and that the official reports are more accurate because of their help.

Federal or State laws do require companies to report on some items, as in the case of cotton ginnings, peanut processing, or the manufacture of dairy products, which results in nearly 100 percent coverage. The estimating and reporting work of the Department has always been completely separated from the functions of taxation and production control. Most farmers are now convinced that they can report their actual number of cattle or acreage of cotton to the Crop Reporting Board without fear that the information will be turned over to the local tax assessor or to any production-control authorities of the Department. The genuine belief that individual reports are confidential and privileged removes one of the most serious psychological bars to cooperation.

By Thomas C. M. Robinson

PERSONNEL

The hiring and training of qualified personnel is one of the greatest problems of those who are responsible for the building of a statistical organization. When the first agricultural statistics were collected in the early 1840's it was the part-time work of a few employees in the Patent Office. At present (in the winter of 1948-49) the organization of Agricultural Estimates alone, exclusive of other divisions of the Bureau of Agricultural Economics or other parts of the Department of Agriculture which carry on some statistical estimating services, consists of approximately 750 persons. About 220 are professional people, 410 have clerical or administrative duties, and approximately 120 are State employees, mostly clerical, paid entirely by cooperating State agencies.

As the work of agricultural estimating has developed, the kind and training of the people engaged in it have gradually changed. Originally personnel assigned to agricultural estimating work were men who had an interest in agricultural statistics and a knowledge of farm conditions. The profession of statistics as it is now known had not yet emerged. At first, professional personnel were assigned exclusively to duty in Washington, and all field contacts were handled by correspondence and field travel out of Washington. As the demands upon the service grew, field personnel were added to assume partial responsibility for some phases of the estimating work in rather broad regions. There was considerable expansion of work in 1913 and 1914 and a professional statistician was appointed for every State or group of minor agricultural States. As the work expanded still further, assistant statisticians and clerks were appointed in each of the offices.

By the middle of the 1920's the new science of statistics had been recognized to the extent that courses were being offered in many colleges and universities. Special Civil Service examinations were announced from time to time for agricultural statisticians, and only those who were able to pass such examinations were offered professional appointments. At first, only a college degree, with no formal course work in statistics, was the necessary qualification for an examination; but there has been a steady increase in the number of semester hours of formal statistical training required before a candidate is considered eligible to take an examination. At present, a minimum of 6 semester hours is required of all candidates. In addition, a farm background, or a series of courses in agriculture at a recognized college of agriculture, is also a prerequisite for appointment. To augment the training of the entire professional staff, several statistical short courses have been given for both Washington and field personnel. In-service training courses are frequently given in Washington, and the employees also have access to a wide selection of statistical and other courses in the Graduate School of the Department of Agriculture. In addition, several statisticians have taken leave of absence to pursue advanced statistical courses at universities. The education of a statistician is a never-ending process.

The clerical personnel of the Agricultural Estimates branch are ordinarily chosen because of previously acquired skills as typists, stenographers, comptometer operators, or statistical clerks. They are virtually all high-school graduates and some have college and graduate degrees.

A typical State statistical office, which in 1922 had 1 statistician and 1 clerk, now has 3 statisticians, 6 clerks, and frequently one or more State employees. In a few of the major States where State contributions are high, the number of persons employed in the joint State-Federal office runs much higher than this, and some of the professional employees are paid by the cooperating State agency.

Practically all of the personnel paid from Federal funds have Civil Service status. Their appointments are nonpolitical, their salaries are based on an impartial classification of the duties performed, and their tenure of position is relatively assured so long as their work is satisfactory. The professional appointments in Agricultural Estimates are looked upon as career positions. The length of service of the statisticians now on duty averages about 14 years, and ranges from a few months upward to 43 years.

In an organization as large as this, with 41 State offices, 2 commodity field offices, 3 cooperating research laboratories, and 6 operating divisions in the Washington headquarters, the necessity for training personnel on the job

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has resulted in the adoption of certain fairly definite personnel policies. First of all, professional personnel are ordinarily assigned at first to a field office where, under the direct supervision of the State statistician in charge, the rudiments of the agricultural estimating procedures, particularly so far as they relate to that State, are learned.

After a minimum of approximately 2 years in a State office, a new man, if he has progressed satisfactorily, is eligible for a move to another State office with a somewhat different set of estimating problems. Here he will ordinarily be assigned to a position that is rated somewhat higher where, under the tutelage of the statistician in charge, he gains experience for another 2 or 3 years. Later assignments will depend upon his demonstrated abilities and the needs of the service. He may be assigned to one of the operating divisions in Washington for a minimum of 2 years, after which he may be either assigned to a more responsible position in the Washington division or returned to yet a third field office, sometimes as second in charge. Some men progress to jobs of increasing responsibility without ever serving in Washington, and, in some cases, without ever leaving the States of their first appointment, but such cases are rare.

FACILITIES

As the agricultural estimating organization has grown through the years, facilities such as office space and equipment have increased markedly to accommodate the expanded scope of operations. Eighty years ago no office space was required outside of Washington, transportation was by common carrier or livery rig, and neither typewriters nor other office machines were used. The field statisticians of 40 years ago had no offices, as they used their homes as headquarters. Today, by way of contrast, 46 field offices are maintained by Agricultural Estimates, and the equipment ranges in specialization from automobiles to an International Business Machine installation in the Washington office.

About 40 percent of the field offices are in such Federal buildings as post offices or customhouses, 30 percent are located in buildings belonging to a State government or a State college, and 30 percent are in commercial space on which the rent ordinarily is paid by the Federal Government.

Supplies for the field offices are almost all procured by the Washington office and shipped direct from the supplier to the field office. During 1948, more than 15 million outgoing and return envelopes were used by the field offices and 700 thousand outgoing and return envelopes were used by the Washington office.

FUNDS

As the number of persons in agricultural estimating work and the variety and detail of the estimates have increased through the years, the total cost has risen accordingly. The annual appropriation from 1865 through 1880 never exceeded $20,000; but the appropriation for 1883 jumped to approximately $100,000; and $200,000 was exceeded for the first time in 1907. The 1917 budget was more than $300,000, the 1922 budget exceeded $400,000, the 1925 budget was more than $600,000, and the 1930 budget passed the $800,000 mark. The first million-dollar budget was for the fiscal year 1932, but if funds earmarked for "foreign agricultural statistics" are excluded the figure was about $800,000. Regular appropriations were slightly smaller during the next 11 years, but funds received for special estimating jobs performed for various action programs held total expenditures in the range of a million to a million-and-a-half dollars through 1944. The rapid increases in costs since the end of World War II, together with some expansion in statistical coverage, have resulted in an increase in expenditure of Federal funds to approximately $2,460,000 in the year ended June 30, 1948, of which $2,230,000 came from the regular appropriation and $230,000 from appropriations under the Research and Marketing Act and other special funds.

In addition to these Federal funds, the various States have been increasing their contributions to the support of the cooperative offices since the first cooperative agreement was made with Wisconsin in 1917. In recent years the total State contributions have been about one-sixth as large as the total Federal expenditures.

Of the Federal and State funds expended in fiscal 1948, exclusive of the rental value of office space in Federal and State buildings, about 80 percent went for salaries; more than 7 percent was paid for travel; supplies, equipment, and services accounted for about 7 percent; duplication and printing costs were about 2½ percent; and smaller sums went for rent, utilities, communications, and transportation of things.

CHAPTER 4. STANDARD OPERATING PROCEDURES

By Thomas C. M. Robinson, Ida J. Trowbridge, and Lester J. Hoffman

PRINCIPLES AND POLICIES

Later chapters of this publication are devoted to rather detailed descriptions of the specific statistical techniques and estimating methods used in preparing the various types of estimates published by the Washington or State offices every year. Aside from statistical techniques, however, there are many operational procedures of such general importance and universal application that they provide a setting for the following discussions of the technique of estimating. This chapter reviews the general estimating procedures and their application to the preparation of a particular report.

At least seven policies of operation seem to be essential to success: (1) Centralization of authority and standardization of procedures; (2) making records permanent, (3) striving for accuracy, (4) rigid scheduling of reports, (5) safeguarding confidential information, (6) preventing speculation by insiders, and (7) releasing unpublished data, with adequate safeguards, to governmental or educational agencies for administrative or research purposes.

The Agricultural Estimates divisions, including all of the cooperative State offices, are part of one Federal statistical agency, not a confederation of State agencies. Statisticians in charge of State offices have considerable latitude in choosing the methods to be used to obtain information and to expand it into estimates for their own States. Procedures that are standardized by the Washington staff ordinarily grow out of field experience and suggestions. In general, however, and in the absence of explicit and previously approved authority to depart from standard procedures, the central office in Washington prescribes the questionnaires to be used and the methods of summarizing and analyzing the information obtained by the questionnaires.

All questionnaires in which the Federal Government has a direct interest or which are mailed under the Governmental franking privilege must be approved in advance by the Division of Statistical Standards, Bureau of the Budget, Executive Office of the President. Only when an inquiry is strictly a State affair, being mailed under postage, may the statistician in charge proceed without approval from Washington; even then, notice of plans, including a copy of the proposed questionnaire, is ordinarily sent in advance to the Washington office. This is done partly as a matter of information, but primarily as a means of obtaining suggestions that grow out of experience elsewhere.

To guard against loss, permanent records of State Statisticians' recommendations and of official forecasts and estimates are maintained, in duplicate, in the Washington and the respective field offices. Such recommendations and estimates are transmitted to and from Washington on official summary forms, often known as shuttle sheets, to minimize the possibility of differences between records in the Washington and the State offices. At any given time there is one and only one official estimate of any given item. Later forecasts or revisions of estimates are labeled as such.

Because of the great dependence placed upon all official estimates and forecasts issued by the Department, they are as accurate as possible. Computational errors are guarded against by the incorporation of internal checks, such as sum checks, wherever possible. When that is not possible, computations are checked by independent calculation by another worker. All transcriptions except that from the original questionnaire to the listing sheet are verified.

Publication of current reports relating to agricultural production for the United States as a whole and for each of the 48 States—intentions to produce, prospective production, and estimates of production—to be of maximum value must be made as early as possible. For example, the monthly crop reports relating to conditions as of the first of the month are issued between the 8th and 11th of the current month and the twice-a-year reports of hog production (the Pig Crop Reports) are issued 18 to 20 days after the end of the 6-month period covered by the report. Somewhat more time (about 6 weeks in all) is required for preparing and issuing the annual December report of harvested acreages and the production of all crops. For more than 80 years the public has been served through this kind of a timetable, which is rigidly followed. The release dates for all reports for an entire year are announced early in the year. The appearance of the reports at a given hour on a given day can be anticipated by the press and radio, which has advantages to them and the public as a whole.

All individual information given by reporters

in response to questionnaires or personal inquiry is kept confidential. It is never made public or available to anyone outside the Agricultural Estimates organization. An obvious effect of this rule is that biases due to fear of taxation or regulatory actions are minimized, for the reporter is confident that the information he is furnishing will never be seen by the local tax assessor or any other individual who is not a member of the Agricultural Estimates staff. The rule prevents the publication or release of statistics for States or smaller geographic areas in which only 2 or 3 individuals or concerns account for all of the production or consumption of a given item, for the publication of area totals would make possible, by a process of subtraction, the derivation of information about individual operations.

Not only must individual reports be held in strictest confidence, but the official forecasts and estimates of the Crop Reporting Board must not be learned by any individual before their release to the public. All employees of the Bureau of Agricultural Economics, both in Washington and in the field offices, are forbidden to speculate in agricultural commodities. Fines up to $10,000 and imprisonment up to 10 years are provided as penalties. In addition, procedures that are described briefly in this chapter have been devised to prevent the premature release of official information for purposes of private gain.

The general rule is that no estimate will be released as official unless it (1) is of interest and importance to a significant number of people and (2) is of serviceable accuracy. In preparing estimates that meet these two requirements for publication, estimates are often prepared incidentally for subcategories or smaller geographical areas. These components of the published estimates, although not meeting the requirements for publication, may be useful either as guides for administrative action on the part of Government agencies or as raw material for research at universities or other noncommercial research organizations. In such cases, if one of these institutions or organizations requests access to unpublished information and promises in writing not to make it public, the information is made available to it on such a conditional basis. Information collected from any one individual reporter is never released.

A sustained effort is made to use the most economical method of attaining any given end. The steps in issuing a routine report can best be understood by considering an example, beginning with a typical State office and following through to the release of the report from that State office. The August General Report in Illinois is selected as an illustration.

PROCEDURES IN THE FIELD

Early in the year the Illinois office receives a schedule of release dates which indicates that a General Crop Report will be released on August 10. About the middle of July the State Statistician receives a set of instructions covering the preparation of the report and a supply of the August general schedule (questionnaire), which has been designed, approved, and printed in Washington, D. C. The schedule used in Illinois is the same as that used in Missouri, where about the same crops are grown and harvest occurs at about the same time, but it differs from those used in other States, because of differences in crops grown or progress of growth.

The Illinois office has mailing lists that include the names of about 4,000 crop reporters. About the middle of July the office addresses an envelope to each of its crop reporters enclosing a copy of the August General Schedule and a franked return envelope addressed to the State Statistician in Illinois. The outgoing envelopes are mailed between the 25th and the 27th of July, depending somewhat on the time it takes mail from the State office to reach the addressee.

When returned envelopes begin to come back to the State office about the end of July, they are opened and as each schedule is removed the clerk looks at the space where the name and address of the reporter are supposed to have been entered. If that space is still blank, the name of the post office is entered on the schedule from the postmark on the envelope. Schedules are then sorted, first by crop-reporting districts and then by counties within each district.

Data from the questionnaires are listed or tabulated in ink, by hand, on large listing sheets, ruled so that the columns are exactly the same width as those on the schedule. Headings are inserted on the listing sheets by means of a multistamp. (Listing sheets with printed headings are used in some States.) Tabulation is accomplished by laying the schedule to be listed on the listing sheet so that it just covers the line used for listing the previous schedule. In the case of the first schedule to be listed, only the column headings are covered. With the schedule in position, each entry is copied onto the listing sheet on the first line immediately below its position on the schedule.

This method minimizes errors due to the entry of an item in the wrong column or on the wrong line. Questionable figures are marked to call them to the attention of the "editor". Ordinarily each day's schedules are listed as received, so on August 3d or 4th when the report must be closed only schedules received

that day remain to be listed. It should be noted that whereas schedules for each county are listed separately, ordinarily with only one or a few counties to a listing sheet, the order in which schedules are listed within a county depends entirely upon the date of receipt. Alphabetical or geographic arrangement is not attempted.

On the closing date after all listing has been completed, either the State Statistician, or his assistants, or the chief clerk, "edits" the listing sheet. This means that he scans each column to make sure that none of the entries therein differs so much from the others as to indicate either a misunderstanding on the part of the reporter, or a misplaced entry on the schedule, or an error in listing. Even when no error of this sort appears to have been made, a report that is very different from the others from a given county may be deleted on the basis that it is unrepresentative. Most questionable entries are either deleted or moved into the appropriate columns, but some that are apparently not attributable to misunderstandings or mechanical errors may be left in to represent minority situations in a given county.

Editing is necessarily a rather subjective operation, but when done carefully by a technician who is thoroughly familiar with what is being reported, the geographical area involved, and the types of frequency distribution that can reasonably be expected, it is a safeguard against errors which otherwise almost certainly would occur.

After the listing sheets have been edited, the necessary additions, counts, and divisions, are made by the clerical force, and each operation is checked by a clerk other than the one who did the work. Next, the various district counts, totals, and averages are entered on district summary sheets, where unweighted and weighted State averages are computed. Appropriate predetermined weights are used for computing each weighted State average. From the district summaries, State counts and averages of all the items on the schedule except the yield per acre of corn, oats, and winter wheat, are copied onto a State summary form. This summary form is shaped like the schedule itself, but is printed on heavy pink paper and so is often called a "pink slip" or, more properly, a "statisticians' summary sheet." The yield data on these three grains are omitted from this summary because these yields are designated as speculative in certain States, including Illinois, and must therefore be reported on a separate form.

During the last few days of July and the first two days of August, two or more of the 5 statisticians in the Illinois office usually travel in the more important crop-producing sections of the State, or the sections where weather or insect damage is of potential but previously unknown significance. In the course of such travel, these statisticians make individual field observations and personally appraise the prospects of yield. They talk with interested and informed persons, such as operators of grain elevators, county agents, local dealers, and representatives of farm management services as well as farmers. Back in the office, they interpret the indications derived from the general schedule in the light of the statisticians' pooled observations and conversations.

By techniques which are discussed in later chapters a statistician's "recommendation" is made for each item required by the instructions, and these recommendations are entered on the statisticians' summary sheet, which is prepared in duplicate. Comments are written on special forms, using a separate sheet for each item or group of related items. The comments are general statements on the weather during the month and the effect of temperatures and precipitation on the production of crops, the production of milk and eggs, farm employment, and other items being estimated. Also included are statements about the progress of various crop operations, the state of maturity of unharvested crops, the statistician's appraisal of survey indications, and his interpretation of all available data.

When all the nonspeculative comments have been written, two copies of these comments, together with two statisticians' summary sheets and one copy of the district summary sheets are placed in a special envelope marked "C" addressed to the Crop Reporting Board in Washington, D. C. They are sent either by air mail or regular mail, but always by special delivery, in time to reach the Crop Reporting Board by the date and hour specified in the instructions—in this case 9 a.m. on August 6th.

Corn, oats, wheat, and cotton have been designated as speculative crops because of the large volume of futures trading in these commodities on the organized exchanges. Individual States in which the production of a given speculative crop is so great that forecasts or estimates of production for those States, either singly or in aggregate, are highly correlated with the country's total production, have been designated as speculative States for the crops in question; all other States are called nonspeculative with regard to that crop.

After the summaries and comments on nonspeculative crops have been mailed, the Illinois statisticians turn their attention to the State's three speculative items—yield per acre of corn, wheat, and oats. Counts are made, columns are added, and averages are computed, for each of the speculative crops, usually county-by-

county, just as was done for the nonspeculative items. A district summary sheet is prepared for the speculative items. Two copies of a form designated "Agricultural Statisticians' Speculative Report" (see Appendix E) are used for each of the speculative items; indications, recommendations, and comments are all entered on the same form. This time, however, a special "A" envelope (denoting speculative) addressed to the Secretary of Agriculture, is used. It is sent special delivery by air mail or regular mail, depending upon the time between posting in the State and the due date in Washington, which 10 a.m. on August 9th. This due date is the day before the date of the General Crop Report, so that receipt of the "A" envelopes may be checked, and State statisticians notified if their reports are not received on time.

PROCEDURES IN WASHINGTON

In Washington, D. C., work on the August report begins about the 1st of April. At that time the questions to be asked of farmers are decided upon, Budget Bureau approval of the General Schedule is obtained, and copy is prepared and sent to the Government Printing Office. Instructions for the August report are prepared and sent to the State offices immediately after the release of the preceding (July) report. These specify a due date which will allow the field offices as much time as practicable to prepare and submit their reports. Usually 4 days are required in Washington for review and preparation of the General Crop Report, including the release day on which the report is issued at 3 p.m.

Much preparatory work is necessary before the State reports begin to reach Washington. Commodity computation sheets are prepared, with headings and dates. These sheets have the names of the States printed in geographical order in the left margin and are ruled for the necessary computations. The acreages for harvest which were estimated in July are transferred to these sheets. Additional sheets are prepared showing estimates for past periods, such as last year and 10-year averages. All the necessary graphic charts and work sheets for each State are assembled in a folder labeled with the name of the State.

The Illinois report, as was mentioned earlier, had been mailed in two parts. The nonspeculative report was mailed in a Special "C" envelope addressed to the Crop Reporting Board. Upon its arrival, it was delivered to the office of the Secretary of the Crop Reporting Board. The statisticians' summary sheet is received in duplicate. One copy of this summary goes to the computing unit where the number of re-

ports, the sum (in some cases), the straight and weighted averages, and the statistician's recommendations are transferred to the commodity computation sheets. The statistician's recommendations are assumed to be acceptable to the board and necessary preliminary computations are made.

The remaining copy of the statisticians' summary, one copy of the comments, and any other pertinent materials are placed in a folder for Illinois. The nonspeculative items of the August crop report for Illinois are now ready for review by the board. This is done in two steps.

In the first, or State, review, a member of the Crop Reporting Board reads the statistician's comments and, using much the same techniques as followed by the statistician in Illinois, arrives at his own recommendation for each item. He enters his recommendations in the spaces provided on the statisticians' summary sheet. If for any item his recommendation does not agree with the State or field statistician's recommendation, he makes out a form, popularly called a "change slip", in duplicate, giving his reasons for not accepting the statistician's recommendation. After the reviewer completes the review of all items, he places all the materials, including any change slips, in the Illinois folder and returns it to the office of the Secretary of the Crop Reporting Board.

The comments, graphic charts, work sheets, and change slips (if any) for Illinois are sorted by commodities, as are the same materials for the other 47 States as each State review is completed. Computations on the commodity computation sheets are made in the computing unit while the State review is being made, and these sheets are placed with the other commodity materials in the commodity folders.

In the second phase of the nonspeculative review, which is called the commodity review, members of the Crop Reporting Board are assigned individual commodities to review. Commodity reviewers, working usually in pairs, take the folder containing the graphic charts, comments, change slips, and computation sheets for the particular commodities which have been assigned to them. Using the same techniques which were used in the State office and in the State review, they review the estimates for all States, approve or disapprove changes made by the State reviewer, and make other changes if they believe the data warrant them. If they disapprove changes made by the State reviewer or if they make other changes they discuss these with the board member concerned. All changes are then approved or disapproved by the Chairman of the Crop Reporting Board. The change slips and the computation sheets are returned to the computing unit. One copy

of each approved change slip is mailed to the field office concerned, and the other is used to record the change on the computation sheet. Necessary computations are made, including United States total production and yield. Comments on the nonspeculative commodities are prepared by board members for the report to be published.

In the meantime, the information regarding the speculative report which was mailed from the Illinois office in a Special "A" envelope addressed to the Secretary of Agriculture has been given special handling. Immediately upon its receipt in the Department of Agriculture post office, the envelope is delivered to the chief of the Secretary of Agriculture's records section, who has the responsibility of placing the report in a mail box that is secured by two locks and kept in a locked room. On top of the mail box is a check sheet bearing the names of the so-called "speculative states." When the Illinois report is deposited, that fact is recorded on this check sheet.

On the morning of the release of the report —about 6 o'clock or earlier—the chairman of the board, the secretary of the board (who has the key for one lock), one other board member, and a representative of the Secretary of Agriculture (who has the key for the other lock), go to the locked room accompanied by an armed guard. There they unlock the mail box and under guard take the Illinois report, along with reports from other speculative States, to the door of the second floor, fourth wing corridor, in the South Agriculture Building, where the guard locks the door after the chairman and secretary of the board and other board members have entered. The night before, the venetian blinds on all windows within this corridor have been lowered, closed, and sealed. No one may open or even adjust these blinds while the board is in session. All telephones in the wing have been disconnected, the door at the other end of the corridor is locked, and a guard is on duty outside. Until the appointed hour of release no one may leave the corridor, and only employees who carry special passes are allowed to enter. These are called the lock-up quarters.

Materials for each State are placed in a State folder, as with the nonspeculative section of the report. But instead of each State being reviewed by only two members of the board, each member of the board makes his own interpretation of the data for each of the speculative items for each of the States. The Secretary of the Crop Reporting Board records the recommendations of all members of the board on a separate summary sheet for each speculative item. The chairman reviews these recommendations and if members are in dis-

agreement concerning an item they discuss and review the situation until an agreement is reached or the chairman has exercised his authority to set the official estimate.

When forecasts or estimates have been adopted for all States for a given crop, they are handed to the computing unit. Here they are entered on the computation sheet, which already contains the data for the nonspeculative States. The necessary computations are made and national production and yield per acre are computed. After this, tables containing the data are stenciled and the board members write comments on the speculative commodities for which they are responsible. These comments are edited for accuracy and style and then stenciled. Mimeograph machines are brought into the quarters the night before so that the report can be processed inside the locked corridor. Finally, shortly before the time of release, the report is assembled.

The Secretary of Agriculture enters the lock-up quarters about 2:45 p.m., reviews the report, discusses it with the board members, and signs it, thus approving it for release. Two or three minutes before 3 p.m. the chairman and secretary of the board, accompanied by a few members, leave the lock-up quarters and proceed under guard to the release room, "looking neither to right nor left and speaking to no one nor acknowledging any greeting," according to regulations. In the release room, telephone and telegraph instruments already are connected with the outside world and the operators are assembled in a prescribed space, out of reach of the instruments.

When the chairman enters the release room he places one report, face down, beside each telephone and telegraph instrument. All persons present stand within a specified space. At precisely 3 p.m., by a Western Union clock on the wall, a representative of the Secretary of Agriculture says "Go" and the reporters from the newspapers, press services, and brokerage houses rush to their instruments and begin sending out the report. In each news room or brokerage office at the other end of the wire the receiver has a prepared skeleton of the face sheet of the report, so that only the numbers need to be transmitted. A few minutes later the newspapers containing the reports are available on the street.

At 3 p.m. the doors at either end of the corridor are thrown open, the blinds are unsealed, and the telephones are connected. A telegram is dispatched to each of the 41 State offices that has requested it, containing all changes in estimates from the statistician's recommendations for that particular State and all United States estimates. Mimeographed releases are mailed to all field offices. Releases

destined for distant offices by air mail are de-
livered to the Washington National Airport by
automobile.

FIELD PROCEDURES AFTER RELEASE

Remembering that this illustration of the
steps taken in issuing a routine report started
with Illinois, we note that upon receipt at
Springfield of the crop-report telegram on Au-
gust 10, a report is written containing the
highlights of the report for the State of Illinois.
This report is rushed to the press services and
all newspapers in the State. Later when the
mimeographed report is received from Wash-
ington, a somewhat expanded State report is
written, and then multilithed and mailed to
each of the general crop reporters in Illinois.

During the next week, a clerk takes all of
the general schedules of the month, sorts them
alphabetically within each county, and then
records on the permanent record card of each
reporter of the fact that an August 1 general
schedule was received from him. These cards
are filed alphabetically by county. A list of re-
porters who did not report in August may be
drawn off so that personal notes or a typed or
multilithed reminder slip may be enclosed with
the September general schedule when it is sent
to each of those who did not respond in Au-
gust. On the basis of the information on the
permanent record cards, the list of reporters is
culled once or twice a year by eliminating the
names of those who rarely report.

CHAPTER 5. METHODS OF OBTAINING INFORMATION AND OF ESTIMATING

By Walter A. Hendricks

INTRODUCTION

This chapter outlines in a general way the sources of information, sampling procedures, and methods of estimating that are currently in use. It is impracticable to condense into one chapter the detail required for a complete discussion of all of these points, as they relate to each one of the individual commodities and items covered by the entire estimating program. It is intended rather to present an over-all picture of these methods in order to illustrate their general nature. The application of these methods to specific estimating problems is described in later chapters. Miscellaneous methods devised to meet special problems of estimating in particular fields will be taken up in the chapters covering those fields.

Intentions, forecasts, and current estimates of agricultural production are based almost entirely on returns from voluntary mail sampling, interpreted by means of regression charts. Revised estimates of a few crops (cotton, tobacco, broomcorn, peanuts, sugar beets, and sugarcane) are made after the close of the marketing season and are published on scheduled dates from May to August. These revisions are based primarily on marketings, shipments, volume processed or handled, and other reasonably complete utilization data from private or Government sources.

Revised estimates of most other crops are based primarily on data from the annual Assessors' State Farm Censuses in the States in which the enumeration of acreage or production relates to the previous crop season and other check data which are available, although sometimes relatively incomplete. Revisions of estimates for these other crops are not published until the following December. Revisions of livestock inventory numbers are published in February, a year after the original estimates. Commercial check data, when used, include cotton ginnings, peanut millings, tobacco sales, reports from sugar-manufacturing companies, records of fruits and vegetables canned and processed, carlot shipments of fruits, vegetables, livestock and grain, records of numbers of livestock assessed for taxation, market receipts of livestock and other agricultural products, quantities of certain agricultural products processed for sale, plant receipts of milk and cream, plant production of manufactured dairy products, and State inspection records of livestock movements, slaughter, and inventory counts.

Every 5 years the United States Department of Commerce takes a Census of Agriculture. When data from this census become available, final revised estimates are made of acreage, yield, and production of crops, numbers of livestock, etc. These are primarily revisions of the levels of the annual estimates for the previous 5 or 6 years. Census data are adjusted for incompleteness when commercial or other check data are available. Census livestock inventory numbers as of April 1 are converted to a January 1 date on the basis of sample surveys and market receipts of livestock. The census data are especially useful in the case of those agricultural products for which commercial check data and other information are not adequate or not available, such as agricultural products that are mostly consumed on the farm or that are shipped primarily by motortruck rather than by rail.

SOURCES OF DATA

The sources of information upon which the forecasts and estimates are based are many and varied. The information is generally of two kinds: (1) Sample data and (2) presumably complete census or other complete enumeration data, as cotton ginnings, tobacco sales, quantities processed or shipped. The sample data are obtained from farmers or others in either of two ways (1) By means of a mailed questionnaire, called "voluntary mail sampling", or (2) by personal interview, sometimes using "preselected interview (or probability) sampling."

The latter method, which has been used more and more during the last few years, involves the hiring of interviewers who visit preselected sample farms and fill out the questionnaire in consultation with the farmer. This method of probability sampling has many advantages that are described later. But because of certain disadvantages, including high cost and relative slowness, the interview survey method has not been adopted for the making of forecasts or estimates of agricultural production. Methods of voluntary mail sampling predominate in the work of the organization. Voluntary mail sam-

pling, when combined with graphic regression methods of estimation, is an extremely useful and serviceable technique under the conditions that prevail in the United States.

In the use of voluntary mail sampling, farmers who are willing to cooperate are requested to supply information about crop acreages, crop yields and condition, farm livestock inventories, milk and egg production, farm employment and wages, and other items that are closely related to their farming and about which they have intimate knowledge. This information may relate (1) to agricultural conditions in the locality in which the farmer lives or (2) to the operation of his own farm. Data representing the first type of information are called "judgment-for-the-locality" observations. Data relating to the operation of the farmer's own farm are called "individual farm" observations. Data obtained in interview surveys of probability samples are limited to the individual farms.

Early in the history of the organization, when its staff was small and the number of schedules that could be handled each month was limited, each farmer in the sample was requested to supply information that would apply to all farms in his locality rather than to his farm alone. It was believed that this would have the effect of giving a more representative picture of changes in crop acreages, general level of crop yields, and other items, through an increased coverage at no increase in office work or expense. Experience indicates that a farmer's lack of exact information about the changes in acreages and livestock numbers on his neighbors' farms makes locality answers on those items relatively unreliable.

Voluntary mail samples fall into four general categories, the first three of which are what might be called general-purpose samples.

(1) *Regular monthly reporters* receive a general crop and livestock schedule the first of each month. The questions on these monthly questionnaires are predominantly of the judgment-for-the-locality type on crop and pasture conditions, yields per acre, farm wage rates, etc., but they also include individual farm observations on such items as the rate of milk and egg production, farm stocks (quarterly), farm employment. About a 30-percent return is obtained from this regular monthly-reporter list of about 80,000 farmers. Similarly, about 35,000 monthly price reporters receive questionnaires asking for information on prices which are currently being paid to farmers for major farm products. About 30 percent of the questionnaires are returned.

(2) *Direct-mail individual-farm reporters* receive crop-acreage questionnaires in March on intentions to plant, in June on crop acreages for harvest, and in the late fall on acreage harvested and on production. These questionnaires are sent to about 320,000 farmers. On the average, about 80,000 usable schedules or 25 percent are returned. In many States the regular monthly reporters are also included in these individual-farm inquiries. The individual farm reporter lists are also used for many special surveys.

(3) *The rural mail carriers* of the Post Office Department distribute about 600,000 unaddressed individual-farm questionnaire cards to farmers along their routes three times each year—in June and December on livestock and in October on crop acreages planted and harvested. About 160,000 cards or 27 percent are returned and tabulated.

(4) A fourth type of sampling, *"special-purpose" mail sampling,* is used in making forecasts and estimates of acreage, condition, yield and/or production of important commercial crops, numbers of livestock, and production of livestock products for which an adequate sample cannot be obtained by general-purpose sampling. Examples are commercial fruit, nut, and vegetable crops; such field crops as cotton, tobacco, dry beans, broomcorn, sugar beets, sugarcane, and seed crops, cattle and lambs on feed, sheep, cattle, and goats on ranches, wool and mohair produced, turkeys, broilers, nonfederally inspected slaughter of livestock, grain stocks in mills and elevators, chicks hatched, disposition of milk, rations fed to milk cows, and, in a few States, monthly egg and milk production. Mailing lists of these special producers and processors are maintained in the Agricultural Estimates field offices.

A population of agricultural producers that requires "special-purpose" sampling may have one or more of the following characteristics:

(1) The agricultural product is of considerable economic importance in a State or in the Nation. Usually it is one that is sold rather than consumed on the farm where grown.

(2) The number of producers is usually small compared with all agricultural producers in a State, so the frequency of occurrences is low. For example, only 2.4 percent of the farms in Montana reported dry beans in the 1945 Federal Census.

(3) A high proportion of the total production may be produced by a relatively small number of the larger growers. For example, in New England less than 10 percent of the farms on which chickens are raised have more than 70 percent of the hens and produce more than 70 percent of the eggs; in North Dakota 1.1 percent of all farmers (4.7 percent of all farmers growing potatoes) produced 86 percent of the State's potato crop in 1944.

(4) The production may be geographically

concentrated in one or a few areas because of special soil, climatic, or marketing requirements of these agricultural products.

(5) Some of these agricultural specialties have a sporadic geographic distribution, and a few are sporadic both geographically and chronologically, as in-and-out cattle and lamb feeders, producers of certain commercial vegetable crops in some States, and producers of such seed crops as clover and bluegrass.

The general crop reporters occupy a unique position in the work of the organization. Historically, this group originally represented the principal source of current information about agriculture at its grass roots. They were, and still are, selected not so much on the basis of a mathematical sampling plan as on the basis of their ability to appraise agricultural conditions in their communities. They serve without pay, but the close personal relationship that has developed between them and the State Statisticians over the years makes them feel that they are members of the official family. This relationship is one of the most pleasant traditions of the Crop Reporting Service. Although the goal is not always reached in practice, an attempt is made to obtain the services of at least one general crop reporter in every agricultural township in the United States.

Valuable data are also obtained through private and governmental agencies and trade associations by cooperative agreement or through informal exchange of information. The data obtained from the United States Census of Agriculture, State farm censuses, fruit growers' associations, agencies that finance farmers' operations, railroads, irrigation projects, and the other private and governmental agencies that serve agriculture fall into this category. Such data strengthen the estimating program by verifying or refuting, as the case may be, the indications obtained from voluntary mail samples. Details of the way in which such check data are used are described later.

Factors other than mathematical principles of sampling have always determined the composition of the general crop reporter list. When the first such list was established, there was no theory of sampling as it exists today. Emphasis was placed upon getting the services of a corps of intelligent and well-informed persons who would be distributed fairly uniformly over the agricultural areas of the country, and who would report regularly. Much the same viewpoint is held today. The general crop reporters thus represent a group of farmers and others in close contact with farming activities in their communities, who have better than average judgment and information. As these reporters are expected to report on many general subjects, it would be virtually impossible

to devise a system of allocating the number of reporters to the various parts of the country in such a way as to obtain an optimum allocation for all subjects as a whole. About all that can be done is to set up a geographic distribution of reporters within a State that is roughly proportional to the number of farms.

Other mailing lists of farmers that have been developed have usually been designed to get reports on some specific subject, as cotton production, citrus fruit production, or some other specialized farming activity or characteristic. Originally, such lists were usually derived by sorting out the names of farmers engaged in specific operations, or having a specified type of farm, from the best master list of farmers available for the State. So far as possible, attempts were made to select those names in such a way that the number of reporters in every county or crop reporting district would be approximately proportional to the weight that the county or district carried in the State estimate. This was achieved by making the number of farmers selected from each geographic subdivision of the State proportional to the total number of such farms, to the census totals of the items to be estimated, or to some similar measure. Fundamentally, the same plan is still followed, although improvements have been made gradually as better master lists and more detailed information about the characteristics of the farms operated by the individuals on that list have become available.

SOURCES OF MAILING LISTS

In the early years, the names of farmers who might be prospective reporters were obtained by writing to postmasters or other key individuals in different parts of the State, or through contacts made by the statisticians. More recently the development of Annual State Farm Censuses, conducted in each of 14 States by local assessment officials in cooperation with the State Statisticians, has provided excellent master lists of names in those States.

The States having an annual farm census are largely concentrated in the important farming areas of the Middle West, and as the State census is taken every year, the list is kept up to date. In States that do not have such an annual census other sources of lists must be utilized. County agents are a valuable source of names. The lists of farmers assembled in course of the production control and conservation programs of the Department of Agriculture were often found to be extremely useful, particularly in the South where most farmers were participating in these programs and practically all farms were on the lists. In many States, the lists of farms participating in those programs are still kept up to date by State ad-

ministrative officials and are used by State Statisticians.

The rural mail carrier surveys supply one of the most widely used sources of new names. A particularly useful source of names for mailing lists is provided by the membership directories maintained by trade organizations of various kinds. These directories provide names of producers of specialized commodities. The lists of members of fruit-growers' associations, poultry-improvement associations, and the like fall into this category. State license and inspection records and similar material are also used in many cases as sources of names, particularly in the case of manufacturing and processing plants.

The interview surveys conducted by the so-called "area" sampling method in recent years have provided lists of names of farmers who were interviewed during those surveys. These lists have been useful for mail surveys at the national level, but to date the interview surveys have been conducted on too small a scale to provide very large lists of names for individual States.

Mailing lists derived from enumerative surveys yield a somewhat higher percentage return of schedules than do mailing lists of individuals who have not been questioned before. For this reason, and for other reasons that are discussed later, such mailing lists have much to recommend them. On one occasion names and addresses of farmers were obtained from the United States Census of Agriculture; that approach has not been used to any great extent.

SELECTION OF SAMPLES FOR INTERVIEW SURVEYS

When data are collected by interview rather than by mail the problem of selecting a sample arises. A sample of farms, dealers, or manufacturing plants can be selected from a master list just as for a mail survey. The only difference would be that an interviewer would be sent to visit the individuals concerned, to get the information by personal interview instead of by mail. This method of selecting a sample is practicable when a sample of individuals engaged in some highly specialized type of operation is desired and is often used in such specialized investigations.

For a general-purpose sample of farms, an area sample consisting of small segments of area, chosen from a map that has been completely subdivided into a large number of such areas, has been found to be more practicable than a sample drawn from a list, primarily because of the lesser travel required, and the lack of complete, up-to-date lists of farmers. An interviewer visits each of the selected segments, and all farms having headquarters within those

segments are included in the sample. This makes it unnecessary to have a list of farmers' names and addresses for selecting the sample or making estimates from the data. This procedure actually makes it possible to estimate the number of farms present in the universe of inquiry.

It has been found that advance information about the number of farms in the universe and their characteristics is valuable, even though the area method of sampling is used. When such information is at hand, the sample area segments can be chosen in such a way as to provide a more efficient sample and more accurate estimates can be derived from the survey.

OBJECTIVE COUNTS AND MEASUREMENTS

Objective methods have been used to measure crop acreages and crop yields, and factors associated with yields, such as soil moisture. An interesting device for measuring crop acreages, known as the crop meter, was developed during the 1920's. It is a multidialed instrument which is attached to the speedometer cable of an automobile. A separate push button controls each dial, and a dial is ordinarily designated for each crop.

The frontage of each crop along the highway being traveled is measured by depressing an appropriate button at the beginning of each field, releasing that button and pressing another whenever there is a change in the crop or land use fronting the road. A master dial cumulates the total mileage traveled. The ratio of each crop's frontage to the total mileage can be computed and compared with the ratios for the previous year to obtain an indication of change. Ordinarily the same route is traveled year after year, so it is possible to calculate directly from the measured frontage of a given crop in successive years a percentage change in frontage which serves as an indication of acreage change.

Objective measurements of yields or plant characteristics associated with yields have been made in recent years. The most comprehensive surveys of this kind were made on wheat [4, 5] in the principal wheat-producing States in 1939 and 1940. A comprehensive set of routes was laid out in each of these States and crews of samplers drove over those routes with crop meters attached to their automobiles to meas-

[4] King, A. J., and Jebe, E. H. An experiment in preharvest sampling of wheat fields, Iowa Agr. Expt. Sta. Research Bull. 273, 1940.

[5] King, A. J., McCarty, D. E., and McPeek, Miles. An objective method of sampling wheat fields to estimate production and quality of wheat, U. S. Dept. Agr. Tech. Bull. 814, 1942.

ure the wheat frontages. At systematically spaced intervals of wheat frontage that yielded a self-weighted sample, wheat fields were selected and entered at random points to random depths (within certain limits) and small measured areas of grain were cut. These were sent to a central laboratory for determinations of variety, moisture, quality, yield, and other pertinent information. On a more limited scale similar surveys of yields of corn were made for several years before the war. Such a survey was also conducted for soybeans in 1941 in Illinois.

Indications of prospective yields of cotton are obtained by a similar method in some of the Southern States. Such variables as boll numbers, boll size, and other factors highly correlated with yield are measured, and an estimate of the yield per acre is obtained by reference to charts which show the relation of the measurements to final yields.

In addition to these so-called route samples, a method of using area samples has been developed, in which fields are selected at random from area segments of the kind used in the modern interview surveys. This approach was used in a 1948 survey designed to measure yields of corn in Alabama.

The possibilities of using observations on weather data and soil moisture to forecast and estimate crop yields have been investigated. The results are discussed under Forecasts of Yield and Production in Chapter 7.

TECHNICAL CONSIDERATIONS IN SAMPLING

Many technical principles are involved in drawing samples of farms or other kinds of units, the specific problems of which will vary according to the nature of the survey. Statisticians now have available a large fund of knowledge concerning these technical principles. Many of the specific applications have been developed more or less parallel to the development of calculating and tabulating machines, but most of the basic concepts have been known for years. Recent studies, however, have led to new specific methods, techniques, and applications, by which older methods of collecting information can be utilized more efficiently.

STRATIFICATION

The oldest and perhaps most widely used device for reducing the sampling error in an estimate involves subdividing the universe to be sampled into a number of parts called strata, and then controlling the sampling in such a way that each stratum is represented in the sample in its proper proportion. To be effective, the strata should be formed in such a way that the individuals in any one stratum are as sim-

ilar as possible with respect to the characteristic or item that is to be estimated from the sample. As a practical matter, the amount of stratifying that can be done is often limited by the amount of advance information that is available about the characteristics of the universe.

It has long been obvious that farms tend to differ from one part of a State to another; consequently a geographic stratification was adopted long ago and is still in use. Every State is subdivided into Crop Reporting Districts, the boundaries of which tend to follow lines of demarcation between differences in farm characteristics, but do not cut across individual counties. The general pattern calls for nine such districts per State, but the number is smaller in some States and slightly larger in others. These districts have been used for many years for all major farm surveys conducted by Agricultural Estimates. A similar set of Price Reporting Districts, the boundaries of which ordinarily but not always coincide with those of the Crop Reporting Districts, has also been used for years when returns from retail stores and handlers of agricultural products are summarized. This allows for regional differences within a State in prices the merchants charge farmers for things they buy and the prices they pay farmers for farm products.

Stratifications of this kind are fairly easy to work out and use. In drawing samples of processing plants or samples of farms for some special types of estimates, a stratification based on the scale of operations of every individual in the universe is sometimes used. This method has been particularly efficient for selecting samples of storage, processing, and manufacturing plants, because data are usually available to permit the classification of all plants in the universe into size groups. Rated storage capacity is used as the measure of size for mills and elevators and volume of output during a specified base period is used as a measure of size for processing and manufacturing plants.

Theoretically the same principle could be applied in stratifying farms on the basis of size, where information about land in farms, production of a specified commodity during a base period, or some other pertinent characteristic may be used as the measure of size. But the number of individual farm records that would have to be handled in such an operation is generally so large that the procedure is impracticable with existing facilities, even when the necessary data for individual farms are available. As a practical matter, this kind of stratification can now be applied to selecting samples of farms only in cases where the universe to be sampled is restricted to farms in a comparatively small area or of some specialized

type, so that the total number of individual farm records that need to be handled is small enough to be manageable.

One of the biggest difficulties involved in establishing a satisfactory sampling program is that complete, up-to-date lists of farms that are producing specialty crops or livestock items are seldom available. Consequently much effort is spent in getting in contact with a large number of farms, selected from a more general list, that do not have the item or characteristic under study, whereas some farms that should have been included may be missed completely. Progress has been made in setting up special lists of farms on the basis of information obtained from rural-carrier acreage and livestock cards, assessors' censuses, and interview surveys.

The problem of selecting individual sampling units within strata has been the subject of considerable study and discussion. According to mathematical sampling theory, individual units should be selected from every stratum by a process such that the probability of selection is known for every unit present in the stratum. In ordinary random sampling within strata, this reduces to the requirement that, if n units are to be selected from a stratum, every possible combination of n that can be formed in the stratum must have an equal chance of being selected. This requirement is met if units are selected one at a time until a total of n is reached, provided every individual unit remaining in the universe at any time has an equal chance of being selected on each draw.

For several reasons this method has rarely been followed exactly. First of all, the facilities and materials for practical application of the procedures are ordinarily not available. Second, the process would be very expensive. Third, as there is always a considerable degree of nonresponse to a mail survey, it was thought to be unwise to spend much time and effort in setting up this type of mailing list so long as the incompleteness in the returns might lead to biased indications anyway. Fourth, the methods of estimating that are in current use seem to work well for the kinds of estimates being made, so long as there is comparability from one sample to the next. It has seemed better to do the sampling job in such a way that biases in successive samples remain relatively constant and sampling variations are kept low, rather than to strive for random samples which might be unbiased from the theoretical viewpoint, but which might be subject to large sampling errors.

Some mailing lists now used, as the general crop reporter lists, are clearly not fully representative of the universes to which the estimates derived from the data are supposed to apply. Neither are the rural-carrier samples. However, they will continue to be used until the facilities of the organization can be expanded. The methods of estimating applied to the data from these samples, and the nature of the estimates themselves, are such that reasonably accurate results generally are obtained in spite of the deficiencies in sample design.

On the other hand, such samples have definite weaknesses. When supplementary data are not sufficient to allow an appraisal of the extent of possible biases, there is no way of knowing how much error may actually be present in the estimates. This does not mean that the errors in the estimates are necessarily large, but it does mean that there is uncertainty about the size of the errors. Furthermore, the biases which generally are present may not remain constant in the future, even though they have appeared to be constant for a long time. Therefore, a correction factor obtained from past experience may be seriously misleading when it is used to adjust current data. This kind of situation is particularly likely to arise during periods of rapid change, because the more-or-less select group that constitutes the sample generally reacts differently to such changes than does the universe as a whole.

This point is developed more fully in the next section. New methods are being developed from time to time for dealing with nonresponse selectivity in mailed surveys. These methods, if used with a properly selected sample, should enable statisticians to make unbiased estimates with calculable precision from mail surveys. The problem of transition to the exclusive use of such samples, however, is a difficult process, similar in many respects to that of retooling an industrial plant. Gradual changes are being made as facilities and the current work load permit.

The application of probability sampling is subject to many variations and modifications, depending upon specific circumstances. One interesting application consists in selecting individuals with characteristics that are highly correlated with the items to be estimated.

This differs from ordinary random sampling in which every individual has an equal chance of being selected. This method is called "sampling with probabilities proportional to size of unit." "Size of unit" here refers to the numerical value of the particular characteristic that is being used as the control; it is *not* restricted to size in the physical sense alone, although the physical size of the unit may at times be the pertinent characteristic that is used for this purpose.

The principle involved is fairly simple. For example, in selecting a sample of mills and elevators for making periodic estimates of

wheat stocks, the universe can first be stratified geographically to make sure that all areas are represented in the sample. Because a large plant has more effect on the total stocks than a small plant, the sampling process is controlled in such a way that large plants have a heavy representation in the sample. A simple method of arriving at such a sample is to select all the big plants deliberately and to confine the random selection process to the remainder. This is, in fact, a procedure that is used in cases in which sufficient information about the universe is not available to permit further refinements, or when a few plants have nearly all of the storage capacity, or when further refinements would require more work than the office can handle.

A more refined approach, which is sometimes used when facilities permit, involves the stratification of establishments on the basis of size and random selection from each size group. The number of establishments to be selected from each size group is controlled so that each group is represented in the sample in its correct proportion for maximum precision, just as in any ordinary problem in stratified sampling.

Sometimes the variation in size of the establishments is such that grouping into strata on the basis of size is awkward and rather ineffective. There may be so few establishments similar in size that it is difficult to decide on a grouping, and, no matter what grouping is finally adopted, the variability within groups may be so large that sampling error is not controlled effectively by the stratification. Under such conditions, random selection of establishments with probabilities proportional to size, rather than with equal probabilities, is effective.

In such cases, instead of grouping all establishments into strata on the basis of size, no grouping is attempted at all. The sample of establishments is selected from the original list as it stands, but every one is given a probability of selection proportional to its size. Thus, if an establishment on the list is 10 times as large as the smallest, it will have 10 chances of being selected for every chance that the smallest has of being chosen. In a sample drawn by selecting establishments one at a time by this method, it is obvious that the larger establishments will tend to be heavily represented. This is just what is needed, as the larger plants in the universe have the greatest effect on the quantity to be estimated from the sample. In fact, this process has about the same effect as an efficient size-group stratification, with higher sampling rates applied to the groups containing the larger plants.

When dealing with stratified samples in which different sampling rates are used in the individual strata, the complete sample is not self-weighted; weights have to be applied to the individual stratum averages obtained from such samples. Similarly, when individual establishments are selected with probabilities proportional to size, weights must be applied to the data obtained from each sampling unit in the sample to take account of the differences in the probability of selection at the time the sample was drawn. As these weights bear a simple relationship to the probability of selection, they do not unduly complicate the analysis of the data.

AREA SAMPLES

At present, one of the most complicated sample designs used by the organization is employed in interview farm surveys. Such samples consist of small segments of land outlined on maps rather than names and addresses selected from a master list. Such sample segments have been selected in each of the 3,070 counties of the United States, as a cooperative project of the Bureau of Agricultural Economics, Bureau of the Census, and Iowa State College. They constitute what is now known as the Master Sample, and were chosen so that they represent a 1/18 cross-section of the total land area of the country. They thus include 1/18 of the total number of farms (about 300,000) and 1/18 of the total farm land.

The areas of these individual segments vary in size from one part of the country to another. The density of farms and the presence or absence of clearly identifiable boundaries were the main considerations in determining the size of segments. In general, an effort was made to control segment size in such a way that all individual segments would contain about the same number of farms. Areas containing many farms close together thus were subdivided into many small segments, whereas areas containing few farms were subdivided into smaller numbers of large segments. Whatever the size of the segments, the sampling rate was 1 in 18 throughout. The largest segments are in Nevada (108 square miles on the average) and the smallest in Indiana (0.71 square miles on the average). Aerial photographs and county highway maps showing the location of farms were available for most of the United States to permit this control of the sampling process.

Before selecting the segments for the sample, three separate strata were established. These consisted of (1) incorporated areas, (2) densely populated unincorporated areas such as unincorporated villages and settlements having an estimated population of 100 or more, or any other areas which seemed to have a

population density of 100 or more persons per square mile, and (3) open country. The open-country stratum contains 96 percent of the total land area and 91 percent of the farms as defined by the Census Bureau. Within each stratum, the sample segments were selected systematically by taking every eighteenth segment in a numbered sequence, with a random starting point in every county. The numbered sequence was obtained by counting back and forth across county maps in such a way that every township, or comparable minor civil division as defined by the Bureau of the Census, was sampled at the same rate. The boundaries of the segments had been previously set up, subject to the restriction that none would cross the boundaries of the minor civil divisions. This restriction was imposed primarily to keep the sample consistent with the Census Bureau practice of recording data by minor civil divisions.

The Master Sample segments are shown on maps that have been prepared for easy reproduction, and a complete file of working materials used in drawing the sample has been set up to permit drawing additional sample segments as needed. All of this material provides an excellent framework for designing samples for interview surveys of farms and both farm and nonfarm households.

A sample survey covering a representative sample of farms in every county of the United States is a large undertaking. The only such survey that has as yet been conducted was made as a supplement to the 1945 Census of Agriculture. During the taking of that census the Bureau of the Census made separate listings of data for the farms in all of the Master Sample segments, and obtained considerable additional data about those farms on a special questionnaire. All other interview surveys have been on a much more modest scale. They have been either (1) special surveys conducted in limited areas of the country or (2) Nation-wide surveys based on the subsampling principle in which a sample of from 100 to 800 counties is first selected and a limited number of segments is selected in those counties only.

In these surveys the counties were usually chosen on the basis of a farm-type stratification of the country. A random selection of counties was made from each stratum, either with equal probabilities or with probabilities proportional to a size characteristic. The size characteristic used was the number of farms in the county, the total acreage of a specified crop or group of crops, number of farm workers, or some similar item that was correlated with the subject matter of the survey and seemed to be useful from the standpoint of controlling sampling errors.

ESTIMATING PROCEDURES AND PROBLEMS

After a survey has been made and the raw data have been tabulated, the statistician prepares the desired estimates. These estimates are the end-product. How accurate they are usually depends upon the design and size of the sample itself, the accuracy with which the data for the individual sampling units have been obtained, and the adequacy of the methods used in deriving the estimates from the raw data.

The choice of a method for translating survey data into an estimate involves technical considerations. Generally, more than one method is available and the problem is to choose the particular one that will give best results under the given conditions. Since many of the samples used are selective, the methods of estimation have to be such that, so far as possible, the effects of the selectivity are removed from the final estimates. It often happens that the methods that are most effective for this purpose are also the methods that give most accurate results when applied to data from nonselective samples.

One of the simplest devices for translating sample data into an estimate, and the method most generally used by Agricultural Estimates, is to prepare a chart from past data showing the relationship between sample indications and corresponding "true values" of the quantities estimated, that is, the final revised estimates. Such a chart can then be used to estimate the most probable value of the quantity to be estimated when only a sample indication is at hand. Ordinarily, results from complete census enumerations or some other independent source provide the basis, at least in census years, for the final revised estimate with which sample data relating to the same date or period are to be compared. Figure 3 is an example of such a chart, relating to Kansas.

Every June the State Statistician in Kansas receives reports from about 2,500 or more farmers giving the total acres of farm land and the total acres of wheat harvested (or to be harvested) on each of those farms that year. For each Crop Reporting District the sample total wheat acreage is divided by the sample total farm-land acreage and multiplied by 100, to express the reported wheat acreage as a percentage of the farm-land acreage. These district "ratios to land" are then combined into a weighted State average percentage ratio in which the most recent data available on the total farm land in each district are used as weights. These weighted State average ratios are shown on the horizontal axis of the chart. On the vertical axis are shown the total acreages of wheat harvested in the State in the different years. The dots on the charts show
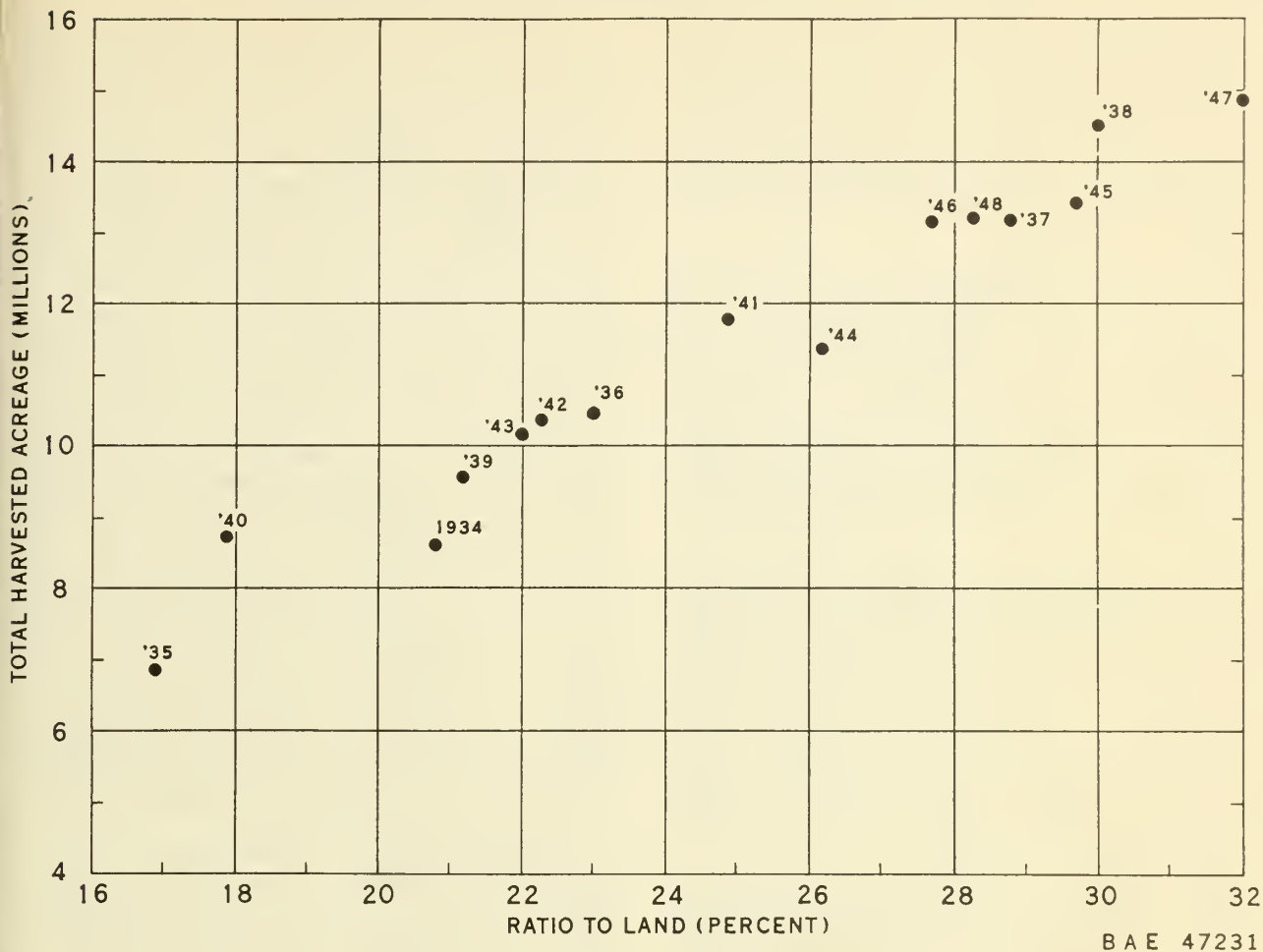
FIGURE 3.—Relationship between Kansas harvested wheat acreage and percentage of all farm land in sample, reported as harvested for wheat from June Acreage Survey.

the relation between the ratio to land, computed from the sample data, and the State wheat acreage for each of the years 1934-48. The wheat acreages shown for individual years are the most accurate estimates of those quantities that are available, and are based on evidence supplied by the surveys made each year, by later complete enumerations made by the local State farm census organization every year, and by the Census Bureau every 5 years, together with a variety of related information on production, stocks, and marketings.

Such a chart furnishes one of the indications used early in July when making a current estimate of acreage for harvest. For example, suppose that the "ratio to land" for a current year has a value of 31 percent. The statistician would estimate the State acreage corresponding to that figure as follows:

He would place a transparent ruler with a hair line on the chart and move it about until the hair line down the center of the ruler seemed best to represent the relationship between acreage and "ratio to land" in recent years. Each dot on the chart is marked to indicate the year to which it refers, so the statistician can make allowance for any time trend that may be present in the relationship, or special circumstances that might have affected the relationship in any individual year. On this particular chart no such trend seems to be in evidence and most statisticians would read the State acreage corresponding to a "ratio to land" of 31 percent at about 14.5 million acres.

There is an element of subjectivity in this method of reading the chart that some statisticians regard as objectionable. They would prefer to fit a regression line to the data by recognized mathematical methods and to use this regression line for estimating purposes. Such a procedure would eliminate differences in chart readings made by different individuals

and would thus reduce the subjective element in the estimates. But, considerable subjectivity is involved in deciding upon the mathematical form of the equation to be fitted to the data and in the editing of the raw data before the "ratio to land" is computed. Therefore, complete objectivity is not attained through the use of a mathematically fitted regression line or curve alone.

The flexibility of the graphic method—due to the fact that the statisticians can give more weight to recent or comparable years and less weight to distant or unlike years—is a great advantage. Such tests as have been made indicate that the average precision of the estimates over a period of time is approximately the same by either method, and that the choice between the two should be governed mainly by the relative time and effort required to apply them.

The time element is important in the estimating processes used, because of the very large number of estimates that have to be prepared in the short interval between the collection of the raw data and the publication of the results. If the estimates are to serve their purpose to the fullest extent they must be made available soon after the dates to which they apply. So the procedures must be those that can be applied rapidly. Graphic methods are used extensively because of the speed with which they can be applied.

Many factors affect the reliability of an estimate derived from such charts as figure 3. First it is necessary to evaluate the precision of the State acreage data that are given here as the "true values" for the years 1934-48. In this particular case the data are substantiated by annual State farm census enumerations, the regular Census of Agriculture taken every 5 years, and a variety of other data relating to the wheat crop for each year. But there is great variation in the volume of such available supporting evidence, from one crop to another and from one State to another. Any lack of precision in the data used to represent the true values in the chart will clearly introduce corresponding errors in estimates derived from reading the chart.

Another point to keep in mind is the nature of the sample data used to compute the "ratio to land." If the ratios for past years used when constructing the chart are based on selective data, the ratio used to make a current estimate must be subject to the same kind and degree of selectivity if the regression method is to give the most accurate results. In other words, comparability must be maintained between the sample data appearing on the chart and the sample data used to make a current estimate.

In reading the chart it is assumed that the total acreage of farm land in the State is the same at the time of the estimate as during the period covered by the data on the chart. Sometimes charts are found in which the dots show a progressive change in level from year to year. Such a trend may be caused by changes in the kind or degree of selectivity in the sample data, or by changes in the total acreage of land in farms in the State. If such trends are apparent during the period covered by the data on the chart, it is necessary to project them into the period to be covered by the current estimates. Generally this can be done successfully, but there is always the possibility of error in assuming that a trend observed in past years will continue in the same general direction. Regardless of the estimating methods employed, the element of subjectivity cannot be eliminated completely when such trends are projected. A statistician has to make the best interpretation of the data that he can in the light of experience and the current situation. When more data become available from the Census of Agriculture or other sources, each estimate is reviewed and, if necessary, is revised to bring it into line with the new indications. Examples of the kind of situation with which the statistician is frequently confronted and of the methods sometimes used are shown in figures 4, 5, and 6.

Figure 4 shows the relation between the acreage of soybeans grown alone in Illinois and the sample "ratio to land" from the September rural mail carrier survey. Although the chart shows a close relation between the State acreages and the sample indications for the years 1929-48, there are systematic deviations from the best-fitting straight line that can be drawn through the data. The line was located by inspection as is actually done currently.

Both the State acreages and the sample indications show large increases over the 20-year period, so it is reasonable to assume that the departures from linearity in the chart are caused by a failure of the time trend in the "ratios to land" to match the time trend in the State acreages of soybeans. The deviations (or residuals) from the line should not be plotted against the number of the year itself to learn how much allowance needs to be made for that factor. Such a procedure would not give the net effect because part of the time factor has already been taken into account in figure 4. The need is to plot the deviations from the line in that chart against only that part of the time factor that is not correlated with the "ratio to land." To find that part, the number of the year is plotted against the "ratio to land" in a second chart and the vertical deviations of the individual points from the best
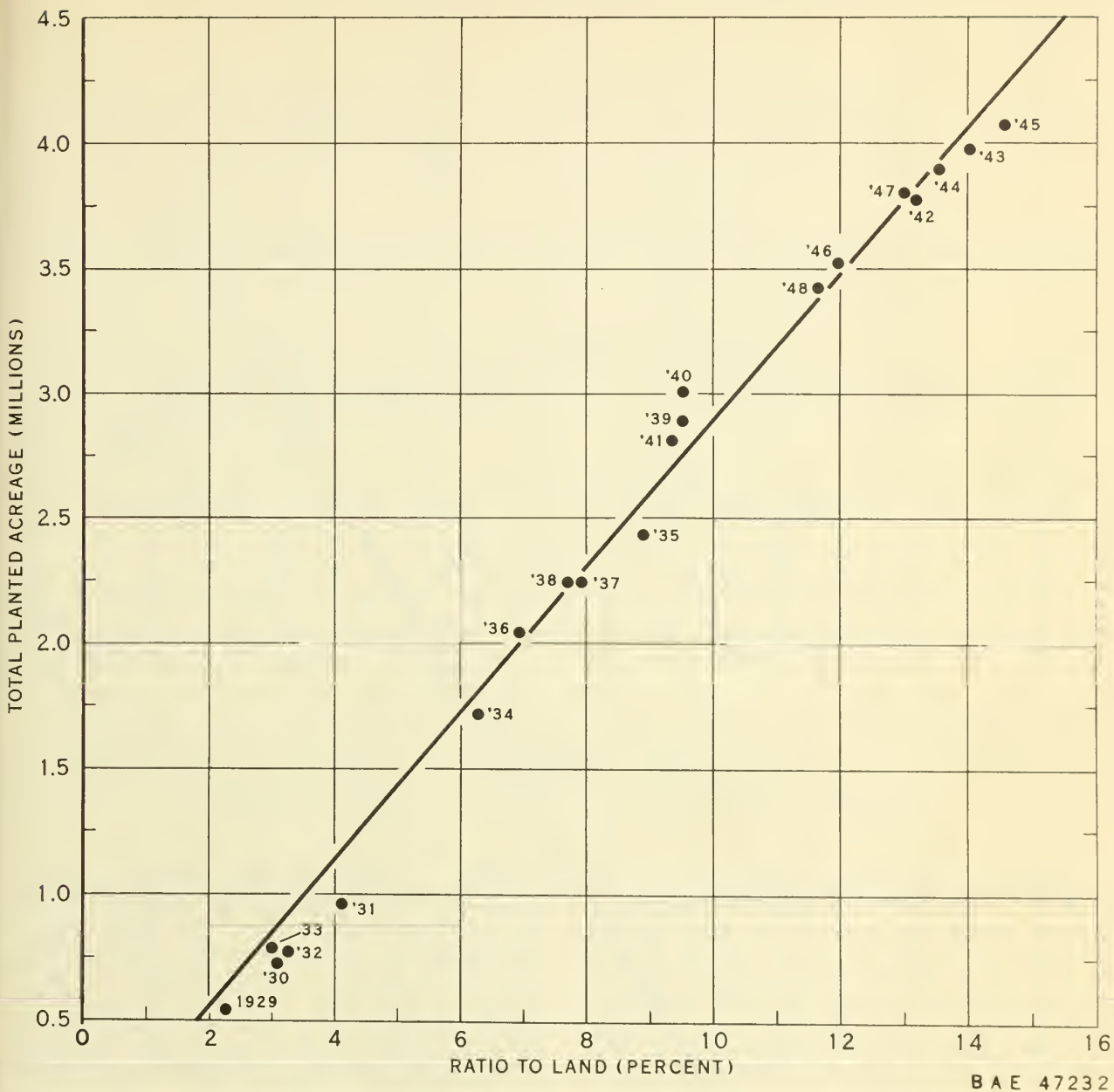
FIGURE 4.—Relationship between Illinois soybean acreage (planted acres, soybeans grown alone) and percentage of land in sample reported as planted in the September Rural Carrier Survey.

fitting line are measured. Those deviations represent the amounts by which the time factor is not correlated with the "ratios to land" for individual years. The true net allowance that must be made for time trends in estimating the soybean acreage is then represented by the best fitting line drawn on a chart in which the deviations from the line in figure 4 are plotted against the deviations from the line in figure 5. This line is shown in figure 6.

The use of such charts may be illustrated

by the following example. Suppose that in 1949 the ratio of soybean acreage to farm land is 15.0 percent. Reading on the line in figure 4, the estimate of acreage, unadjusted for time trend, would be about 4.34 million acres. The year 1949 corresponds to year number 21 on figure 5, but the line on this chart gives a reading of 20.50. This means that the "ratio to land" has already picked up the true effect corresponding to this figure on figure 4, and the only additional allowance that still needs to be
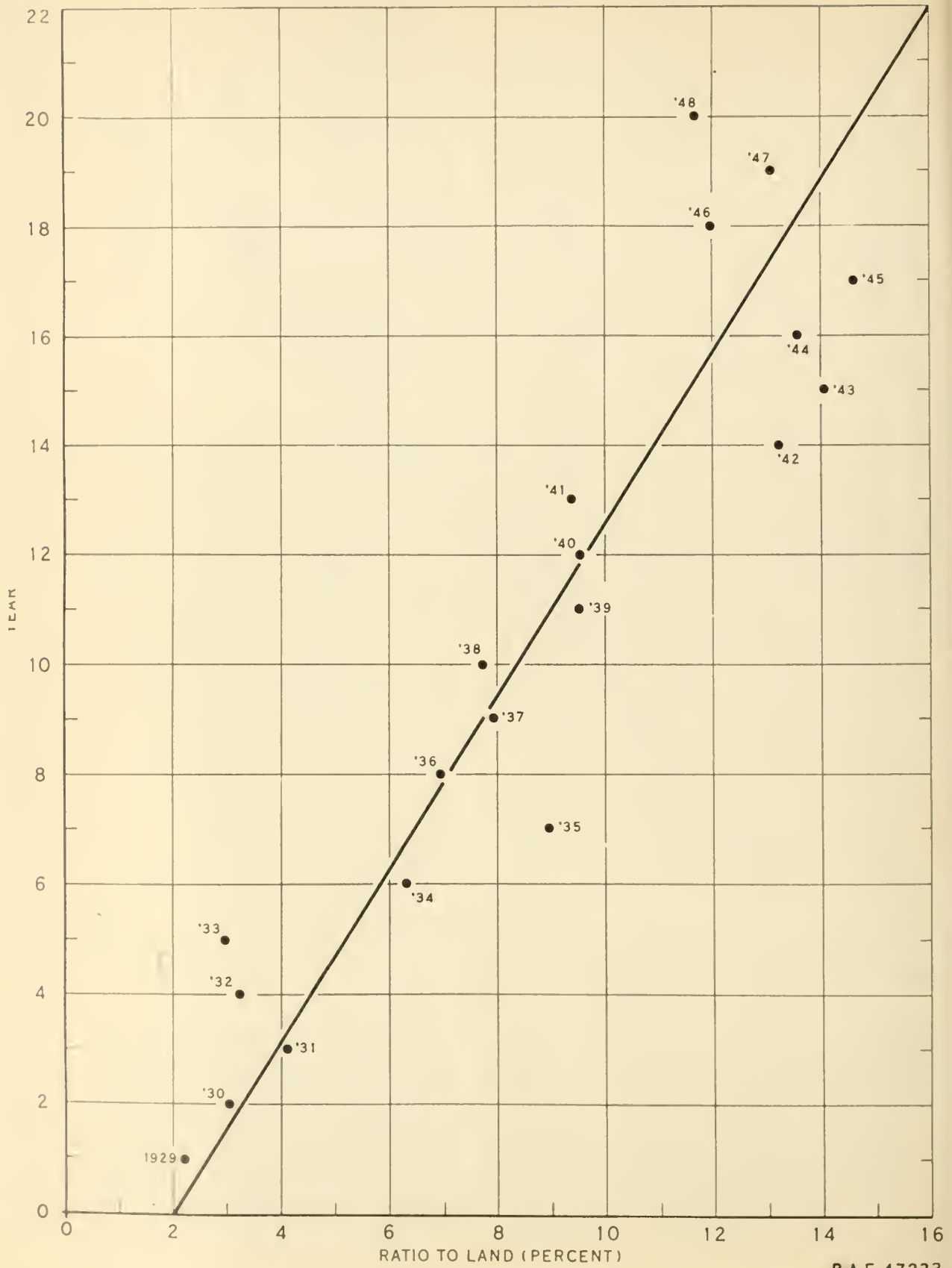
BAE 47233

FIGURE 5. Degree to which the time factor is correlated with the percentage of land in sample reported as planted to soybeans alone.
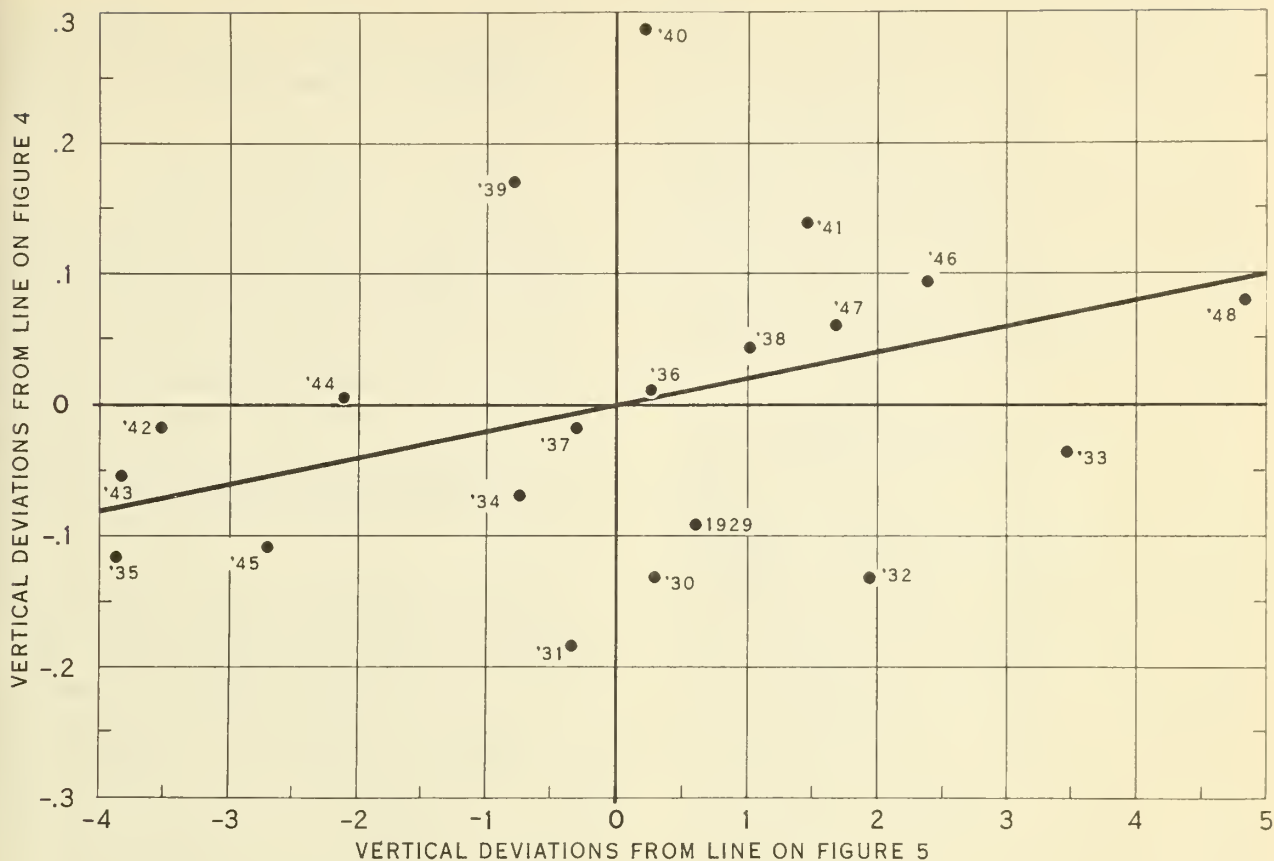
FIGURE 6.—Net effect of time trend not reflected in sample indication.

made is for the difference 21.00 — 20.50 = +0.50. Reading on the line of best fit in figure 6 it is found that the acreage increment corresponding to this amount is + 0.01 million acres. The 1949 soybean acreage would then be estimated at 4.34 + 0.01 = 4.35 million acres. If there had been no correlation between time and "ratio to land," the deviations from the line in figure 4 could have been plotted against time directly, without the use of intermediate figure 5. But here the use of the intermediate chart is clearly necessary.

A subjective element is involved in following this procedure. If the belief is correct that the additional adjustment for time trend was needed because of a failure in the "ratio to land" indication to keep pace with the rapid expansion of acreage of soybeans in the State, it is also reasonable to guess that the adjustment should stabilize at a constant value whenever the State acreage tends to stabilize at a more or less constant level. Apparently the period of expansion in the total soybean acreage has already been passed, in Illinois. Hence it might

be more logical to add a constant amount to readings from figure 4 in 1949 and future years, rather than to add the increasing amounts called for by figure 6. Which of these two ways is actually correct cannot be definitely ascertained until the behavior of estimates computed by both methods can be studied in relation to State assessors' and United States census data that become available at a later date.

CHOICE OF A SAMPLE INDICATION

The choice of a sample indication is also important in the construction of such charts. The "ratio to land" indication in the charts described above was originally introduced because expressing the individual crop acreages reported in the sample as a percentage of the farm land reported was, in many cases, an effective device for reducing the effects of sampling error in the average farm size, as well as for eliminating effects of selectivity in the sample.

It was observed that reported acreages of

most individual crops tended to be at least roughly proportional to the farm land reported in the sample; also, that the ratio of a reported crop acreage to reported farm land had about the same value as the true average ratio for the State as a whole, as ascertained by the censuses, regardless of whether the average size of the farms in the sample was approximately equal to the State average size of farm. It has become increasingly clear, however, that acreages of some crops on individual farms are often not proportional to the size of the farm or even correlated with the size of the farm. This is particularly true of crops other than the main cash crops.

It has been found that *average acres per farm* is in some cases a more reliable indication than the "ratio to land." Computation of ratios to farm land in such instances actually introduces variability, as the farm land fluctuates from one sample to another, instead of eliminating variability. In cases in which crop acreages are highly correlated with farm size without being approximately proportional, the "ratio to land" indication is still useful. If the average farm size in the sample tends to be consistently too high, as is generally true, the ratio will be subject to a consistent bias, but the effects of this bias are eliminated in the chart reading. It is possible to substitute a regression adjustment for the simple "ratio to land" to eliminate the effects of variability in farm size; but experience has shown that little is gained thereby except in rare cases in which the sampling fluctuations in average farm size tend to be large from sample to sample. It has usually been found more convenient to use some other base in preference to farm land when computing ratios, rather than to apply more refined techniques to the treatment of the "ratio to land."

Sometimes acreages of individual crops which are not proportional to farm land are proportional to cropland. In such cases it is theoretically possible to use ratios to cropland in charts such as those given above. A serious disadvantage of using cropland as a base is the fact that there is more variability in crop reporters' ideas of what constitutes cropland than of what constitutes farm land. On the whole, the advantages of the cropland base rarely outweigh its disadvantages, so it is seldom used.

A device often employed is to work with the ratio of reported crop acreages in a current year to acreages of the same crops on the same farms reported in the preceding year. In this work this is called an "identical" indication. Charts are prepared showing the relation between percentage of preceding year in the sample and percentage of preceding year for the State. These charts are used to eliminate the bias that may be present in the sample ratio.

A modification of this procedure is found in the so-called "current/historic" indication—the principle is the same as for the "identical" indication. Instead of matching a current report with the corresponding report for the previous year, the farmer is asked to supply in the current report the preceding year's acreage of each crop along with the current acreage. This might be expected to give about the same results as the "identical" indication, but it has been found that the data reported by farmers for the preceding year are often subject to error because of memory bias and other reasons. Consequently, this indication does not always serve as well as the "identical" or current/current indication. In spite of these deficiencies the current/historic indication may give better results than other indications.

The improvement over the current/current indication is due to the fact that: (1) The number of identical farm reports available for matching to compute the current/current indication in any one year is usually much smaller than the total number available to compute a current/historic indication, (2) changes may have taken place the previous year after the time of the survey, and (3) operators may have been in business one year but not another. Paired schedules are rarely available because of nonresponse, but data for such operators are reflected in the current/historic indication, at least if they are in business in the current year.

For some items, simple per farm averages contain less sampling variation than "ratios to land" or some similar base. This is particularly true of livestock numbers, and of large farms of 1,000 acres and over in the Great Plains States. A chart showing the relation between the average numbers per farm for the sample farms and the total number present in the State, over a period, provides as good an estimating tool as can be obtained from the reported data. The correlation between the item to be estimated and the item used as the base must be rather large before a ratio indication can be very effective in reducing sampling variation. If y represents the sample per farm average of the item to be estimated and x represents the sample per farm average of the base item, the coefficient of variability of the ratio $R = y/x$ is given approximately by the equation,

$$v_R^2 = v_x^2 + v_y^2 - 2r_{xy}v_x v_y$$

where v_x and v_y are the coefficients of variability of x and y, and r_{xy} is the correlation between the two items. For simplicity, assume that v_x and v_y are equal. We then have

$$v_R^2 = 2v_x^2 (1 - r_{xy}).$$

It is clear that unless r_{xy} is greater than 0.5, $v_R{}^2$ will be larger than $v_r{}^2$ and the ratio estimate will have a greater sampling error than an estimate based on the simple per farm average.

DIRECT EXPANSIONS

In the absence of historical series of indications and estimates, it is necessary to make direct expansions of sample data to estimates without reference to such series. This in turn requires that more careful attention be given sample design. Bias must be eliminated from the sampling process in advance or corrections for bias in the sample data must be made by some other means.

An example of the direct expansion of sample data to an estimate may be found in the Interior Mill and Elevator Wheat Stocks report for Colorado, January 1949. There were 255 plants in the State (excluding a group of large plants that were completely enumerated) on January 1, with a total rated storage capacity of 9,942 thousand bushels. When these plants were sent mailed questionnaires on January 1 asking for reports on wheat stocks, returns were received from 78 of them, representing a total capacity of 3,928 thousand bushels. These 78 plants reported a total of 1,905 thousand bushels of wheat on hand.

In this case there is no question about having a representative mailing list because every plant in the State was on the list. But it is clear that large plants were overrepresented in the 78 that returned the questionnaire; the average capacity of these 78 plants is 50,359 bushels, whereas the average capacity of all 255 is only 38,988 bushels. The average wheat stocks on hand per plant is 24,423 bushels. Since the average capacity is higher for the sample plants than for the State average, it is reasonable to suppose that the average stocks per plant is also too high. If it is assumed that the percentage discrepancy in average stocks per plant is equal to the percentage discrepancy in plant size; use could be made of the ratio estimate—

$$\frac{9,942 \times 1,905}{3,928} = 4,823 \text{ thousand bushels}$$

—as the estimate of the total stocks held on January 1 by the 255 plants in the State.

This procedure raises several questions. It provides a valid estimate only if stocks held by individual plants tend to be proportional to plant capacity—in other words, if the ratio of stocks on hand to plant capacity tends to be the same for all plants regardless of size. Although this appears to be a reasonable assumption when stocks are high and practically all plants are filled almost to capacity, the situation may be entirely different when stocks are low. A more reasonable adjustment for the discrepancy between average size of plant, for the sample and the State as a whole, can be obtained by using the regression of stocks on plant capacity. If the relationship actually is nothing more than a simple proportional line, as assumed in the ratio estimate, the regression adjustment will automatically give the same result as the ratio estimate. On the other hand, if the line of relationship does not pass through the zero point on the chart and the use of the ratio is not warranted, the regression adjustment will make the proper correction for the discrepancy in average size of plant.

This adjustment is made by the equation,

$$\bar{y'}_s = \bar{y}_s - b\,(\bar{x}_s - \bar{x})$$

in which

$\bar{y'}_s$ = adjusted average stocks for plants in the sample

$\bar{y}_s$ = observed average stocks for plants in the sample

b = regression coefficient of stocks on plant capacity

$\bar{x}_s$ = observed average capacity for plants in the sample

$\bar{x}$ = average capacity of all plants in the State.

For the data at hand:

$\bar{y}_s$ = 24,423 bushels per plant
$\bar{x}_s$ = 50,359 bushels per plant
$\bar{x}$ = 38,988 bushels per plant

The regression coefficient, b, is the only quantity whose numerical value is yet unknown. To keep the extent of arithmetic required to a minimum, an approximate estimate of b is computed as follows. The sample plants are separated into two classes on the basis of size (capacity). The average capacity and stocks per plant are computed separately for each class of plants. The ratio of the differences of these averages is an estimate of b. For data at hand the results are:

	Average capacity	Average stocks
Large plants	74,082	37,398
Small plants	10,276	2,500
Differences	63,806	34,898

$$b = \frac{34,898}{63,806} = 0.5469$$

$\bar{y'}_s$ = 24,423 — (0.5469) (50,359 — 38,988) = 24,423 — 6,219 = 18,204. The estimate of stocks held by all 255 plants thus is (255) (18,204) = 4,642 thousand bushels. This esti-

mate is slightly lower than the ratio estimate of 4,823 thousand bushels. Both this method and the ratio-to-capacity method are based on the implicit assumption that the relation of stocks to capacity for plants in each size group is the same for reporting and for nonreporting plants. To the extent that this assumption may not be valid, neither method would completely adjust the sample data for selectivity in the returns.

This method of adjusting sample averages has been useful in problems of this type. Estimating the production of baby chicks, for example, presents practically the same problems as does estimating grain stocks. Here the universe consists of a number of hatcheries of known incubator capacity, analogous to the storage capacity of mills and elevators. Estimates can be derived from the ratio of chicks hatched to incubator capacity for the sample plants, or by using the regression adjustment.

At first glance it would seem that the regression adjustment would be useful in a wide range of problems, including estimates of crop acreages and livestock numbers. But it has been found that other kinds of biases in the returns from mailed inquiries are often so large that a regression adjustment based on a single control item (as farm-size) does not contribute enough by itself to make its use worth while. In most surveys of crop acreage there is a strong tendency for somewhat larger crop-growing farms than the average, as defined by the Census of Agriculture, to be overrepresented in the sample. Those farms are not typical of all larger farms, because many large farms that are devoted to livestock production have little crop acreage. Consequently it is relatively useless to attempt by elaborate methods to adjust the sample data for the deviation of the average farm size in the sample from the average farm size for the universe.

The same sort of situation may be found in livestock surveys. The large farms that appear in the sample have a tendency to be the particular large farms that are devoted to livestock; large farms devoted mainly to crop production tend to be underrepresented. When a control item can be found that is correlated highly enough with the item to be estimated to be useful for eliminating these biases, it is generally found that the relation between the two items is so close to a proportional line that the regression approach is not needed. Naturally, there are exceptions. In making livestock estimates, for example, the only efficient control seems to be numbers of livestock on hand on a preceding date. Numbers on hand on a current date are generally proportional to the numbers on hand the preceding year. But some items, such as poultry, may be present on a farm in

large numbers one year and almost completely absent the next, or vice-versa. For such items a regression approach sometimes makes it possible to derive accurate estimates of current inventories by direct expansion of the sample data. A simple $\frac{current}{current}$ percentage relationship or $\frac{current}{historic}$ percentage relationship would not give accurate results in such cases without recourse to a chart to eliminate the bias caused by lack of proportionality.

When dealing with specialized universes, the sample design may be rather complicated and attention must be given to the weights to be assigned to the data from the various strata. A case in point is found in a national sample of ice cream plants that was selected for estimating the production of ice cream currently by months.

The universe consisted of about 4,000 plants of which 1,000 were to be sampled periodically through the use of mailed schedules. Estimates were to be made by measuring the percentage change in production from a preceding date. The percentage change was to be computed separately for the group of plants falling in each of 5 production classes, from which a weighted average was to be derived for every State on the basis of the relative contribution of all the plants in each production class to the total production for the State. Records of annual production for 1944 were used to derive the weights to be assigned to the production classes. The 5 classes were as follows:

Class	1944 production thousand gallons
A	less than 50.
B	50–199.
C	200–499.
D	500–999.
E	1,000–and over.

The relative contribution of all plants in any group to the total production in a State varied from State to State and was computed separately for each State.

The sampling problem involved allocating the sample of 1,000 plants to the States and to the five production classes within each State in such a way as to obtain the most accurate national estimates consistent with a specified degree of accuracy in the estimates for each State.

The first problem was to decide the accuracy desired in the estimates for individual States. A constant standard error in the estimates from State to State is not necessary because of the wide range in production; the lowest producing State manufactured about 0.5 million

gallons a year while the highest producing State manufactured about 40 million gallons a year. A standard error sufficiently small to insure acceptable estimates for the low-producing States would be much smaller than required for the high-producing States. A constant percentage error would not be satisfactory because a percentage error that would be acceptable in a low-producing State would represent an unreasonably large error in terms of gallons in a high-producing State. A practical compromise between these extremes was found by setting an error limit in terms of gallons that would be proportional to the square root of the production of a State.

In the present problem the standard error for the highest producing State would be about 9 times as large as the standard error for the lowest producing State. In other words, if the sample yielded a 10-percent error for the lowest producing State it would at the same time yield only about a 1-percent error in the highest producing State. These limits would be acceptable to the users of the estimates and would not impose a higher degree of accuracy in any State than is actually required at the present time.

In deriving the equation representing the standard errors of the estimates, it is assumed that the standard error of the percentage change, indicated by a sample of any given size for any of the five production classes within a State, would be constant, regardless of the volume of the production. Under this assumption and under the restriction that the standard errors of the estimates for individual States were to be proportional to the square roots of State production levels, the most efficient allocation of sampling units could be worked out by usual methods.

The number of plants to be sampled in any State was found to be proportional to the level of production; a State producing 20 percent of the ice cream manufactured in the United States should be allotted 20 percent of the 1,000 sample plants. It was also discovered that, within a State, the allocation to each of the five production classes should be proportional to the contribution of the production in each class to the State total. The national sample of 1,000 plants was allocated to States, and to production classes within States, by this method, using production data for 1944.

Obviously the contribution of each State to the national total and the contribution of each production class to a State total do not remain exactly constant from month to month or from year to year; however, the relative contributions probably remain sufficiently stable for this kind of allocation to be fairly efficient for several years. In almost every State the allocation

called for a complete enumeration of the plants in the upper production classes, so that the plants sampled in each individual State always accounted for a high percentage of the production in the State, even though the number of plants sampled was small. Whenever the mathematical theory called for a larger number of plants to be sampled in a class than was actually present, the rule was to assign a complete enumeration to that class and to distribute the remainder of the theoretical number proportionately among the remaining classes, using the same proportionality factors as were used for the original theoretical allocation. The total number of sample plants thus remained at 1,000 through this point in the sampling process.

When there were only 6 or 8 plants in a State, a sample of 3 or 4 might have met the specifications of accuracy that had been imposed for States in general, but interest might have focused on the output of all plants in the State with considerable intensity locally, so that relatively small discrepancies in the estimates would be subject to criticism. It was decided that a complete enumeration of plants under such conditions was preferable to adopting the quota specified by the sample. This increased the total size of the sample above the predetermined 1,000.

In making estimates from the data, average ratios to base production need to be computed separately for each class of plants in every State. These ratios must be combined into a weighted State average ratio, using total production for all plants in a class during the base period as the weight to be given to the sample ratio for that class. In practice this amounts to computing the estimated total separately for each size group class and adding the results. When the State estimates have been computed, they are added together to give the national estimate. Unless the sample data are properly weighted according to this procedure, the benefits of the sample design might be lost and a bias might also be introduced into the final results. Similar methods of sampling and estimating have been applied to other surveys, particularly to surveys designed to estimate livestock slaughter in nonfederally-inspected plants.

ADJUSTMENT OF DATA FOR NONRESPONSE IN MAIL SURVEYS

At several points in this chapter reference has been made to selectivity in mail-survey returns and to the methods that are currently used to deal with this problem. Merely setting up a mailing list that constitutes a representative sample of the universe does not of itself solve the difficulty. Returns from a representative mailing list may be almost as selective as

the returns from a mailing list that is itself a selective sample of individuals. The current methods of eliminating, or at least reducing, the effects of this selectivity are (1) using chart readings from charts showing the relation between sample indications and "true" values over a considerable period, (2) using control information to stratify and weight the returns or to serve as a base for direct ratio or regression expansions, (3) conducting interview surveys parallel with mail surveys to get a measure of degree of selectivity in mail returns, and (4) interviewing follow-ups on samples of nonrespondents to mail surveys. The first two are widely used; the third and fourth have been tried on a rather limited scale.

Generally, the first three methods are reasonably effective even when the original mailing list is itself a somewhat selective sample of the universe, but the fourth can give satisfactory results only when the original mailing list is a representative sample. Every effort is made to eliminate selectivity in the original mailing lists, even when one of the first three methods is used, to reduce the possibility of unmeasurable biases creeping into the results from that source. Results obtained so far with methods (3) and (4) indicate that the latter of these two is statistically the more efficient; final estimates more nearly accurate are obtained for a given amount of interviewing when the interviewing is done with a sample of nonrespondents to a mail survey than when it is done with a parallel independent sample.

A novel approach to the problem of eliminating nonresponse bias from a mail survey when the original mailing list is a representative sample has been suggested. This method, which may be called the "method of repeated mailings" or "sampling in depth", has not yet been tried in current operations or even studied thoroughly on a research basis. If preliminary findings from the few research studies that have been made are substantiated, this method may provide an inexpensive means of measuring nonresponse biases and eliminating them from final estimates.

The method requires that a representative sample of the universe be used for the original mailing list. The following numerical illustration shows how it operates. A questionnaire was mailed to every member of a universe of 3,241 fruit growers in North Carolina. Those who did not respond were sent a second request, and the nonrespondents to that received a third request. The average number of trees per grower may be considered as the variable under study; the correct figure for the universe was available from another source for checking the results.

The results from the three mailings are listed below, together with two characteristics of the universe.

Mailing (X)	Questionnaires returned	Average trees per grower (Y)
	Number	Number
1	300	456
2	545	382
3	434	340
Universe	3,241	329

There is a tendency for the smaller growers to be less willing to report. Letting the number of the mailing, X, represent the resistance to returning the questionnaire, it appears that log X is normally distributed. Using the tables of the normal probability integral, which gives the frequency of observations occurring at any specified distance from the mean, and looking up the normal deviates corresponding to the cumulative percentage responses from the three successive mailings, we get the following results:

Mailing (X)	Log X	Cumulative response	Normal deviate (D)
		Percent	
1	0.000	9.3	— 1.323
2	.301	26.0	— .643
3	.477	39.4	— .269

It appears that log X is linearly related to these normal deviates, as shown in figure 7.
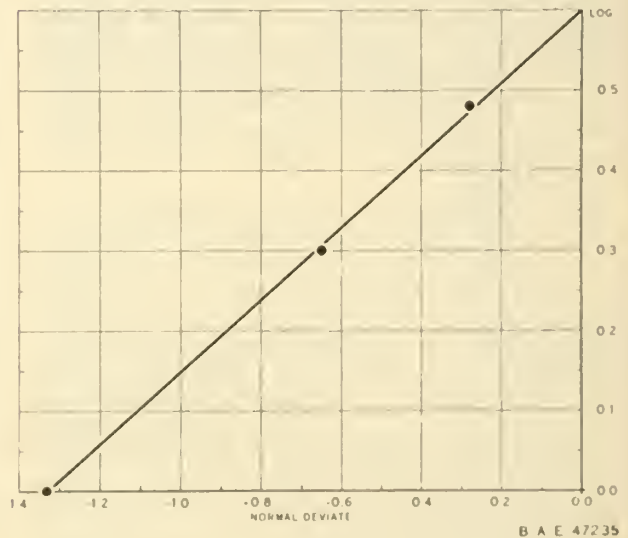
FIGURE 7.—Relation between Normal deviates and logarithms of resistances.

The intercept of the line of relationship on the vertical axis, 0.600, represents the logarithm of the average resistance. This means that the

average resistance, $\bar{x}$, for all growers in the universe to returning the questionnaire is 3.98. The slope of the line represents the standard deviation of the logarithms of the individual resistances for all growers.

The average numbers of trees per grower from the individual mailings seem to be related to the resistances. It seems more logical for this computation to set the average resistances of the individuals responding to the three mailings equal to 0.5, 1.5, and 2.5, rather than to use the numbers 1, 2, and 3. The averages for individuals responding to the three mailings are more realistically represented by the midpoints of the intervals 0 to 1, 1 to 2, and 2 to 3. For the computations culminating in figure 7 the upper limits of those class intervals were the logical numbers to use.

To study the relation between average resistance and trees per grower for the three classes of respondents, the logarithms of the absolute values of the deviations of the resistances and tree numbers from the universe averages are computed. The data are:

x	Y	$\|X - \bar{x}\|$	$\|Y - \bar{y}\|$	$log\|X - \bar{x}\|$	$log\|Y - \bar{y}\|$
0.5	456	3.48	127	0.542	2.104
1.5	382	2.48	53	.394	1.724
2.5	340	1.48	11	.170	1.041
3.98	329	.00	0	. . . . .	. . . . .

The relationship between the logarithms is shown in figure 8.
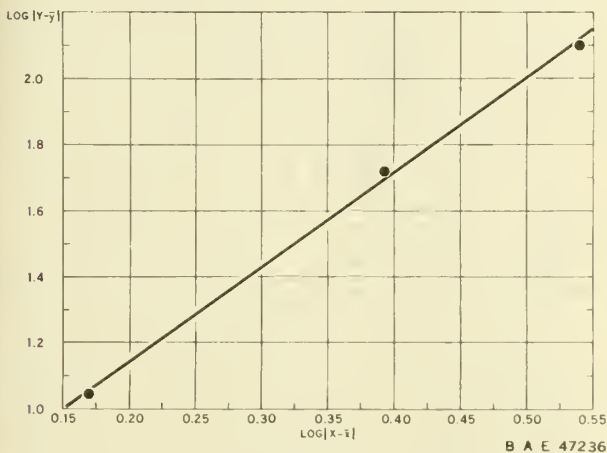
FIGURE 8.—Relationship between resistance and trees per farm.

$$\log |Y - \bar{y}| = k \log |X - \bar{x}|$$

The slope of the line of relationship is approximately equal to 3. This indicates that the average number of trees per farm from each of the successive mailings is a linear function

of $(X - x)^3$; thus $Y = y + b (X - x)^3$. The variables that are to be plotted on a chart are now as given below:

X	$(X - \bar{x})^3$	Y
0.5	— 42.14	456
1.5	— 15.25	382
2.5	— 3.24	340
3.98	— .00	329

The relationship between $(X - x)^3$ and Y is shown in figure 9.
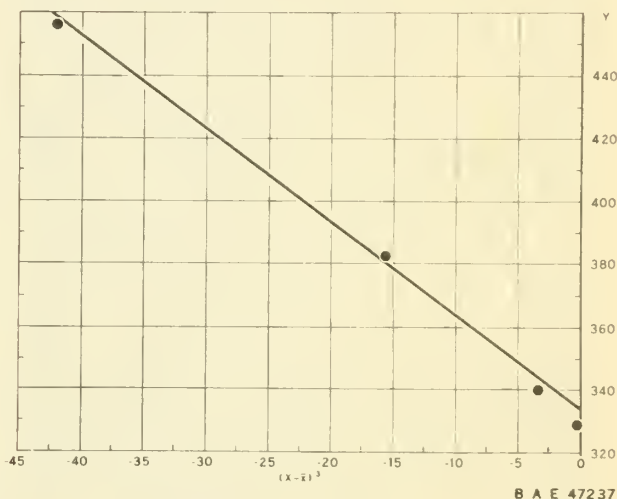
FIGURE 9.—Relationship between resistance and trees per farm.

$$Y = \bar{y} + b (X - \bar{x})^3$$

The line on this chart was drawn just as though the correct value $\bar{y} = 329$ were not already known. If that value were not known, it would be estimated as $\bar{y} = 334$ from the chart reading.

If relationships of this kind are the general rule, the method used in a practical problem would be applied as follows: Starting with a representative mailing list, tabulate the cumulative percentage responses for two or more mailings. Use this information to estimate the average resistances for all individuals in the universe from a chart similar to figure 7. Compute the cubes of the deviations of the average resistances for the successive mailings from the universe average resistance, $(0.5 - \bar{x})^3$, $(1.5 - \bar{x})^3$, etc. Compute the average of the item to be estimated separately for each of these classes of respondents. Plot these averages against the cubes of the resistance deviations on a chart similar to figure 9. Draw the best fitting line through the points on this chart and read the ordinate corresponding to

$(X - \bar{x})^2 = 0$. This should be the universe average for the item to be estimated.

Such a procedure has given satisfactory results in estimating the average numbers of milk cows per farm in a survey covering a sample of milk producers in North Carolina and in estimating average numbers of cattle per farm in a survey of cattle-feeder farms in Nebraska. It failed to give satisfactory results in estimating average incubator capacity for a survey of chick hatcheries in North Carolina and in estimating average crop acreages per farm in a general survey of farms covering several counties in North Carolina. In the chick-hatchery survey, the universe was so small (253 establishments) and so diverse that averages from successive mailings fluctuated erratically. In the general survey of crop acreage the factors affecting response were apparently so complicated that the trends in the averages per farm led to biased results.

Further exploration of the possibilities of this approach is needed. Present indications, as gleaned from the results, are that the method is most likely to give good results when fairly large mailing lists are used in special surveys aimed at gathering information about a single commodity or item. It does not seem to show much promise for situations in which the total sample is small or where information is requested on a large number of items. Psychological factors appear to be involved, in which a respondent's willingness to return a questionnaire increases with his interest in the subject and decreases with the amount of labor involved in filling out the questionnaire. For surveys aimed at getting information about a single item, or a group of closely related items, each of these opposing tendencies is probably highly correlated with his scale of operation on that particular item. On the other hand, in surveys aimed at collecting information on a variety of subjects, the correlation between those tendencies and any one of the items to be estimated probably depends upon many relationships.

SUBSAMPLING

When dealing with mail surveys, and when enough information is at hand to set up a detailed stratification of the universe with an optimum allocation of sampling units to the individual strata, there is every reason for taking advantage of such sample designs. But when conducting interview surveys, or interview follow-ups on samples of nonrespondents to a mail survey, it is generally not feasible to allocate individual sampling units at random to all strata. Some form of subsampling design is generally required to provide optimum accuracy

for a specified total expenditure. Most surveys of farms that have been conducted by this method have used counties as primary sampling units. The entire universe of counties is first stratified on some pertinent basis, a sample of those counties is selected, and samples of farms are selected only from the counties chosen for inclusion in the sample.

The sampling variance of averages per farm from such a sample is given by an equation of the type

$$\frac{\sigma^2}{\bar{x}} = \frac{\sigma_c^2}{n_c} (1 - P_c) + \frac{\sigma^2}{n_f} (1 - P_f)$$

in which σ_c^2 and σ^2 represent the differences between counties and between farms in the same county, n_c and n_f represent the number of counties and the total number of farms included in the sample, and P_c and P_f represent the fractions of all counties and all farms that have been included in the sample. σ_c^2 and σ^2 are pure variance components as estimated from an analysis of variance.

The county-to-county variation is generally rather large and contributes heavily to the standard error of a per-farm average. Various devices have been introduced to minimize the contribution of this component to the total sampling error. One device is to attempt to classify all counties into extremely homogeneous groups before selecting the sample counties. Another is to make use of census county data as a control in computing the estimates. The estimating process then proceeds in two stages. First the individual farm data are expanded to a total for the subuniverse of n_c counties. The ratio of this total to a corresponding total in a previous census year is computed and then multiplied by the State total for the previous census year, to arrive at the final State estimate. If the correlation between county totals in successive years is high, the use of this ratio estimate practically eliminates the effects of σ_c^2 in the above equation.

A third device, which is becoming increasingly popular, involves selecting the counties with probabilities proportional to size from previously delineated strata. Size of county here refers to the amount of the item that is to be used as the weighting factor in deriving estimates from the data. If the estimates are derived from per-farm averages, number of farms is the measure of size; if estimates are derived from ratios to farm land, total farm land is the measure of size; to estimate crop yields, the total acreage in that crop is the measure of size. When the measure of size to be used in a particular problem has been determined, counties are selected at random with probabilities proportional to size.

It is desirable to consider this method of sampling in some detail. For simplicity, assume that the method is used in a State without preliminary stratification. If $P_i = \lambda X_i$ represents the probability of selecting a county of size X_i, and Y_i represents the total amount in the county of the

item to be estimated, we may study the properties of the ratio $R_i = \dfrac{Y_i}{X_i}$. An unbiased estimate of the State average ratio $\bar{R}$ from a sample of n counties selected with those probabilities is given by $\bar{R} = \dfrac{1}{n} \overset{n}{\underset{i=1}{S}} (R_i)$. This estimate gives the ratio from each county in the sample the same weight. It can be justified on the grounds that the expected frequency of occurrence, in the sample of n, of each of the N counties present in the State is nP_i. The observed frequencies are either zero or unity. With that mathematical model, it can be proved that the expected value of $\bar{R}$ is equal to the true value of the ratio for all N counties in the State, or symbolically,

$$E(\bar{R}) = \overset{N}{\underset{i=1}{S}} (P_i R_i).$$

Unfortunately, when sampling from a finite population this model is rigorously correct only for samples $n = 1$. For that reason some workers who have used this method of sampling have first set up a detailed stratification of the universe and selected one county from each stratum. The relationships mentioned then hold true rigorously for each stratum and no theoretical difficulties arise, so far as getting unbiased estimates of $\bar{R}$ are concerned. But if more than one county is selected from a stratum, or from the State without stratification, the following situation arises. A sample of n counties, as a matter of practical operation, is selected by drawing one county at a time with probabilities proportional to size. The largest county is more likely than any other to be chosen on the first draw; the second and following draws are then restricted to remainders of the universe in which the average size of county becomes progressively smaller.

A numerical example makes this clear. Suppose a sample of 10 North Carolina counties is being selected by this method in which the X_i represent 1940 peanut acreages. Using the concepts on which the preceding formulas are based, the expected average 1940 peanut acreage per county in the sample should be 22,280 acres. The average actually observed in a sample of 10 counties was only 16,999 acres per county. Obviously the P_i should be regarded as functions of n rather than as constants, and the formulas modified accordingly.

The exact solution of this problem could be found without theoretical difficulties, but the tedious computations involved make the method impracticable. An empirical solution can be derived that is not too difficult. The N counties in the universe can be visualized as being in n strata with one county per stratum. The expected number drawn from one of these strata on a single draw should be proportional to the product of P_i and 1, minus the expected number already taken from that stratum in previous draws. This leads to the equation $(1 - p_i) = (1 - P_i)^t$ in which p_i is the expected number of counties taken from the i-th stratum for a total sample of n, and the exponent t is chosen so that $\overset{N}{\underset{i=1}{S}} (p_i) = n$. The quantity $P'_i = p_i/n$ then represents the true probability of drawing the county having size X_i in a total sample of n. It is clear that $P'_i = P_i$ when $n = 1$ and that $P'_i = 1/N$ when $n = N$. For the sample of 10 North Carolina counties previously mentioned, the expected value of $\bar{x}$ should thus be equal to

$$\overset{N}{\underset{i=1}{S}} (P'_i X_i) = 17,694$$

acres, which is much closer to the 16,999 acres actually found in the sample of ten counties. An unbiased estimate of the average ratio should then be given by

$$\bar{R} = \frac{1}{n} \overset{n}{\underset{i=1}{S}} \left(\frac{P_i}{P'_i} R_i \right)$$

These matters are perhaps only of academic interest. When the sample is small in relation to the size of the universe, the simpler mathematical model first presented probably serves well enough in practice. For a recent objective survey conducted to measure yields of corn in Alabama, a sample of 20 counties was selected with probabilities proportional to the corn acreages in the individual counties. Assuming that $P_i = \lambda X_i$ represents the true probability of drawing a county with acreage X_i, an unbiased estimate of the State average yield per acre should be obtained by computing the average yield separately for each of the 20 sample counties and computing a "straight" or unweighted average of the average yields of the 20 individual counties. Using 1945 census data as a check, it is determined that the average 1945 yield, computed in this way from the 20 sample counties selected, is 15.2 bushels per acre while the weighted average for all farms in the State is 15.1 bushels per acre. Similar tests were applied to the data supplied by the regular 1948 State yield surveys. The weighted State averages and the unweighted averages of the 20 sample-county averages are as follows:

	Average yield, bushels per acre	
	Weighted State Ave.	Sample Ave.
September General Schedule	23.1	23.2
October General Schedule	23.5	23.0
November General Schedule	24.2	23.9
December acreage and production survey	22.8	23.1

The approximations involved in neglecting deficiencies in the theory do not seem to have any serious detrimental effects on the results.

Some interesting applications of this method of sampling have been made recently in connection with interviewing samples of nonrespondents to mail surveys. It was used in connection with a 1946 State-wide survey of commercial peach production in North Carolina and with 1948 surveys of farm grain stocks in Indiana, Kansas, North Carolina, and Washington. In all cases the purpose of interviewing samples of nonrespondents was to test the possible bias in the results from the mailed returns alone, and to make appropriate corrections where necessary. As the mail surveys were of a widely dispersed sample of individual farms, a random sample of the nonrespondents would have been so widely scattered that costs of travel would have been excessive, so samples of counties were selected and samples of nonrespondents were interviewed only in those counties.

In the survey of peach production the final estimate depended upon the numbers of fruit trees on the growers' farms. As State Farm Census records showed the number of trees for every grower on the original mailing list, it was possible to select sample counties with probabilities proportional to the total numbers of nonrespondents' fruit trees. The total sample of nonrespondents was kept on a self-weighting basis by setting the within-county sampling rates at such a level that about the same total number of nonrespondents' trees was accounted for in every county selected.

In the surveys of grain stocks estimates of stocks were derived from ratios of stocks to production. As production data for individual farms in the original mailing lists were not available, the only control that could be exercised in drawing samples of counties was to choose them with probabilities proportional to the number of nonrespondent farmers in each county. From the sample of nonrespondents interviewed, an average ratio of stocks to production was computed; this was then combined with a similar ratio from the mailed returns to arrive at an unbiased estimate of the true State average. It was found that the average production per farm was lower for the nonrespondents than for the respondent group. Therefore, instead of weighting the two ratios by numbers of farms to arrive at a State average, they were weighted by the relative production for each of the two classes of farms. Total production for the respondent group was available from the mailed returns, but total production for the nonrespondent group has to be estimated from the sample of nonrespondents; the average production per farm for the interviewed nonrespondents was multiplied by the total number of nonrespondents to arrive at total production of all nonrespondents.

This concludes the general description of methods of sampling and estimating used in the Federal-State agricultural estimating work. The following chapters shed more light on the details involved in their application to the many kinds of estimates currently made by the organization. It is hoped that the material in this chapter gives some idea of the problems that are faced and the steps that are being taken or contemplated to deal with them. The more specialized procedures and the modifications that are made in the general schemes in order to deal with special conditions encountered in the course of the daily work of the organization can best be described in connection with the subjects discussed in the following chapters.

By John F. Marsh and C. E. Burkhead

IMPORTANCE

Acreage forecasts and estimates serve several fundamental purposes. Most important, they are one of the bases for production forecasts and preliminary estimates of nearly all field and vegetable crops, which are the product of independent forecasts on estimates of acreage multiplied by yield. Similarly, in the case of all but a few cash crops for which nearly complete processing or marketing data are available, final production estimates are the product of estimates of acreage multiplied by yield. Furthermore, forecasts and estimates of acreage help farmers to plan their plantings, serve as direct measures of land utilization, and are primary indicators of the probable future demand for various farm-production supplies and for farm labor.

SCOPE

Estimates of harvested acreage are generally used in the preparation of production estimates, but estimates of acreage intended or remaining for harvest, of acreage planted, or even of acreage intended for planting, are used in the preparation of production forecasts made prior to harvest. The sequence of acreage forecasts or estimates for most spring-sown crops is: (1) Acreages intended for planting ("Prospective Plantings") as of March 1, released late in March; (2) acreages planted and acreages for harvest, released with the July General Report; and (3) acreages planted and harvested, released in the Annual Summary in December. This sequence is not followed on all individual crops, however. Estimates of the acreages planted to the fall-sown grains, wheat and rye, are released in December of the year preceding harvest. Acreage remaining for harvest is estimated in May.

No estimate of intended or planted acreage of cotton is made, as the Department is prohibited by law from publishing intended acreage of cotton or prospects prior to July 1. Instead, an estimate of acreage in cultivation on July 1 is followed by an estimate of acreage remaining for harvest on September 1 and an estimate of harvested acreage, which is released in December. In general, however, the progression of acreage forecasts and estimates is from prospective plantings to actual plantings, acreages for harvest, and actual harvested acreage.

The purpose of the report on prospective plantings issued in March is "to assist growers generally in making such further changes in their acreage plans as may appear desirable. The acreages actually planted . . . may turn out to be larger or smaller than indicated, by reason of weather conditions, price changes, labor supply, financial conditions, the agricultural program, and the effect of this report itself upon farmers' actions." [6] The report on prospective plantings is released early enough so that modifications of plans are possible (except in the extreme South) to avoid overproducing a given crop or to take advantage of anticipated favorable prices to growers owing to small prospective acreages of other crops. To the extent that the prospective plantings report induces such changes in plans, the acreage actually planted can be expected to vary from the estimates based on intentions. However, the prospective acreages are used as a base to which forecast yields per planted acre for a few spring-sown crops are applied, to give a production forecast before the July acreage estimates are available.

Planted acreage of most crops is often somewhat larger than the harvested acreage because crop failure may take part of the planted acreage. There are reasons other than crop failure and resulting abandonment. The acreage of corn harvested for grain, for example, may be smaller than the total acreage of corn planted, because part of the planted acreage may be harvested for silage and part may be used for forage, including acreage grazed or hogged. The acreage harvested for each use is estimated separately. In the case of sorghums, these three uses plus a fourth, for sirup, are estimated. The break-down of soybean acreage is for beans, hay, and other purposes. Cowpea and peanut acreages are treated in the same way. The estimate of the acreage of each small grain (wheat, oats, barley, rye) harvested for grain includes acreage harvested ripe and fed unthreshed, but excludes any acreage harvested for hay. The aggregate acreage of all small grains cut green for hay is estimated as a single figure and is published as one of the kinds of

[6] United States Bureau of Agricultural Economics, Prospective Plantings for 1949, March 21, 1949. [Processed.]

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hay. There has been an almost continuous pressure from the public for earlier estimates of acreage and prospective production, as well as estimates on more crops and more methods of utilization.

In general, acreage estimates are based upon two types of information: (1) Absolute acreage data for a given crop season, ordinarily obtained from the quinquennial United States Census of Agriculture, a State Assessors' Census, or some other complete or nearly complete enumeration, and (2) indicated changes in acreages of individual crops from one year to the next, obtained by questionnaire from samples of farmers or processors. Acreage data of the first type are called acreage bases or bench marks, while the sample data are called acreage indications.

ACREAGE BASES OR BENCH MARKS

United States Censuses of Agriculture, taken each 10 years from 1850 to 1920, and each 5 years since 1920, provide data on harvested acreage for most of the principal crops. These data are not strictly comparable from State to State nor among the crops, but in general they afford satisfactory bench marks for viewing long-time changes in the principal crops grown in this country. Generalizations that evaluate the census data can hardly be made because of differences among States and differences between censuses in timing and questions asked. But, it is safe to say that for most crops Federal census totals represent minimum levels, except where there are possibilities of duplication or misunderstanding.

The annual State assessors' census is another valuable bench mark in 14 States. These vary in completeness from State to State; in some States they are not complete enough to serve as absolute bench marks. Whereas data from the State assessors' census, where taken, are available in time for either final acreage estimates each December or for the revisions the following year, the Federal census data do not become available until a year or more after the year to which they relate. Accordingly, they are used for bench marks in future years and for "truing up" historical estimates. The revisions made after each quinquennial census are known as census revisions since the bulk of the new evidence comes from the census, but other relevant data are considered at the same time.

ESTIMATING YEAR-TO-YEAR ACREAGE CHANGES

An almost ideal method of obtaining accurate acreage information would be to make a complete enumeration by mail, by personal interview, or a combination of both. This would provide a means of obtaining figures on both planted acreage and harvested acreage by method

of utilization. This ideal is hardly approached even in the States where the assessors' censuses ask for acreages in the current rather than the preceding year, for ordinarily only one type of acreage information, either planted or harvested, is available. Furthermore, insufficient time elapses between the harvesting of late crops and the date of the final acreage and production estimates in December to make possible the use of assessors' census data even if the assessors' censuses were taken in the late fall after harvest, which they never are.

Because of the rigid time schedule and limitations imposed by costs and available personnel, it is necessary to derive, from sample data, acreages as percentages of acreages of the previous year. These percentages are applied to the previous year's acreages to obtain indications of current acreages. For example, the indicated percentage which the acreage of corn for all purposes this year is of last year's acreage, is applied to last year's acreage to obtain an estimate of the acreage this year.

Two main types of samples are used in obtaining sample data—one for crops that are widely grown and the other for those crops that are grown in specialized localities which would not be adequately represented in a general-purpose sample. For the general surveys of field-crop acreages already mentioned—the March prospective plantings, June acreage, and the fall acreage surveys—questionnaires are designed to obtain data on crops widely grown within a State. These questionnaires are all in the form of cards; the questions relate to the individual operations of the growers who answer the questions. (See C.E. 2–8821"N", 2–8477"L", and 2–8597"E", Appendix D.)

In most States the March prospective plantings cards and the June acreage cards are sent to large lists of general farmers. The fall acreage survey cards are distributed in most States in October, by rural mail carriers to farmers along their routes. Presumably the distribution is more nearly random than when questionnaires are mailed to farmers on lists maintained in the State offices. Between 10 and 20 cards are allotted to each of the 32,500 rural carriers for distribution to representative farmers on their routes. In a few States the fall cards are also mailed direct to each reporter who sent in a card the previous year, in order to provide a large number of "identical" returns.

The March survey card regarding prospective plantings (actually mailed late in February) obtains data on the acreages of specific spring-planted crops planned for the current year (or actually planted in the far South) and the acreage planted the previous year. Information on fall-planted crops is also reported and

provides a basis for preliminary estimates of acreage of these crops for harvest. The June cards also ask for both this year's and last year's acreages, while most of the fall acreage survey cards have spaces for reporting only the current year's harvested acreages. The fall cards, when used in areas where abandonment is frequently heavy, ask for both planted and harvested acreages of the various crops.

Sample data are tabulated for each crop along with the reported land in farms or cropland, or both. The data are summarized by crop-reporting districts or by some other predetermined strata. The derived indications for the several strata are weighted together to arrive at weighted State indications. These include:

(1) Ratio of individual crop acreage to land in farms; (2) ratio of individual crop acreage to cropland or land in crops (in some States); (3) current/historic percentage relationship, where acreage of a crop, both this year and last year, is reported on the same card; (4) current/current or "identical" percentage relationship, which is obtained by matching the current year's card with the card sent in by the same reporter for the same farm the previous year; (5) percentage harvested/planted in States where both are reported.

The first 4 of the above indications are derived as follows, assuming that the State has nine crop-reporting districts or strata for purposes of calculating weighted indications.

1. Ratio to farm land =
$$\left(\frac{\frac{\Sigma X_1}{\Sigma F_1} W_1 + \frac{\Sigma X_2}{\Sigma F_2} W_2 + \cdots + \frac{\Sigma X_9}{\Sigma F_9} W_9}{W_1 + W_2 + \cdots\cdots + W_9} \right) 100$$

2. Ratio to cropland =
$$\left(\frac{\frac{\Sigma X_1}{\Sigma C_1} W'_1 + \frac{\Sigma X_2}{\Sigma C_2} W'_2 + \cdots + \frac{\Sigma X_9}{\Sigma C_9} W'_9}{W'_1 + W'_2 + \cdots\cdots + W'_9} \right) 100$$

3. Current/historic percentage relationship =
$$\left(\frac{\frac{\Sigma X_{c1}}{\Sigma X_{h1}} W''_1 + \frac{\Sigma X_{c2}}{\Sigma X_{h2}} W''_2 + \cdots + \frac{\Sigma X_{c9}}{\Sigma X_{h9}} W''_9}{W''_1 + W''_2 + \cdots\cdots W''_9} \right) 100$$

4. Current/current percentage relationship =
$$\left(\frac{\frac{\Sigma X'_{c1}}{\Sigma X''_{c1}} W''_1 + \frac{\Sigma X'_{c2}}{\Sigma X''_{c2}} W''_2 + \cdots + \frac{\Sigma X'_{c9}}{\Sigma X''_{c9}} W''_9}{W''_1 + W''_2 + \cdots\cdots + W''_9} \right) 100$$

Where

ΣX_1, ΣX_2, etc. represent total reported acreage of a given crop in crop-reporting districts 1, 2, etc.

ΣF_1, ΣF_2, etc. represent total reported acreage of land in farms in crop-reporting districts 1, 2, etc.

W_1, W_2, etc. represent estimated total land in farms in crop-reporting districts 1, 2, etc.

ΣC_1, ΣC_2, etc. represent total reported acreage of land in crops in crop-reporting districts 1, 2, etc.

W'_1, W'_2, etc. represent estimated total cropland in crop-reporting districts 1, 2, etc.

ΣX_{c1}, ΣX_{c2}, etc. represent total reported current acreage of a given crop from cards on which the previous year's acreage is also given in crop-reporting districts 1, 2, etc.

ΣX_{h1}, ΣX_{h2}, etc. represent total reported acreage of a given crop during the previous year from cards on which the current year's acreage is also given in crop-reporting districts 1, 2, etc.

W''_1, W''_2, etc. represent estimated acreage of the given crop during the previous year in crop-reporting districts, 1, 2, etc.

$\Sigma X'_{c1}$, $\Sigma X'_{c2}$, etc. represent total reported acreage of a given crop during the current year from cards which have been paired with cards from the previous year from the same farms in crop-reporting districts, 1, 2, etc.

$\Sigma X''_{c1}$, $\Sigma X''_{c2}$, etc. represent total acreage of a given crop reported currently during the previous year on cards which have been paired with cards for the present year from the same farms, in crop-reporting districts 1, 2, etc.

The "ratio to land" indication is the ratio or percentage that aggregate reported acreage of each crop is of the reported total land in farms, worked up separately for each district. The district ratios for the individual crops are weighted by total land in farms. Weighted State average "ratios to land" provide reliable indications for crops grown on a large percentage of all farms. In some States, particularly western semi-arid States, where the reported land in farms tends to fluctuate from year to year, the ratio to cropland is computed to give a more stable indication. This is computed crop by crop, and the district ratios are weighted by total acres of cropland.

The current/historic relationship is expressed as a percentage of the previous year and is derived solely from the current year's survey. Computation of the current/current or "identical" relationship is somewhat more involved, as it is necessary to match entries for each crop on the current year's card with those on the card sent in by the same reporter the previous year. This necessitates arranging the previous year's cards in such a way as to be readily listed with the current data from the current card. The relationship is expressed as a percentage of the previous year, similar to the current/historic indication. In each case the percentage change indicated for each district is weighted by the acreage of the particular crop in the district the previous year to obtain the State indication.

An indication of the total acreage of all crops is obtained by computing the ratio of total crop acres reported to total acres in farms. This indication is weighted by total land in farms and is plotted as the independent variable on a chart with acres of total crops as estimated by the Crop Reporting Board as the dependent variable. This serves as a sort of balance item to keep the total of all acreage estimates in line. After tentative estimates have been set for individual crops, this indication provides a clue as to whether the total for all crops is reasonable, or high, or low. After the figures for the individual crops have been reviewed, adjustments are frequently made which more nearly satisfy all indications.

As there is some selectivity in the response to each of these three acreage surveys, the field statisticians are careful that the surveys are handled comparably from year to year. Large lists of growers of specialized crops are not included, for data from such lists would distort the relationships among the crops.

The summarized data are translated into estimates by means of charts. The final estimates of the Crop Reporting Board are plotted on regular Cartesian chart paper against the survey indications. Selectivity in the sample data does not invalidate their usefulness so long as the bias from this source is relatively constant from year to year. The ratio to farmland and ratio to cropland indications are plotted on the X axis of the charts while board estimates of *acres* are plotted on the Y axis. (See figure 3, Chapter 5.) The derived sample percentage indications are plotted on the X axis and the board percentages of the previous years are plotted on the Y axis, as in figure 10.

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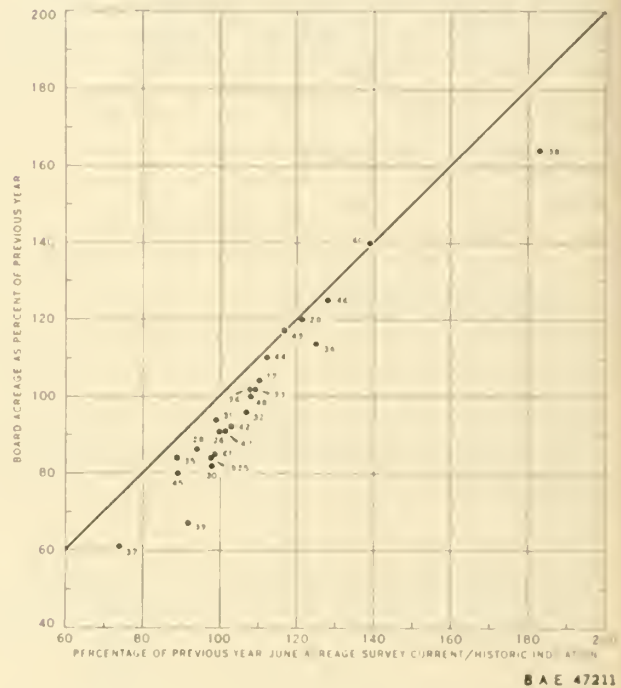
FIGURE 10.—Clover-Timothy Hay, Indiana: Official acreage estimates as percentages of previous years' estimates in relation to percentages of previous years' acreages as reported currently (for current year) and historically (for previous year) in June acreage survey, 1925-48.

SAMPLING CROPS GROWN IN SPECIALIZED AREAS

In the case of crops that are not widely grown or are grown only in localized areas, special surveys are necessary to obtain acreage information. The contents of these special surveys cover a wide range of subject matter, including acreage, and may vary materially from State to State for the same crop. They usually ask for acreage data on the individual farm, and sometimes ask "judgment" questions covering the acreage in the locality as a percentage of the previous year. The current/ historic and identical indications are generally the most re-

liable evidence of change obtained from these surveys. Estimates based on ratios to land or ratios to crops, from special surveys, would not be valid because the correlation between farm size and acres of special crops is usually very low. It is obvious that, with a shifting base, expanding operations would not necessarily give increasing ratios but might even show inverse relationships.

INDEPENDENT SOURCES OF CHECK DATA REGARDING ACREAGE

In addition to special survey data from farmers, sometimes other sources are useful for certain specialized crops. Much information is obtained from factories that contract for acreages of crops for processing, as sugar beets and some vegetables. Sugar beet factories, for instance, provide complete data on both planted and harvested acreage. As these data are complete they are considered more reliable for any crop year than are quinquennial U. S. census data obtained from growers. Irrigation companies that supply water to growers of rice and other irrigated crops are valuable sources of information regarding acreage. Complete reports of railroad and truck in-shipments of seed potatoes provide some evidence of acreage in States which do not produce their own seed. Evidence for estimating crop acreages is obtained for some crops from administrative records of other branches of the Federal Government. The Production and Marketing Administration, the production control agency of the Department, makes allotments of acreages to growers, which provide near-maximum indications of acreages of several crops; actual field measurements from the same source provide minimum indications of the same acreages, because of incomplete coverage and the exclusion of bare spots in the fields and other nonproductive areas.

ESTIMATES OF ACREAGE UTILIZATION

Basic data for the preparation of estimates of utilization of acreage of a given crop are usually obtained by means of the Acreage Utilization and Abandonment Survey card (C.E. 2–8724"E", Appendix D). This is usually mailed in early November each year to individual farmers who are asked to supply information concerning their utilization of planted acreages of various crops and the production obtained on the acreage harvested for each specific purpose. These acreage utilization data are summarized in about the same way as data from the three large acreage surveys. Acreages for each type of utilization and the acreage abandoned are converted to percentages of the reported acreage planted. Each utilization is also expressed as a percentage of total harvested acreage.

These indications are then interpreted by means of charts showing the regression of board estimated percentages for previous years on reported percentages, using census percentages in census years as bench marks. The chart readings are converted to State and national estimates of acreage utilized for each purpose. The sum of the acreages by types of utilization equals the total estimated acreage of the specified crop, either planted or harvested, depending on the categories of utilization included. A more detailed description of acreage utilization estimates is contained in Chapter 8.

REVISIONS OF ACREAGE

Acreage revisions are made and published annually for those crops having complete or nearly complete acreage or production check data. Revisions for these crops such as cotton, tobacco, peanuts, and sugar beets are scheduled as soon as is feasible after marketings of the crops. Revisions for tobacco and sugar crops are made in the May General Report and for peanuts in the July General Report. A special release is made in April or May each year showing revisions for cotton. These acreage revisions are somewhat more involved than the earlier estimates. The same regression charts described above, which are used in making earlier estimates, are reviewed. In addition charted indications from after harvest surveys are used. Acreage measurements by PMA, reports by irrigation companies, factory reports, and all other relevant material are considered; and estimates of acreage that reconcile all the evidence are tentatively adopted concurrently with estimates of yield. These tentative estimates are then further adjusted if necessary so as to provide the production totals that are indicated by the production check data. A more complete description may be found in Chapter 7, which covers revisions of production and yield.

Necessary revisions for all other crops are published regularly in the December General Summary. Some States have additional evidence for most crops from the State assessors reports. In other States less conclusive evidence may be available from shipment data, stocks or other sources that require a review and revisions of estimates for certain crops.

In all States the estimates for each crop are reviewed on the charts in December for indirect evidence even if no acreage or production

check data are available. It has been found that if an appreciable error were made in setting an acreage the previous year, the indications for the current year would be divergent. The indications relating to percent change would produce a current estimate of acreage at variance with the acreage indicated from the ratio charts. If an adjustment is indicated by the evidence the previous year's acreage is revised, thus giving a more reliable base for the current year's estimate. Conversely, if the current year's indications are consistent, the indirect evidence confirms the estimate for the previous year.

CHAPTER 7. PRODUCTION AND YIELD

By Charles G. Carpenter, John J. Morgan, and John F. Marsh

"What is the harvest?" is a primary question to be answered in all crop-estimating work for even the most industrialized and urbanized society still depends upon agriculture, either domestic or foreign, for most of its food and clothing.

The Crop Reporting Board has the responsibility for making (1) annual estimates of crop production and (2) forecasts of crop production from current crop conditions during the growing season. These are two separate and distinct functions. Throughout this chapter the term "estimate" is used to indicate a measure of accomplished fact, that is, at harvest time or later, whereas the word "forecast" is used to refer to expectations of what is likely to be accomplished at some time in the future. The word "yield" refers to yield per acre.

ESTIMATES OF PRODUCTION

The most accurate estimates of crop production are made directly in terms of total bushels, tons, or bales, when complete data covering production are available. The number of bales of cotton ginned, number of pounds of tobacco sold, and number of tons of sugar beets harvested for sugar, are direct measures of the production of those crops. Similarly, the quantity of rice milled, the quantity of peanuts processed, and receipts of flaxseed at elevators, furnish excellent check data on production, although they do not include all of the production of these crops. The small residuals in such cases which include such items as seed, home consumption, and feed for livestock and poultry on farms where grown, are estimated from sample data reported on individual farm disposition schedules, by methods that are discussed in chapter 8. Unfortunately, direct check data on production are seldom available at the time the annual estimates of production are first required. For preliminary production estimates of most field and vegetable crops, therefore, the usual practice is to estimate acreage and yield per acre, then to compute production.

Estimates of yield per acre are based on past relationships between "true" yields obtained from the quinquennial census of agriculture or other nearly complete enumerations, on the one hand, and currently reported sample yields on the other. Current sample yields on a locality basis have come from the regular monthly crop report schedules (C.E.–8579, Appendix D) and the current individual farm yields are derived from an "acreage and production" survey which is usually made in early November.

The acreage and production schedules (C.E. 2–8729, Appendix D) were designed to obtain, as nearly as possible, the type of data that is collected by the Bureau of the Census. But whatever the design of the schedule, data drawn from the voluntary mail samples used by the Department contain biases because of selectivity in the lists and in the response. They cannot ordinarily be accepted without some adjustment. The method used is that of graphic regression described in chapter 5. The dependent variable is the actual or true yield per acre each year, represented on the chart for past years by final estimated yields, which in quinquennial census years are essentially the yields reported by the census. The independent variable is a current indication, such as the reported average yield per acre of winter wheat in Nebraska taken from the August General Schedule (questionnaire) or the derived average yield per acre of wheat in Nebraska, taken from the acreage and production survey. For example, a chart similar to that shown in figure 11 is used in August to estimate the average yield per acre of winter wheat in Nebraska. These charts are brought up to date each year.
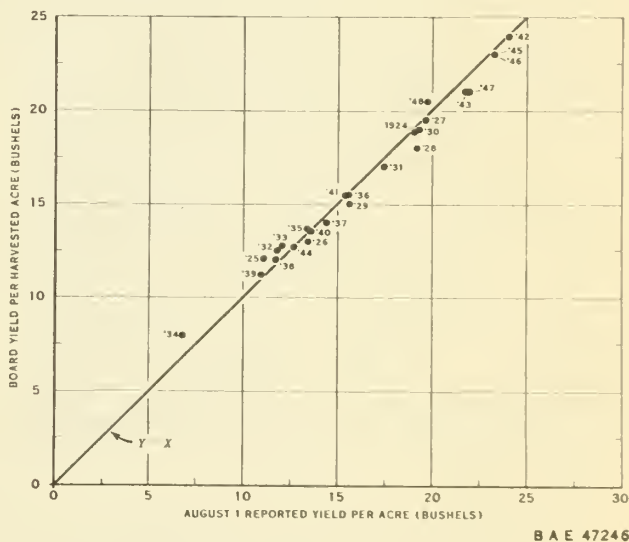
Figure 11.—Graphic regression chart used in August by the Crop Reporting Board to estimate yield per harvested acre of winter wheat in Nebraska from reported yields.

The general schedule indications relate to the crop reporter's judgment of average yields in his locality; the acreage and production indications are for his own farm. The two sets of indications are considered when arriving at the year-end estimate of yield, which is published in December.

When all of the check data for the production of a crop such as cotton, tobacco, sugar beets, rice, peanuts, or flaxseed, become available some months after completion of harvest, the official estimates of production are revised, if necessary, to bring them into reasonable relationship with the check data. In practice, a production estimate is always adopted which is the product of the latest acreage estimate and the yield, in the customary whole units or fractions of units in which yields are estimated. Although approximate production may be ascertained by check data, the final estimate is the product of acreage multiplied by yield per acre. The only exception is in the case of sugar beets, for which both acreage and production data are available from factories. These revisions are scheduled in advance. They are released at the same time every year—cotton, tobacco, and the sugar crops in May, peanuts in July, and broomcorn in August.

For such feed crops as corn, oats, and hay—in fact, for the majority of field and vegetable crops—production check data are incomplete, so ordinarily they are not used as a basis for revising preliminary production estimates. For such crops the major indications of yield or production, which are independent of the voluntary crop reporters' indications, are obtained from (1) the quinquennial census of agriculture, or (2) the annual State farm censuses in the few States in which production questions are included on the census questionnaire. In years other than Federal census years, in States that lack production data from an assessors' census, there is often no fully satisfactory independent indication of yield or production. Therefore there is little basis for revision of preliminary production estimates for these crops until the next quinquennial census confirms the estimates of level of yield or suggests a change in level.

FORECASTS OF YIELD AND PRODUCTION

One of the original statistical activities of the Department, from its founding in the 1860's, was the reporting of condition of crops during the growing season. Because of the impossibility of averaging nonquantitative statements such as "excellent", "good", "fair", or "poor", a numerical scale was adopted with 10 representing an "average" condition and lesser and greater numbers representing conditions

poorer or better than this "average." But it was hard to remember and combine into one composite average the condition of a given crop on a given date in recent and distant, favorable and unfavorable years. It soon became apparent that farmers had difficulty in visualizing an average condition. This was demonstrated by the fact that over a period of months or years the average of all reports of condition was somewhat less than 10, indicating that the crop reporters' composite idea of average condition actually was greater than the true average.

To get away from the use of an "average" that was rarely attained, the concept of a "normal" condition was substituted (about 1880) with 100 used to designate normal condition. It is generally defined as follows:

"A normal condition is not an average condition, but a condition above average, giving promise of more than an average crop. Furthermore, a normal condition does not indicate a perfect crop, or a crop that is or promises to be the very largest in quantity and the very best in quality that the region reported upon may be considered capable of producing. The normal indicates something less than this, and thus comes between the average and the possible maximum, being greater than the former and less than the latter. The normal may be described as a condition of perfect healthfulness, unimpaired by drought, hail, insects, or other injurious agency, and with such growth and development as may be reasonably looked for under these favorable conditions." [7] The conception of what constitutes a "normal" condition of a crop obviously varies from one locality to another with differences in soil and climate. It also changes slowly, over time, in the same locality, owing to changes in varieties, cultural practices, and soil fertility. Shifts in the acreage distribution of a crop within a State, from areas of low yields to areas of high yields, may mean that the same reported condition will indicate a higher yield than it once did, whereas an acreage shift in the opposite direction may have the reverse effect. The relative constancy of the aggregate of all the individual reporters' ideas of normal condition has greatly enhanced its usefulness.

As early as the 1880's some dealers in farm products began to interpret the reported condition of each major crop in terms of actual bushels, tons, or pounds of probable yield. The desirability of having such interpretations made by the Crop Reporting Board, and therefore available to all, rather than made by private individuals and available to a few, was pointed

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[7] The Crop and Livestock Reporting Service of the United States. See footnote 2, p. 4.

out by the Keep Commission [8] in 1906. In 1912 the Crop Reporting Board began to publish forecasts of yields.

The method used originally was the so-called par method, which assumes a proportional relationship between reported condition and final yield over the entire range of reported condition values. Letting C' represent currently reported condition, $\overline{C}$ the 10-year average condition on this date, $\overline{Y}$ the 10-year average yield, and Y' the most probable yield for the current season, the formula used was $Y' = C' \dfrac{\overline{Y}}{\overline{C}}$. This formula is based on the simple proportion $C':Y'::\overline{C}:\overline{Y}$. The value of the assumed 100 percent yield, $\dfrac{\overline{Y}}{\overline{C}}$, was calculated and published for each month, for each State, at the beginning of the season, so at crop-report time only the currently reported condition, C', had to be substituted in the formula before working out the solution for Y'. The inflexibility of the par method necessitated subjective modification of the condition index or of the pars, to eliminate the disturbing effect of highly atypical years and of trends in the data. The marked superiority of the graphic regression method of translating reported condition into a forecast of yield led to the abandonment, in 1930, of the par method of forecasting field and vegetable crop yields and the adoption of the graphic regression method. This method is described in chapter 5. One of the charts that was used on May 1, 1949 to forecast the yield of winter wheat in Nebraska on the basis of reported condition is shown in figure 12.

It should be clearly understood that *a forecast is a statement of the most likely magnitude of yield or production, on the basis of known facts on a given date, assuming weather conditions and damage from insects or other pests during the remainder of the growing season to be about the same as the average of previous years when reported condition on the given date was similar to the present reported condition.* The yield potentialities of the current condition may be appraised accurately, but if weather or other conditions between the date of the forecast and the time of harvest are not similar to those experienced in past seasons that have been used in the determination, the actual yield may differ somewhat from the forecast. As the season progresses the forecasts made at or just before the harvest merge into estimates of accomplished fact.

[8] Keep, C. H., Murray, L. O., Garfield, J. R., and Pinchot, Gifford, letter dated January 6, 1906, to the President of the United States, transmitting Senate Document No. 464, 59th Congress, first Session.
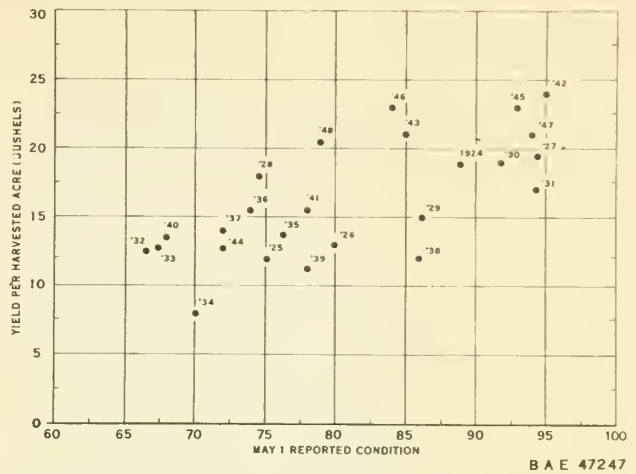
FIGURE 12.—Graphic regression chart used in May by the Crop Reporting Board to estimate yield of winter wheat in Nebraska.

The first forecast of the production of winter wheat is published, by States, about December 20 of the year previous to harvest, largely on the basis of reported condition as of December 1 and precipitation August through November. Monthly forecasts of production of winter wheat are made from April through August; monthly forecasts of yield of rye are begun in May; of oats, barley, and spring wheat in June; of most other spring-sown field crops in July; and of a few crops, including cotton, peanuts, sorghums, and broomcorn, as late as August.

The Crop Reporting Board does not forecast yield solely on the basis of reported condition and meteorological data. As a crop nears maturity, crop reporters are asked to estimate the probable average yield in their localities, and the averages of these crop reporters' forecasts are translated into yield forecasts by the Crop Reporting Board by means of regression charts in which "true" yields are plotted against reported probable yields.

When there is either an upward or a downward trend in yields over a period of years, crop reporters tend to lag in their appraisal of the situation. This occurred when boll weevils first invaded the cotton crops in the southeastern States, some 35 years ago. More recently, introduction of corn hybrids and some associated cultural practices so greatly increased the yields of corn that reported condition (evaluated by means of regression charts of yield on reported condition for previous years), fails to indicate the true yields unless proper allowance is made for trend. On individual farms, yields of corn may be increased as much as 25 or 30 percent by using hybrid instead of open-pollinated corn for seed and by

using the better cultural practices that are usually given to fields that are planted with the more expensive seed. When less than 10 percent of the corn in a State is hybrid the increase in the State average yield is insignificant. But when the percentage of hybrid increases rapidly to more than 90 percent, the rate of increase in yield is so great that crop reporters' ideas of condition and normal yield do not keep pace.

Detailed study of the situation indicated that (1) the use of hybrid seed is often related to other cultural practices which increase yield, (2) there is little correlation between reported condition and the percentage of hybrid corn, (3) the increase in the percentage of hybrid within the range of 10 to 90 percent tends to be a linear function of time.

As there was a time trend in yield not explained by condition, the most obvious solution of the problem was the use of multiple regression charts using condition and time as independent variables, as explained in chapter 5. However, the close relationship between the hybrid percentage and time permitted using the percentage of acreage seeded to hybrid instead of time. With little or no correlation between condition and the percentage in hybrid, the gross and net regressions of yield on condition were practically the same. Therefore, quantitative (bushel) deviations from the line of regression of yield on condition for prehybrid years could be graphically related directly to the percentage in hybrids and the yield increment for hybrid seed, read directly. This procedure requires only two simple charts and is now used for those States in which the percentage of hybrid corn ranges between 10 and 90.

Possibilities of using weather data to forecast and estimate crop yields have been investigated. Results to date have shown that the effects of weather factors are so complex that, in the United States, weather data alone do not provide a practical basis for estimating prospective crop yields per acre. But such data have been useful in adjusting crop reporters' appraisals of prospective yields. It has been discovered, for example, that for some crops crop reporters tend to overestimate prospective yields when rainfall is overplentiful, and to underestimate prospective yields when rainfall is below normal, at the time the reports are made.

The problem is to find a measure of the effectiveness of rainfall that is not properly reflected in the reported condition of a crop. Rainfall data have proved useful in connection with estimating the winter wheat crop, especially in areas where precipitation is very influential in determining the final yield. The best results have been obtained when the total rain-fall during certain months has been used in conjunction with some measure of the ability of the crop either to respond to additional moisture or to withstand deficient rainfall. A measure of this ability to respond is provided by the reported condition of the crop. It has been found that an index computed by multiplying the reported condition of winter wheat as of December 1 by the inches of fall precipitation (August through November in most States) provides a reliable indication for use in interpreting a yield per acre. For States in which the winter wheat crop matures early, the July-March precipitation is multiplied by April 1 reported condition to compute the index used on April 1. These computed indexes are charted against the board estimates of yield per planted acre to show the relationship in past years. This method is used currently as one indication in forecasting winter wheat production. (See figure 13.)


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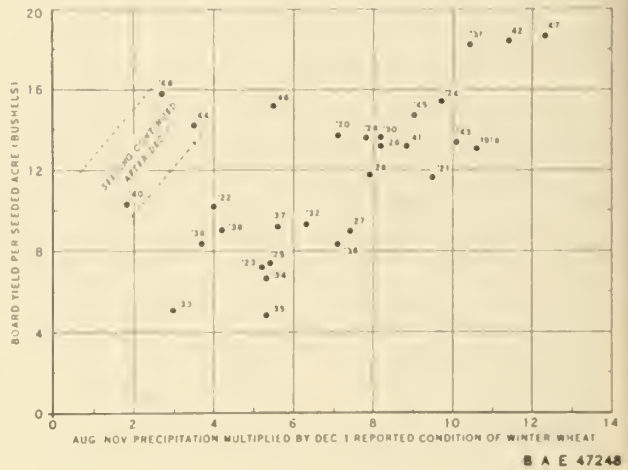
FIGURE 13.—Graphic regression chart used in December by Crop Reporting Board to estimate yield per seeded acre of winter wheat in Kansas from reported condition and August-November precipitation.

It is difficult to devise purely objective measurements of the effectiveness of rainfall, but pasture condition has sometimes been found useful. Ordinarily in wet seasons pasture condition is reported relatively higher than crop condition and in dry weather pastures suffer sooner and to a greater extent than do most crops, so reported pasture condition is relatively lower than crop condition. This makes it possible to use pasture condition to correct for at least some of the bias in reported crop condition. Even though reports of pasture condition itself are biased, that very bias may be used to help compensate for bias from the same cause in reported crop condition.

Use is made of the *difference* between reported crop condition and reported pasture, both being weighted by crop weights. Actually this is a special case of multiple regression analysis. Using C to indicate crop condition and P to indicate pasture condition, the statistic may take the form (C — P), which may be used graphically as a second factor. Or after analysis for a State it may be used to compute an "adjusted crop condition" of the form [C + (C — P)]. Also a plain ratio, C/P, or even P alone may be used in some crops. The essential point is that reported C and P behave differently in relation to effective rainfall. It should be remembered that at a particular date the yield residuals from the line of best fit on reported condition may be accounted for by developments that take place later in the season and so are not related to biased reporting. Use of pasture condition to adjust for bias in reported crop condition seems to apply particularly to some crops in the States east of the Mississippi River where rainfall may be more than optimum for a given crop.[9]

A very promising approach to estimates or late forecasts of yield is through the use of objective plant measurements, or the complete harvesting of very small objectively selected areas, immediately before the usual harvest. These objective surveys of yield are described briefly in chapter 5.[10]

One of the most interesting variations from the general scheme of yield and production forecasts is used for making forecasts of production of the great cash crop—cotton.

Ten years ago it was the practice to forecast yield per acre, by States, from the various indications, and to multiply this yield by the estimated acreage for harvest, when computing the indicated production. The estimated acreage for harvest was the estimated acreage in cultivation on July 1 minus estimated abandonment. In 1943 a study was made of ways to reduce the time and labor in doing this work, with the possibility of improving the forecasts at the same time. The outcome of that study is the technique now used.

As yields of cotton per acre in a State tend to be inversely correlated with the total acreage over a period of years, it is reasonable to assume that the effect of acreage on yield should be taken into consideration. Indexes of production are computed by multiplying estimated acreage for harvest by the current indications of yield, and these indices are plotted against final production on regression charts. Early in the season the indications of yield are: Reported condition, probable yield, bolls safe per plant, size of bolls, and percentage of full stand.

Production indexes based on condition are computed by multiplying reported condition by a weighted 10-year average par yield (that is 100 percent yield) to obtain an indicated yield, and then multiplying that yield by acreage. Index of production = (condition × 10-year average par yield) × acres. The condition and acreage are current, but the par yield is historic, being derived from actual yield and November 1 condition for 10 individual past years. Because reporters usually remember recent seasons better than those 5 or 10 years back, pars for recent years are given extra weight. An index of boll-weevil infestation is a useful second independent variable to correlate with the residuals from the production index derived from condition.

In October, November, and December, an estimate of cotton production that is entirely independent of the acreage and yield indications used in August and September is obtained from reports made by ginners. Ginners are requested to report as of the first of the month the number of bales ginned to date and the number of bales expected to be ginned during the remainder of the season. From these data, the percentage of the crop ginned to date is computed, and is then correlated with percentage ginned to that date as reported by the Bureau of the Census at the close of the season. To use this estimate percentage ginned, it is necessary to have a tentative estimate of the number of bales ginned to date, as the census report of the number of bales ginned to date is not available until about an hour before release of the report.

The tentative estimate of current ginnings is obtained by matching current gin reports with those from the same gin of a preceding date for which the total number of bales ginned is known, and expanding the sample to 100 percent by crop reporting districts. These ginners' data are combined into an index of production (estimated ginnings to current date / estimated percentage ginned) with a correction for inter-State movement of seed cotton and bale weight. This index of production is then correlated with production. Figure 14 shows the relation of the ginners' production index in Alabama on November 1 to actual production. The current report on total census ginnings to date, which is released simultaneously with the cotton report, is brought to the Crop Reporting Board about an hour before the combined report is

[9] Marsh, John F. The use of adjusted condition for estimated yield per acre. Jour. Farm Econ., 29:541-546, 1947.

[10] For more complete descriptions see (a) King, A. J., and Jebe, E. H., footnote 4, Ch. 5; (b) King, A. J., McCarty, D. E., and McPeek, Miles, footnote 5, Ch. 5; (c) McCandliss, D. A. Objective sampling in estimating southern crops. Jour. Farm Econ., V. 23, No. 1, 1941.

released and changes in the production esti-
mates previously adopted are made by the Crop
Reporting Board in accordance with the differ-
ence between actual ginnings and those already
estimated by the Board from a sample of the
gins. Normally the adjustments are compara-
tively small and have to be made in only a few
States.

SUMMARY

Virtually all forecasts of yield of field and
truck crops are based on the condition or prob-
able yield reports obtained from voluntary mail
surveys. Yield estimates of most crops are based
on similar voluntary reports of yield, except
that independent processing or marketing in-
formation, of varying degrees of completeness,
furnish an independent basis for production
estimates in the case of a few crops. Data on
cotton ginnings are utilized for late-season fore-
casts of production and for season-end esti-
mates. Objective estimates or forecasts of yield
are of value as supplemental indications of yield
levels, but have not been used systematically in
the United States to replace other methods.
Meteorological data supplement rather than re-
place more direct indications of probable yield.

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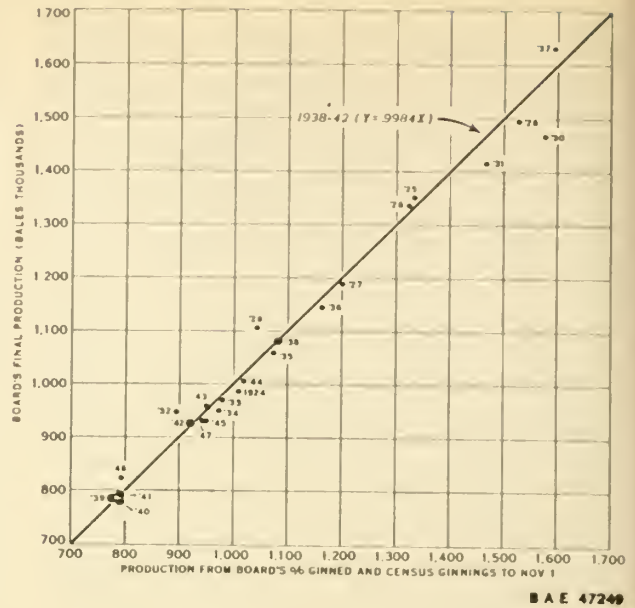
FIGURE 14.—Cotton production, Alabama: Relation of
final official estimates to quotient of ginnings reported
by the Bureau of the Census to November 1, divided by
estimated percentage ginned to November 1, 1924-47.

By Harold R. Walker, C. E. Burkhead, Thomas J. Kuzelka, George B. Strong, and Robert F. Gurtz

The methodology of estimates of acreage, yield, and production of major field crops was discussed in chapters 5, 6, and 7. The Crop Reporting Board prepares estimates of production and stocks of field and vegetable seeds, estimates of acreage and production by varieties for some major crops of which different varieties are suited to specific uses, estimates of farm disposition covering sales and farm uses, and estimates of stocks of major crops on farms and in various off-farm positions. These are published by the Bureau of Agricultural Economics. Estimates of farm disposition and stocks are not only useful directly; they have utility as check data upon production estimates. For some crops preparation of these estimates is a basic step in establishing estimates of production.

SCOPE OF ESTIMATES OF LEGUME, GRASS, AND COVER-CROP SEED

Before 1939, the Crop Reporting Board made annual estimates for only six seed crops—alfalfa, red and alsike clover (combined), sweetclover, lespedeza, and timothy. These estimates were based largely on indications obtained from the Rural Carrier surveys and the same methods of estimating were employed as for general field crops. These were explained in chapters 5 and 6; the indications used were ratios to land, current/historic, and identical relationships. Largely to meet the demand for more seed statistics and to avoid duplication of work, all seed-statistics work of the Department was consolidated under the Crop Reporting Board in September 1938. By 1947, the scope of reports on seed crops had broadened to include, besides the six seeds named, the following field seeds: lupine, bromegrass, crested wheatgrass, crimson clover, Ladino clover, meadow fescue, orchard grass, redtop, Sudan grass, white clover, Austrian winter peas, common rye grass, perennial rye grass, common and Willamette vetch, hairy vetch, Hungarian vetch, purple vetch, Bermuda grass, sunflower, and mustard seed. Seed crops are usually grown in specialized areas and special sampling is necessary to obtain dependable indications of acreage change and yield per acre.

ESTIMATING ACREAGE, YIELD, AND PRODUCTION OF FIELD SEEDS

Two reports pertaining to acreage, yield, and production of each kind of field seed are prepared annually—a forecast report and an estimate of actual production. Data for the forecast report are obtained at the time a given kind of seed is harvested; data for the estimate of production are obtained mostly after harvesting has been completed. Of the two reports, the first is the more important because it furnishes more timely information. Two schedules, one sent to growers and the other to shippers, are used in making forecasts of seed crops. The schedules are designed to supplement each other. From them are obtained indications of annual changes in acreage harvested, yield per acre, loss in cleaning, average date of beginning of harvest, carry-over of seed on farms, and opening prices to growers.

The December estimate is designed to revise, if necessary, the estimate given in the forecast report. As a rule it is based on a larger sample obtained at a much later date than the forecast. This December estimate, however, is regarded as preliminary until the following year, when check data relating to acreage or production become available.

For the few seed crops for which federal census data are available (three in 1944 and five in 1939) crop check data, as well as data reported by surveys, are related to the census bench marks. Departures from these census bases are made only when check data exceed the census data or they are in such close agreement with the census data that the addition of other known items of disposition, such as farm use and farm sales, indicate that the level of the estimates should be higher than is shown by the census. Lacking census data to serve as bench marks, seed estimates are related to such check data as State assessors' enumerations of acreage and/or production, railroad shipments, purchases by country shippers and dealers, loans or purchases made by the Government, acreage and production totals of certified seed, and totals of seed verified as to origin.

ESTIMATES OF VEGETABLE SEEDS

Three vegetable seed surveys—on March 15, June 30, and December 1—are made annually. Data obtained in each of these surveys are:

March 15—Final acreage and production for the preceding year and prospective acreage and production for the current year.

June 30—Stocks of vegetable seeds carried over by seedsmen on June 30.

December 1—Preliminary estimate of acreage and production for the current year.

In order to obtain data for more than 250 kinds, varieties, and types of vegetable seeds, many of which are grown for export or other specific uses, the schedule is of necessity long. Vegetable seedsmen, however, insist that detailed information by varieties is as important as totals for a particular species.

The mailing list of vegetable seed growers includes all known growers in the United States. The names were furnished by the seed industry, and the list is kept current. A 95-percent response to the survey is usually obtained by use of the mails, telephone, or telegraph.

ESTIMATES OF SEED CARRY-OVER

Carry-over of old seed on farms is estimated largely from data obtained from the schedules on which production forecasts are based. The general procedure in computing farm carry-over is to determine what percentage the quantity of seed carried over by the growers (farmers) reporting in a given State is of the total quantity of this seed produced by these growers in the preceding year. This percentage, with possible minor adjustments suggested by other data such as those obtained from disposition surveys, is applied to the State production estimate for the preceding year. Generally speaking, the farm carry-over constitutes only a small fraction of the total carry-over in all positions, because most of the surplus seed is sold by growers during the first 6 months following harvest. The major portion of the carry-over of old seed usually is held by dealers.

Dealers' carry-over stocks as of June 30 are obtained from a mail survey. Schedules are mailed to every firm known to have carried over important quantities of a given kind of seed in past years. The schedule is designed to furnish a cross-check of seed owned or controlled by other firms but stored in the reporter's warehouse. These surveys were inaugurated in 1940, and during the last 8 years returns have averaged more than 90 percent of the commercial stocks. This degree of completeness requires much follow-up effort by mail, telegraph, and telephone. All stocks owned or controlled by the Government are included in the consolidated report of stocks held by "dealers and the Government."

DATA BY TYPES OR VARIETIES

Estimates for some crops are made separately for each principal classification or type, which are then added to obtain the State total. For example, in the case of tobacco, sales data and reports from growers are sorted by areas within States, according to the predominant type grown in the area. Each type is then handled as a separate crop. These data by types can then be summarized in two ways. Estimates for the same type from several States may be added to obtain the total for each type; or all types within a State may be added to obtain the State totals. The estimates are published both ways.

Estimates of dry beans and dry edible peas are prepared on the basis of varieties, inasmuch as the different varieties have different uses and consumer preferences. Also, each variety may respond differently to weather and other growing conditions.

Surveys of the acreage of wheat seeded to various varieties are made at intervals of 5 years. From the survey data, estimates by States are made of the acreage of each variety and of production of wheat by classes. In some States such surveys are made annually, as in Kansas where county estimates by varieties are available as a part of the program supported by State funds. Questionnaires are mailed to large lists of wheat growers, asking total farm acreage, variety or varieties of wheat grown, and acreage of each variety. Tabulated on a county and district basis, the percentage that each variety is of the total acreage of wheat is computed and weighted out to State averages. These State percentages, applied to the State acreage of all wheat, result in estimates of the acreage of each variety. Similar variety surveys have been made recently for barley in important North Central States, and a number of States have surveyed the varieties of soybeans grown within their borders. Periodic estimates of production of white, yellow, and mixed corn are made. Currently, the percentage of the total corn acreage planted to hybrids is estimated on the basis of information collected through mailed surveys and sales data from the seed houses. The information is helpful in estimating yields, as well as in supplying trade demands for such data.

In the case of vegetable crops for processing, snap beans are broken down into green and wax varieties. Estimates of sweet corn are made for four different categories—Evergreen and Narrow Grain, Country Gentleman, Bantam and other yellow varieties, and other varieties. Green peas are divided into sweet wrinkled varieties and round smooth varieties. Similarly, estimates of cabbage for fresh market are separated into domestic types and Danish (storage) types.

FARM DISPOSITION AND VALUE OF PRINCIPAL CROPS

A report covering the farm disposition and value of principal crops is issued early in May

of each year. In general, each annual report contains preliminary estimates of quantities fed and used for seed on farms where grown, and quantities sold and for sale during the remainder of the crop-marketing season, as well as revisions of preliminary estimates for the previous crop season. As revisions of production estimates are made following each Census of Agriculture, it also becomes necessary to prepare and publish revised disposition estimates.

Basic data for these estimates are obtained by a variety of means, differing by commodities. For feed grains and hay, paired questions on the March 1 General Schedule, covering each commodity, ask for individual farm data as to production and quantity sold or to be sold (see C.E.2—8795 G, Appendix D). From these reports quantities sold are converted to percentages of production. Over a period of years these survey questions have evolved from judgment questions of the percentages shipped out of county, and, later, of the percentage sold. In the case of corn, a special disposition survey at the end of the marketing season in October was used for a period of years, including the years when Government loans involved significant portions of the production.

For purposes of interpretation, the indicated percentage of production sold is converted to an indicated quantity sold. Currently indicated quantities sold are then compared with the quantity indicated by the season's supply on a chart showing the regression of previous seasons' sales on supply. The supply of any commodity is made up of the carry-over stocks on farms at the beginning of the marketing season plus estimated new production. Sales are highly correlated with supply, so that for States in which samples are stable, indicated sales from the survey agree well with the chart readings. For States that have relatively unstable samples the chart supplies a stabilizing influence. Original bench marks for these estimates were data obtained in the 1909 and 1919 censuses. In the interpretation process, livestock numbers, prices, and supplies of other feeds also are given consideration as factors affecting quantities sold.

For oats, barley, and sorghum grain, the published estimates of disposition show, in addition to production and quantity sold, quantity used for feed and seed. The sum of the disposition items equals production. The quantity used for seed is computed by applying an estimated seeding rate for the following year's crop to the estimate of acreage planted the following year. Disposition estimates for hay cover quantity sold and quantity kept on the farm. Disposition items for corn are quantity sold, quantity used for feed and seed, and quantity for farm household use. The latter item is negligible for most commodities other than food grains, potatoes, and sweetpotatoes, but in computing gross farm income from corn it is a factor. The rate of home consumption per farm growing corn is derived from current questions on the June 1 General Schedule for the Southern States, where home use of corn is important. For other areas, in which consumption of corn for food is relatively unimportant, the rate is checked every few years by mail surveys, but it is so small per farm that year-to-year changes are not normally significant.

The per farm rate of home consumption is applied to the estimated number of farms growing corn in each State to obtain the quantity for home use. The number of farms harvesting corn is obtained from assessors' annual farm censuses in some States. In other States the number of farms growing corn is estimated from trends on time series charts on semi-logarithmic graph paper on which the relationship between acreage of corn and number of farms growing corn, as enumerated in each census, is projected through intercensal periods.

The approach used in the case of the food grains (wheat, rice, rye, and buckwheat) and soybeans is to estimate directly from survey data quantities fed on farms and those used for seed. Quantities used in farm households are also estimated directly. As the major portions of these crops are sold, quantities otherwise disposed of are deducted from production and the residual is considered to have been sold. These quantities are checked against other information relating to quantities that leave the farm and enter commercial channels. For example, receipts of rice at all rice mills are obtained by State of origin annually. They are used as a check against sales and also with other disposition data as a check against production estimates.

Estimates of farm disposition of such crops as wheat, buckwheat, and soybeans are prepared from individual farm data obtained by special disposition questionnaires for each commodity. These special disposition schedules are mailed at or near the end of a crop-marketing season to selected lists of farmers who grow each specific commodity. Estimates are on a crop-year basis; they relate to disposition on farms where the particular crop is produced.

The end-of-season disposition surveys obtain basic data from individual farmers who report, for their own farms, production, carry-over stocks, and purchases. These items make up the total supply. Another set of questions asks for quantities used for seed, for livestock and poultry feed, food, sales, and end-of-season or carry-out stocks. (See C.E. 2–8465, Appendix D). Questions as to acreage planted and quan-

tities of seed used provide information used to establish the seeding rate per acre. This rate per acre is applied to the planted acreage in the current year to obtain the quantity from the previous year's crop used for seed. The survey also provides a basis for estimating seed used on farms where produced, or home-grown seed. Quantities used in the home for human consumption and those used for feed are derived from reported quantities used for these purposes. Quantity sold is total production less amounts used for seed, feed, etc. Estimated sales thus include all sales whether from farm to farm or to dealers.

In addition to final estimates of disposition, which are made on completion of the crop-marketing season, preliminary estimates are made earlier. To aid in preparation of the preliminary estimates, questions are asked on the February General Schedules as to quantities fed to livestock and poultry for crops such as wheat and soybeans. Paired questions ask for production the previous year and quantity fed or to be fed on the individual reporter's farm from that crop. From these reports the percentage of production fed is computed; it is used as an indication which is interpreted on a chart showing past relationships with the final estimates. Preliminary estimates of seed used are made by multiplying total acreage of a crop, whether planted or to be planted, by a standard rate of seeding. Other items are estimated from charted relationships in previous years, in addition to any current data which may be available such as sales, by months, of the specific commodity.

Estimates of farm disposition of most other principal commodities are prepared from individual farm data obtained by special disposition schedules for each commodity. These special disposition survey schedules are mailed to selected lists of farmers who grow each specific commodity, as the estimates refer to disposition of each commodity on the farm where grown. Methods of expanding indications into estimates of farm disposition and value of flaxseed, popcorn, cowpeas, peanuts, velvetbeans, hops, dry edible beans and peas, seeds, broomcorn, sorghum and sugarcane sirup, maple products, potatoes, and sweetpotatoes, are virtually the same as those described for either the feed or food grains.

For potatoes in the 37 late and intermediate States, preliminary estimates of disposition of the last year's crop and revised estimates of disposition of the next previous year's crop are published in January as a part of the report on January merchantable potato stocks. Estimates of disposition are incorporated in the stocks report as this series of estimates relates only to "merchantable" stocks. The trade is primar-

ily interested in the quantity of potatoes expected to move into commercial channels. Therefore, it is necessary to estimate sales for the season and to determine the proportion of such sales that are expected to be made after January 1.

Preliminary estimates of disposition are based on a mailed survey of individual farms about January 1 and the revised estimates are based on an end-of-season (about June 1) survey. In making the January 1 inquiry, growers are asked to estimate the probable disposition of the last year's production whereas the uses actually made of the crop are reported by growers on the end-of-season inquiry (C.E. 2–8493, Appendix D).

Disposition samples usually relate predominantly to the commercial crop, and allowance for this selectivity must be made in appraising sample indications as the disposition patterns for "commercial" and "farm" crops vary considerably. Reported percentages of the crop fed to livestock and lost through shrinkage and waste are charted against the percentages adopted for these items for earlier years. The estimated quantity of potatoes used for food on farms where grown is determined from an estimate of the number of farms harvesting potatoes during the last year and the average quantity consumed per farm, as indicated by reported consumption per farm from the sample.

Total seed requirements are estimates from acreage planted and adopted rate of seeding. Growers report the quantity of their last year's production used for seed and the quantity of seed bought to plant the current year's acreage. From these quantities an estimate of the percentage of seed used on farms where grown is determined and this percentage is applied to estimated total seed requirements of a State to determine the quantity of potatoes used for seed on farms where grown. Estimates of quantities sold are the residuals after subtracting from production estimated quantities fed to livestock, lost through shrinkage and waste, and used for food and seed on farms where grown. These residuals are checked against recorded movement and any other available information on quantities entering commercial channels.

MONTHLY SALES OF GRAINS AND OILSEEDS

Information as to monthly sales of grains and oilseeds is obtained chiefly from special surveys of monthly purchases by mills, elevators, and dealers who buy directly from farmers. Schedules are mailed to these dealers about July 1 for small grains and about October 1 for corn, sorghum grain, and soybeans, asking

for their individual purchases of each commodity in each month of the marketing season just completed.

Information obtained from dealers is summarized by crop reporting districts and converted to percentages of total annual receipts purchased each month. These percentages are weighted by indicated quantities sold in each district. Time charts are maintained for each commodity in each State. If the currently reported monthly marketing percentages vary widely from the usual pattern, comparisons with such data as rail shipments, receipts at principal markets, and farm stocks and quantities under Government loan are likely to suggest whether indications of monthly sales are representative.

Information from dealers concerning their receipts has been found more satisfactory in estimating monthly sales than has information from farmers on their sales, as individual farmers usually make only a few sales of an individual commodity during a year. Reports covering large quantities of farm products are more easily obtained from dealers than from farmers. Chief exceptions to this generalization are potatoes, sweetpotatoes, and hay. For hay, a special disposition and monthly sales card schedule is used to obtain such information directly from farmers. Both individual farm data and movement records are considered in estimating the distribution by months of sales of potatoes and sweetpotatoes.

VALUE OF SALES AND VALUE OF PRODUCTION

The value of sales for each crop is the estimated quantity sold multiplied by the season average price per unit of measure. Similarly, value of production and value of home consumption are obtained by applying the season average price per unit received for the portion sold to total production and to home consumption, respectively. In most cases, the season average prices are the estimated mid-month prices, weighted by the estimated quantities sold in each month of the crop-marketing season.

ESTIMATES OF STOCKS

Quarterly reports on stocks of farm commodities, both on farms and in commercial storage off farms, now form one of the more important phases of crop reporting. At present the Crop Reporting Board undertakes to cover farm stocks and stocks in all off-farm storages not covered by other agencies. The Bureau of Agricultural Economics publishes these data in integrated reports covering stocks in all positions of corn, wheat, oats, barley, rye, soybeans, flaxseed, and sorghum grain.

Estimates of farm stocks of wheat and corn on March 1 were begun in 1883, and estimates of oats and barley were added later. Between 1895 and 1909 the series of farm stocks of corn, wheat, oats, barley, and hay at the end of each season were instituted. Beginning in 1926 these were superseded by the current quarterly series of farm stocks of corn, wheat, and oats. Barley, rye, and soybeans were added later and in 1947 experimental work was undertaken leading to addition of flaxseed and sorghum grain. Farm stocks of hay are estimated as of January 1 and May 1 each year.

After a period of evolution beginning with the first estimates of wheat stocks in mills and elevators on July 1, 1919, a point has now been reached at which quarterly reports on stocks of most grains in all off-farm positions are prepared. This involves integrating some enumerations made by other agencies with estimates of the Crop Reporting Board. Stocks of oilseeds at processing plants are enumerated monthly by the Bureau of the Census. Processors' stocks of soybeans and flaxseed on quarterly dates are obtained, by States, from the Bureau of the Census and incorporated in the report on stocks in all positions. Similarly, commercial stocks of grains at terminal elevators in about 40 cities are reported weekly by another agency of the Department; such stocks for the weekly date nearest the quarterly date are incorporated in total estimates of grains in all positions.

The basic data for estimates of most farm stocks are obtained on the General Crop Schedules from monthly crop reporters as of the periodic dates. Reporters are asked paired questions—one asks production of each commodity, the other quantity on hand as of the date of the questionnaire. These reported stocks on hand are converted to percentages of production, then expanded into quantitative estimates, by States, by applying an adopted percentage to estimated production. In adopting percentage stocks the reported percentage is marked on a time-series chart which also indicates percentage disappearance by quarters. The difference between the percentages from one quarter to the next is disappearance in terms of percentage. The quarterly percentages for each crop-year constitute a separate line (differentiated by color) which more or less parallels lines for previous years (fig. 15).

Another type of chart used in estimating stocks shows percentage stocks on a vertical line for each crop-year (fig. 16). This type has certain advantages as more years may be shown and unusual differences in data from quarter to quarter and from year to year are easily seen, as are also unusual departures from usual trends.

In most instances the percentage stocks de-
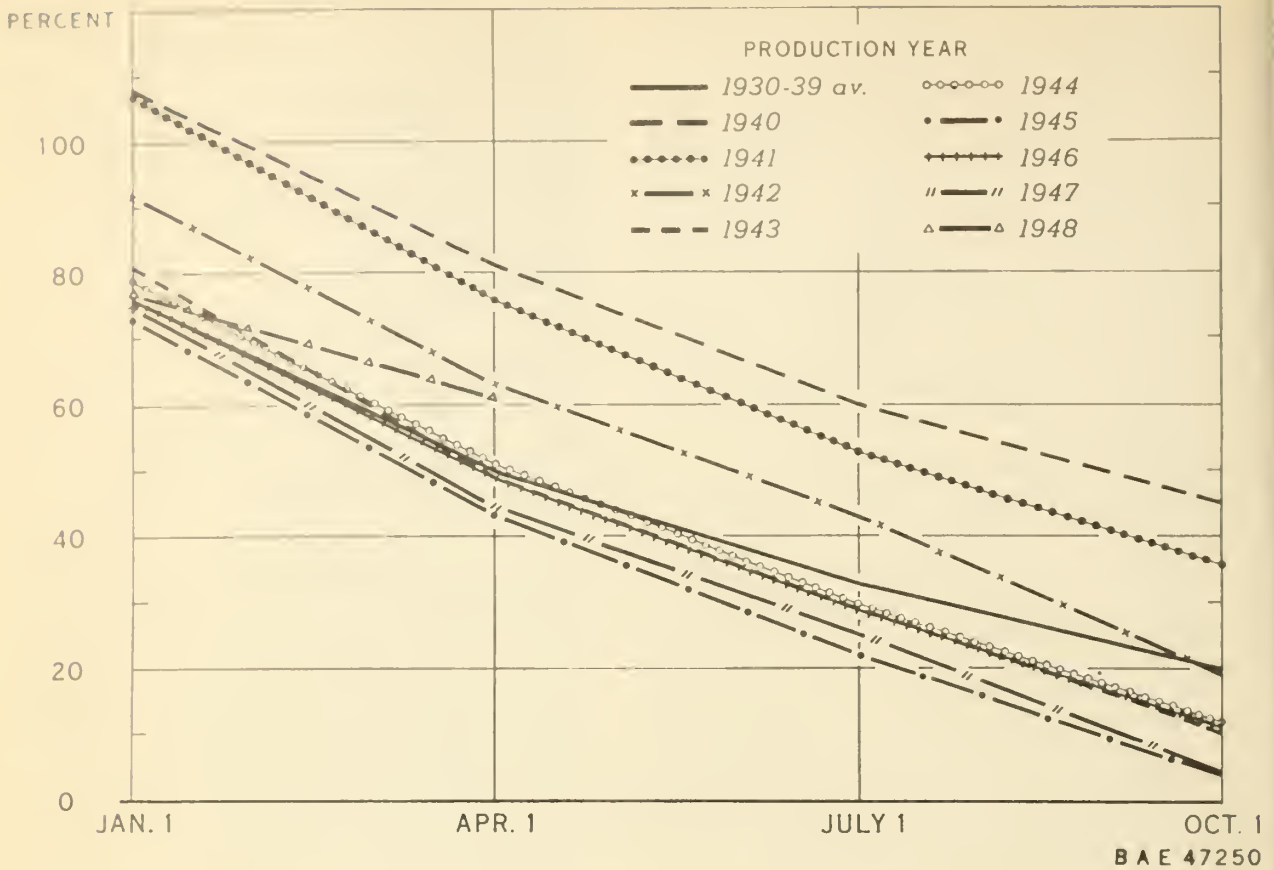
FIGURE 15.—Corn for Grain, Iowa: Stocks on farms as percentage of production, quarterly, 1930-39 average and 1941 through 1949.
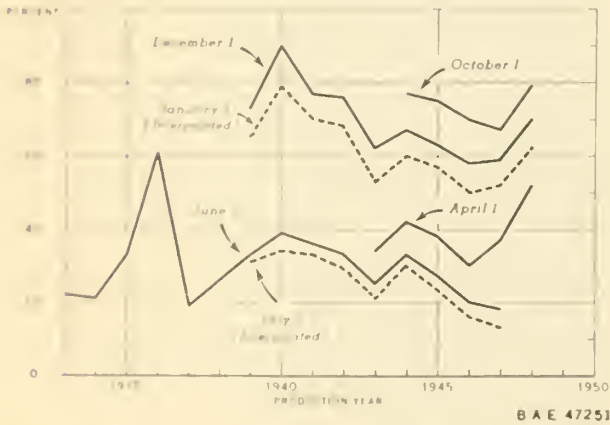
FIGURE 16.—Barley, North Dakota: Stocks on farms as percentage of production, selected dates, 1933-48.

rived from sample data are adopted, but if an unusual situation is apparent, further study is made of reported data by crop-reporting districts. This may indicate the necessity for adoption of one or more district percentages in line with other districts, or the same districts in

other years, because of faulty or inadequate reported data. Such tests as are applicable have indicated that the biases inherent in the type of sample have not materially affected the representativeness of the sample.

In January 1948 data relating to farm stocks, along with other data, were obtained by mail from a systematically drawn sample of farms which had been visited by interviewers on April 1, 1947. Data reported in January 1948, were expanded by methods used for the interview survey and they corroborated estimates prepared in the usual way. In April 1948, various follow-up samples by mail and mail surveys of totally independent lists of farms in certain States gave results that substantiated current Board estimates. These studies were undertaken because of the absence of bench marks to set the level of estimates of farm stocks.[11]

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[11] Scholl, J. C., and Burkhead, C. E. Interviewing nonrespondents to a mail survey: an experiment in connection with April 1948 farm stocks report, U. S. Bur. Agr. Econ., Econ. Research 1 (I):16-23. January 1949.

Stocks of grain in commercial off-farm storages are obtained on a sample basis by special schedule. Basic to the sampling and expansion processes are a complete enumeration of capacity of all off-farm storage plants in each State as of February 1942 and April 1943. The latter date marks the beginning of estimates in off-farm positions for commodities other than wheat. Constant efforts are made to keep the lists and capacity data current. Lists are divided into several groups of related plants, such as merchant mills, oilseed processors, elevators and warehouses, and other storages. In some States the miscellaneous "other storages" group is further broken down into feed mills, breweries, distilleries, bean plants, and the like, to facilitate the process of expanding reported data to an estimate. In many instances, it is possible to obtain complete coverage of one or more of these groups, limiting the field to which expansion methods must be applied.

Expansion processes used currently involve separate tabulation and summarization of the reports for each group of plants in the State. As the number and aggregate capacity of all the plants in each group are available, the expansion process for each group is simply a mechanical computation. The formula is:

$$\frac{\text{Reported capacity}}{\text{Total capacity}} = \frac{\text{Reported stocks}}{\text{Total stocks}}$$

in which the computed total stocks become an indication upon which the estimate is based.

A refinement of this expansion process which is commonly called the "regression method" has been discussed in detail in chapter 5. The actual sequence of calculations, using data for an individual State, follows:

1. Group universe: (a) Number of plants, 632. (b) Rated capacity, 4,447,000 bu. (c) Capacity for plant, b/a = 7,028 bu.

Item	Current Sample Data		
	Total all plants (d)	A—large plants (e)	B—small plants (f)
2. Number of plants...........................	177	111	66
3. Number reporting stocks.....................	152	97	55
4. Established rated capacity..................	2,307,000	2,048,000	259,000
5. Stocks on hand.............................	297,861	261,863	35,998
6. Capacity per plant 4/2.....................	13,034	18,450	3,924
7. Stocks per plant 5/2.......................	1,683	2,359	545
8. Percent capacity coverage 4/1 (b)..........	51.9	......	......
9. 100 percent stocks computed 5(d)/8.........	573,913	......	......
10. Difference in average capacity 6 (e) — 6(f).......	14,526	......	......
11. Difference in average stocks 7(e) — 7(f)..........	1,814	......	......
12. Regression coefficient 11/10..............	.12488	......	......
13. Difference between population and sample average capacity per plant 1(c) — 6(d).................	— 6,006	......	......
14. Adjustment for stocks per plant 13 × 12...........	— 750	......	......
15. Adjusted stocks per plant 14 + 7(d).............	933	......	......
16. Indicated stocks 15 × 1(a).................	589,656	......	......

The computations in column (d) items 2 through 9 of the accompanying tabulation illustrate the usual expansion method. In this case the expanded indication—item 9—agrees fairly closely with the expanded indication from the regression method—item 16. A third indication is obtained by multiplying average reported stocks per plant by number of plants, 7(d) × 1(a) = 1,064,000. The regression indication is regarded as eliminating much of the error that arises from the obvious skewness of the sample shown. The average capacity per plant in the sample is 13,034 bushels, compared with an average of 7,028 bushels for the 632 plants in the State. To obtain the estimate of stocks in all off-farm storages in the State, the estimate for the group here illustrated is added to the estimates for each of the other groups, obtained in a similar way or by enumeration.

TABLE 1.—*Estimates of Stocks Coverage*

Commodity	Position	Frequency [1]	Current series began	Availability (X)	
				By States	For United States
Corn and oats.....	On farms	Quarterly	1926	X	X
	Interior mills, elevators and warehouses....	do	1943		X
	Terminals [2]	Weekly	1927		
	All off-farm [3]	Quarterly	1943	X	X
	All positions [4]......................	do	1943		X
Wheat	On farms	do	1926	X	X
	Interior mills, elevators and warehouses....	do [1]	1935	X	X
	Merchant mills	do	1945	X	X
	Terminals [2]	Weekly	1926		X
	All off-farm [3]	Quarterly	1945	X	X
	All positions [3]	do	1945	X	X
Barley and rye....	On farms	do [5]	1944	X	X
	Interior mills, elevators and warehouses....	do	1943		X
	Terminals [2]	Weekly	1927		X
	All off-farm	Quarterly	1945	X	X
	All positions	do [5]	1943		X
Soybeans	On farms	do	1942	X	X
	Interior mills, elevators and warehouses....	do	1942		X
	Terminals [2]	Weekly	1942		X
	Processors [6]	Monthly	1942		X
	All off-farm	Quarterly	1945	X	X
	All positions	do	1943		X
Sorghum grain ...	On farms	Oct. 1 & Jan. 1	1947	(Oct.)	X
	Interior mills, elevators and warehouses....	do	1947	(Oct.)	X
	Terminals [2]	Weekly	1944		X
	All off-farm	Oct. 1 & Jan. 1	1947	X	X
	All positions	do	1947		X
Flaxseed	On farms	Quarterly	1947	(Oct.)	X
	Interior mills, elevators and warehouses....	do	1947	(Oct.)	X
	Terminals [2]	Weekly	1927		X
	All off-farm	Quarterly	1947		X
	All positions	do	1947		X
Hay	On farms	May 1	1909	X	X
	On farms	January 1	1938	X	X
Potatoes	Growers' and dealers'..................	do	1919	37 States	X
	Merchantable stocks	March 1	1943	18 States	X
Cabbage	Growers' and local dealers'.............	January 1	1928	X	X
Onions	Growers' and local dealers'.............	do	1928	X	X
Peanuts	Commercial	Monthly	1938	(Areas)	X
Naval stores	Central gum stills, wood plants, and southern concentration points...................	Monthly	1943		X
	Production and industrial plants, and southern concentration and distribution points...	Quarterly	1942		X

[1] Quarterly dates are January 1, April 1, July 1, and October 1.

[2] Collected and published by Grain Branch, Production and Marketing Administration.

[3] Includes Commodity Credit Corporation holdings outside the positions named above.

[4] Stocks in these plants available on July 1 since 1919; on April 1 since 1931; on October 1 since 1934.

[5] Farm stocks of barley and rye available, by States, on July 1 and January 1 since 1939; on April 1 and October 1 since 1944. For United States only, available since 1940.

[6] Enumerated by the Bureau of the Census.

Stocks of peanuts and naval stores are obtained by mail. Because of the excellent cooperation of the business firms involved, practically a complete enumeration is possible. Stocks of merchantable potatoes held by growers on January 1 are estimated from sample data obtained from the special preliminary disposition and stocks schedule (C.E. 6–38, Appendix D). In States in which local dealer holdings are significant, a special survey is made to determine such holdings. Dealers report the capacity of off-farm storages, total quantity and quantity of potatoes in their storage that will be marketed after January 1 for all purposes. However, only the combined holdings of growers and dealers are published. A second indication used in estimating merchantable potato stocks is obtained by subtracting from estimated season sales the marketings before January 1, as indicated by recorded movement.

The comprehensive series of estimates of stocks of grain, oilseed, hay and other commodities now in process of preparation cover stocks in all positions, on and off farms. These are listed in table 1 which shows the commodities, positions, and periods covered.

By REGINALD ROYSTON, IRVIN HOLMES, CLARENCE O. PARKER, GEORGE B. STRONG, and THORLAND HALL

DEFINITION OF COMMERCIAL CROP

Estimates of vegetable crops for fresh market cover mainly those crops grown in areas in which they are produced in substantial quantities for shipment, either by rail or truck, to more or less distant markets. The estimates do not include produce from family gardens nor from strictly market gardens near cities or towns. Production estimates for fresh market vegetables represent the total quantity produced on the commercial acreage, regardless of whether the entire crop was actually marketed. Hence, the quantities estimated for fresh market include production which may have been totally abandoned or only partially harvested because of low prices or other economic factors. However, acreages lost or abandoned from natural causes are not included in the estimates.

Complete statistics are not available on production of vegetables in local-market areas, although this production may comprise as much as a third of the total output of fresh-market vegetables of the country. The expense involved in estimating for local-market areas is so great that it has been impossible, so far, to tackle the problem systematically.

Experimental studies were started recently in the New York City area and in Massachusetts. A complete enumeration has been made of the acreage and production of each vegetable crop grown for sale in 10 counties in the New York City area. The bench-mark data thus obtained will serve as a basis for exploratory studies of sampling procedures which are particularly adapted to this type of enterprise and which would lead, at a reasonable cost, to satisfactory estimates of total vegetables grown for sale. Such analyses are now under way. A survey to obtain similar information in Massachusetts is in operation.

Separate estimates are made of 11 vegetables for commercial processing. These estimates include quantities for commercial canning, freezing, and other processing exclusive of dehydration, but do not include quantities canned in homes. Quantities used for commercial dehydration are included in the estimates for fresh market. The estimates of crops for commercial processing include acreages grown under contract, acreages grown by processors, and equivalent acreages for tonnage procured through open-market purchases. Such equivalent acreages are not duplicated in the fresh-market estimates.

SEASONAL GROUPS

Commercial vegetable crops are harvested somewhere in the United States every month in the year. They are, for the most part, extremely perishable and must be handled quickly to avoid loss. Production prospects can change rapidly during the growing season, and estimates must be made at frequent intervals to provide a satisfactory basis for orderly marketing. Such estimates must show the aggregate supplies of all vegetables as well as quantities of each crop, because many of the vegetable crops compete with each other on the markets.

The crop season covered by the estimates of each crop for fresh market is based on the period in which the bulk of harvesting usually occurs. Separate estimates are made for the part of each crop that is marketed during each period. The calendar year is divided by 3-month periods into the winter, spring, summer, and fall seasons. These, in turn, are subdivided into periods of 1½ months ("early" and "late"), or 1 month ("early," "mid," and "late"). The number of subgroups into which the estimates for each season are broken is determined by the length of the harvesting season for the particular crop, and the number of competing areas that ship within the season.

Some overlapping between seasonal groups is unavoidable, especially among crops with relatively long harvesting periods. But since the bulk of each crop is harvested in the season indicated, the segregation is useful in showing approximate supplies of those perishable commodities which are available for consumption in each quarter of the year. In the published reports the States are arranged within each seasonal and subseasonal group in the chronological order in which peak supplies usually are harvested, with a geographic arrangement where there is no material difference in harvesting dates. Figure 17 indicates the months included in each seasonal group.

With crops for processing, such seasonal grouping is not necessary because the greater part of this acreage is grown in areas that have approximately the same growing season.
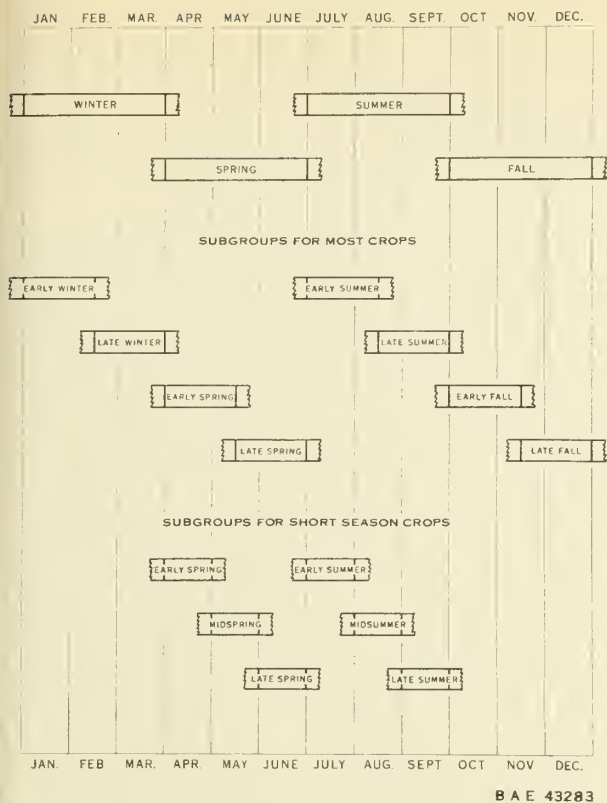
FIGURE 17.—Commercial truck crops for fresh market.

DEVELOPMENT OF VEGETABLE REPORTS

The estimating of commercial vegetable crops by the Government was started in May 1914. Then, as now, onions and cabbage were among the most highly speculative vegetable crops. The first report, issued November 5, 1914, covered the acreage and production of these two crops in the northern States that produce a surplus for storage. During these early years the program of reports handled entirely from the Washington office was necessarily limited, although by the close of 1916 it included acreage and production estimates for cabbage, onions, commercial early potatoes, cantaloupes, watermelons, celery, and strawberries, as well as for sweet corn, peas, and tomatoes for processing and cucumbers for pickles.

In 1931 seven statisticians were assigned to field investigations on a regional basis. As the program expanded, the field work, including mailed inquiries, was taken over by the State offices. This decentralization of the work on fresh-market vegetables was completed in April 1944. The program of reports now covers the following 25 vegetables and melons for fresh market: Artichokes, asparagus, green lima beans, snap beans, beets, cabbage, cantaloupes, carrots, cauliflower, celery, sweet corn, cucum-

bers, egg plant, escarole, Honey Ball melons, Honey Dew melons, kale, lettuce, onions, green peas, green peppers, shallots, spinach, tomatoes, and watermelons. Reports are also made on garlic, peppermint and spearmint for oil, commercial early white potatoes, and strawberries.

Most of the work on vegetables for commercial processing is still handled direct from the Washington office. California, Delaware, Florida, Georgia, Louisiana, Maryland, the New England States, South Carolina, and Texas, are the areas for which this work is handled by the State offices. The present program covers the following 11 vegetables for commercial processing: Asparagus, green lima beans, snap beans, beets, cabbage for sauerkraut, sweet corn, cucumbers for pickles, green peas, pimientos, spinach, and tomatoes.

COLLECTION OF INFORMATION ON FRESH-MARKET VEGETABLES

Most of the production of fresh-market vegetables is concentrated in areas that are particularly adapted to specific crops, and often plantings in these areas are controlled by groups of distributors or grower-shippers. Because of this, special methods are used to collect information on these crops, to supplement or take the place of information obtained by mailed inquiries.

In some areas reports collected by mail regarding plantings on individual farms provide a suitable basis for the estimates. This is especially true of such crops as cabbage, onions, potatoes, strawberries, and watermelons. This type of inquiry is best suited to areas where a crop is grown by many producers usually on general farms. The general methods of collecting by mailed inquiries and analyzing information on fresh-market vegetables are similar to those used with other crops. These are discussed in general in chapter 5 and in more detail in chapters 6 and 7, and only important modifications of general methods are discussed here.

Where a crop is grown as a specialty by a relatively small number of growers, personal investigation by trained field statisticians is required to obtain adequate and timely information. In some cases, large operators who are in position to report on the local situation are indifferent to mailed inquiries but many of them gladly cooperate by giving full details in personal interviews with a field statistician. Objections to answering mailed inquiries are not always based upon unwillingness to give the information; sometimes a grower feels that the Government estimates cannot be accurate un-

less they are based on personal observations by a competent statistician.

A statistician usually travels by automobile. Moving rapidly from one point to another, he observes the growing crops and makes contacts with growers, dealers, cooperative associations, bankers, and others who may have the information he is seeking. From these he gets personal reports on the number of acres planted, the general condition of the growing crop, probable yields per acre, the date when harvest will begin, the time when peak movement is expected, quality of the product, prices being paid to growers, and other pertinent facts concerning the crop. With limited time, and large areas to be covered, it seldom is possible for the statistician to interview all growers in each locality, or to make many repeat visits during the season. After he has discovered in each area the men who can and will give dependable information, and after he has become personally acquainted with them, he can usually get reports from them by telephone or telegraph when this becomes necessary between visits.

If the crop has been affected by sudden adverse conditions, as floods or frosts, a field statistician may telegraph a special report directly from the field to Washington, where it is immediately sent to all parts of the country on the Department of Agriculture's leased telegraph circuits. Ordinarily, however, he returns to his office before completing his report. There he will have the benefit of additional information obtained through special questionnaires mailed to growers and others; this is analyzed, together with the information obtained by field travel, before a recommended forecast or estimate is sent to Washington. When the field statistician's report reaches the Washington office it is carefully reviewed and verified before the official estimates are published.

Much of the information on vegetable crops grown for fresh market is collected on a locality or shipping-point basis as well as on an individual-farm basis. Locality or shipping-point data are obtained from "key" cooperators, who are usually commercial growers, officials of cooperative marketing associations, county agents, and responsible dealers or shippers. As commercial vegetable growing is often concentrated in restricted areas where the number of growers is relatively small, it has generally been found that there are enough interested and observant growers and others who are sufficiently well-informed, to furnish satisfactory judgment figures for their localities or shipping-points. An average of such locality judgment data usually gives a reliable indication, even though the reports may be relatively few.

ACREAGE

Bench-mark figures regarding acreage are established for a census year on the basis of census acreages in those counties or areas that are represented in the estimates of commercial vegetables, together with other information, as the recorded shipments and utilization.

Census figures are not always strictly comparable with the estimates of commercial-vegetable production, even when both presumably cover the same area. There are several reasons for this. One notable point of difference is that the census data do not segregate the acreages for fresh market and for processing. Then the census data include market-garden acreages, whereas the commercial-vegetable estimates relate mainly to the acreage devoted to production for shipping or commercial processing. In some counties the acreage consists almost entirely of local-market plantings; in others, it may be a combination of local-market and commercial-shipping acreage. Again, in areas in which more than one crop is commonly grown in succession on the same land during a season, the census data may not always reflect the full acreage devoted to each crop. Succession crops are likely to be puzzling to enumerate, especially when the enumeration is made a year or more after the crops are harvested. Then there is the fact that different growers may have used the same land for successive crops during the same crop season.

Any comparison with census data must take into consideration these points of difference. When the acreage reported by the census is exceeded by that obtained from other dependable surveys, or when car-lot shipments and other utilization records indicate that the census figure is too low, the bench-mark acreage estimates are largely determined by the shipment and utilization data.

Once the bench-mark acreage is established, the procedure is to ascertain the change in acreage from one year to the next. Although the acreage indications are obtained at several stages of development of a crop, the basic analysis is the same for each stage (prospective, preliminary, etc.). The main problem is the elimination of bias in the reported data. There is always the probability of a strong downward bias in reports dealing with cash crops.

Bias in mailed-inquiry reports is eliminated by means of graphic regression analysis of the relationship existing over a period of years between reported changes in acreage and the changes that actually took place. This is discussed in some detail in chapter 5 and 6. The statistician must also consider the data obtained through field travel and personal interview. This type of information usually does not lend itself readily to graphic analysis.

YIELD AND PRODUCTION

Graphic regression analysis is the statistical tool used also in interpreting reported condition in terms of yield per acre, as discussed in chapter 7. In such an analysis, allowance is often necessary for so-called trend in yields. For example, with a shifting of the areas of production, with the introduction of new varieties, better cultural practices, improved insecticides such as DDT, or more liberal application of fertilizer, a given condition may result in a higher yield than formerly. Graphic multiple regression analysis, with two independent factors, condition and trend, is often used; this method is applicable to fresh-market crops as well as crops for processing. Simple regression analysis, illustrated in chapter 7, is used also to appraise the relation between prospective yields reported at intervals during the growing season and the yields that are finally obtained. Additional data are obtained by field travel and personal interview, and are interpreted in terms of final yields on the basis of past relationships between similar reports and the final outturn.

Early-season forecasts of production are derived from the forecasts of acreage and yield, previously mentioned. These early-season forecasts are indications of prospective production on the basis of current conditions and under the assumption that average growing conditions will prevail during the remainder of the season. Such estimates do not take into account unusual conditions which may develop later, nor do they attempt to forecast the future, except in the light of what has happened *on the average* during past years. But they are useful in keeping growers and the general public informed on the crop's progress and prospects.

Final estimates of production differ from the early estimates in that they are based upon the acreage harvested and harvested yield per acre, as reported at the end of the season by growers and shippers. Final estimates of fresh-market vegetable crops are usually closely in line with the production actually harvested but if unusually large quantities of a crop are left unharvested because of low prices, labor scarcity, or other *economic factors,* these quantities are included in the estimates of total production, but are excluded in computing the value.

Important check information on production is provided by the records of car-lot shipments, which are reported by all railroads and steamship lines to the Department of Agriculture. Truck unloads also are reported for 15 cities. For a few States figures are available also on inspected truck shipments and sales through auctions or other markets. At the end of the

marketing season these figures on recorded movement are converted into equivalent production units and are used as a check against total estimated production. Lack of complete information on truck movement, however, lessens the possibility of checking production estimates in this way, particularly for the areas near consuming centers. Figure 18 illustrates the use of such check data.
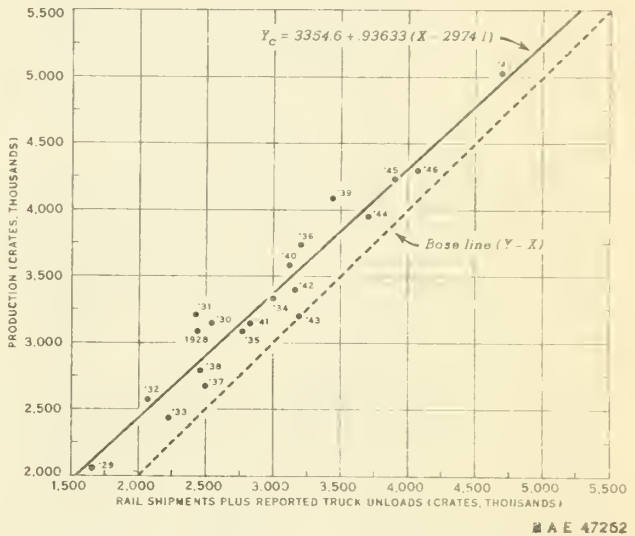
FIGURE 18.—Lettuce, California Early Spring: Regression of production on rail and boat shipments plus reported truck unloads.

VEGETABLES FOR COMMERCIAL PROCESSING

Although the making of estimates for vegetable crops for processing follows the same general procedure outlined for vegetables for fresh market, certain features about the industry deserve special mention.

Processing crops differ from the fresh-market crops in that about 90 percent of the acreage is either contracted to or otherwise under the control of the processors. The vegetable-packing industry is carried on by approximately 2,000 firms. Most of these firms contract with nearby farmers to grow a definite number of acres or to deliver a definite number of tons, each season; others grow a large part of their requirements on their own or leased land. Open-market purchases, although of growing importance for some crops, are negligible on others, as green peas and sweet corn. Each firm keeps accurate records of acreage under its control, total tonnage of each crop handled during the season, total number of cases packed, and average prices paid to growers. Moreover, processors keep in close touch with the progress of the crops throughout the growing season. Thus

they are in a better position than anyone else to furnish reliable information on these crops.

Practically all information on crops for processing, therefore, is obtained directly from the processors. Inquiries are based upon the operations of the individual firm rather than upon the locality. As the "universe" to be sampled is limited to about 2,000 processors, comparison of reports for identical processors becomes comparatively easy. On the other hand, if a large firm omits a report it may cause serious errors in estimates for those States in which it is the dominating factor. Most of the large firms are among the most consistent and willing cooperators. On some inquiries, more than 80 percent of the total acreage is represented by the sample reports.

All information is furnished voluntarily. Such information is held strictly confidential and is used only for arriving at State totals. States which have only one or two processing firms are thrown together in a single group labeled "Other States" to avoid disclosing the operations of individual firms.

The present program of estimates consists of the following: Estimated prospective or intended acreage, preliminary estimate of planted acreage, forecasts or early-season estimates, and final estimates at the end of the season of planted acreage; harvested acreage, yield per acre, production, average price paid to growers, and value.

The preliminary estimate of acreage planted to green peas is supplemented by estimates of acreage planted to each of two types, as are also estimates of the snap-bean acreage. The preliminary estimates of the acreage of sweet corn are broken down by four types. The prospective and preliminary estimates of acreage, as well as the final estimates of total acreage and production of green peas, are supplemented by national estimates of that part of the total crop used for freezing and that part used for canning and other manufacture. From May to July inclusive, special reports are also issued on growing conditions and progress of crop as of the first and fifteenth day of each month. Early-season estimates or forecasts of production at monthly intervals are made for most crops for processing except green peas, which are covered semimonthly. Forecasts of production are not made for pickling cucumbers during the growing season, but a preliminary estimate of production is made at the end of the season together with a report showing the quantity of salt and dill stock in tanks and barrels on October 1.

Reports on prospective (intended) acreage are issued immediately before general planting begins. Their purpose is to provide growers and the industry with an indication of the acreage that may be planted, so that changes in plans may be made before plantings are actually made. These reports are not estimates of the acreage that will finally be planted. They are, rather, indications of the acreage that would be planted should reported intentions be carried out to about the same extent as in the past. The acreage actually planted is ascertained after the planting has been completed.

In all requests for data on prospective and planted acreages, packers are asked to give the acreage for both the current season and the past season. All comparisons are kept on a planted basis. This has been found more satisfactory than asking packers to report planted acreage for the current season compared with harvested acreage the last season. As most of the acreage is on a contract basis, packers are more likely to keep in mind the planted acreage of the previous season than they are the harvested acreage.

It has been found desirable to ask for the past year's data on all inquiries regarding acreages of processing crops for several reasons. For those firms that operate several factories, the data can be kept on a comparable basis; a firm's report for the current season might refer to only one of its plants, whereas in the preceding season the firm may have included all of its plants in the report. Or a packer may buy another plant and include data on it for the current season. In either case, the current reports in the respective seasons would not be comparable. Moreover, the acreages of some firms that failed to report during the past season may be obtained this year.

Forecasts of production are handled by much the same methods as used with truck crops for fresh market. On the basis of past relationships between acreage planted and acres harvested, an interpretation of the acres for harvest in the current year is made at the time the first forecast of production is made. Condition reports are interpreted by the use of simple graphic regression analysis, as illustrated in chapter 7. Packers are requested to give their judgment on probable yield per acre as of those dates for which production forecasts are made; their replies give a good check on the prospective yield of crops for processing. The indicated yield is applied to the estimated acreage for harvest to ascertain the production in prospect on a specified date.

After the crops have been harvested, the processors are asked to report for the current season the acreage planted, acreage harvested, tonnage or quantities procured from contract acreage, and tonnage bought on the open market, all data to be broken down where necessary into use for freezing and for canning and for other processing. Information is obtained on

the number of cases (in terms of a standard unit) packed per ton of raw product. The planted acreage obtained on this processor's report discloses any changes that may have taken place after the preliminary estimate of planted acreage was made. The reported number of cases packed per ton is used in checking the estimates of production used for canning against the annual enumerations of the canned pack made by the National Canners' Association. Reported quantities used for freezing are checked against the data on frozen pack compiled annually by the National Association of Frozen Food Packers.

As the published estimates are used by packers as well as by growers, and as packers are interested primarily in the probable size of the season's pack, one objective is to furnish early-season estimates of production which will serve as reliable indications of the probable number of cases that will be packed. The industry and trade need information of this nature during the growing season since a report on the pack, made by the National Canners' Association, is not available until the close of each season.

Forecasts of production for the four major processing crops (tomatoes, sweet corn, green peas, and snap beans) generally give a good indication of the final figures regarding pack. For example, in the case of sweet corn for processing there is a high correlation between the first forecast of production on August 1 and the number of cases that are finally packed (figure 19). The forecasting, on a national basis, of the size of the pack, in terms of cases, is now under consideration.

$$Y_c = 20.47 + .0213\,(X - 859.47)$$

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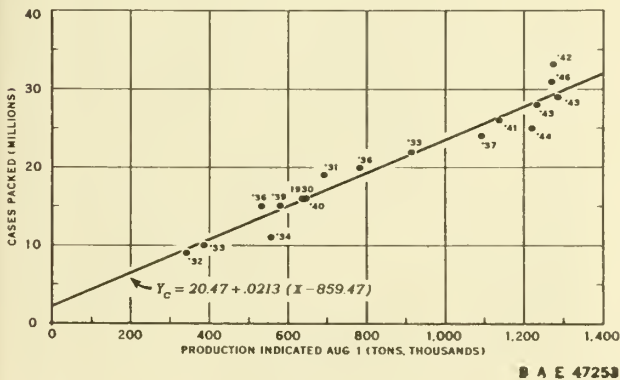
FIGURE 19.—Sweet corn for commercial processing, United States: Regression of cases packed (standard 24-2s) on August 1 indicated production.

POTATOES

Potatoes are grown in every State and are harvested in some part of the country in each month of the year. The States are classified as early, intermediate, and late, depending on the time the bulk of the crop is harvested.

The procedures used in estimating other field crops are followed in estimating the total crop of white potatoes. The first estimate of the national potato crop is made as of July 1. However, by July the commercial early crop in many parts of the South, and much of the California early crop, has been marketed. To furnish information on the production of the early crop grown in these areas for shipment to distant markets a series of commercial early-potato estimates was inaugurated in 1918, along with the estimates of other vegetables grown for fresh market.

The estimate of the commercial early crop is a supplement to the estimate of the total potato crop which includes all potatoes produced in a State regardless of the time of harvest and the utilization.

Estimates of the commercial early crop are grouped seasonally, as outlined for other fresh-market vegetables. Only Texas, Florida, and Georgia require estimates for more than one seasonal group. For example, in Texas, where concentrated areas of production are scattered from the Lower Rio Grande Valley to the Panhandle, separate estimates are prepared for the winter, early spring, late spring, and summer crops. The procedures used in estimating commercial early potatoes are the same as those used for other commercial vegetables.

In some commercial early-potato areas, Baldwin County in Alabama, and Florida for instance, the records of in-shipments of seed provide a good measure of the year-to-year change in acreage. The change in acreage indicated by the crop meter has been reliable in certain areas of heavy concentration, as the Eastern Shore of Virginia and Aroostook County, Maine.

Rail shipments plus inspected truck movement and recorded unloads at certain terminal markets are used in checking the estimates of production in States where sales constitute a large percentage of production. In Maine and Idaho, an enumeration of quantities of potatoes processed is also available for checking production estimates.

SWEETPOTATOES

Production estimates for sweetpotatoes have been available since 1868. Estimates are now prepared for 22 States. The procedures used in estimating the acreage and yield of field crops are followed when preparing estimates of this crop. As the crop is produced under the ground the forecasting of yields is difficult, as in the case of white potatoes. Luxuriant vine growth is not necessarily an indication of heavy

root growth; hence yields indicated by end-of-season surveys may vary considerably from those indicated by earlier reports.

In areas of concentrated production, as the Eastern Shore of Maryland and Virginia, southern New Jersey, California, and Louisiana, recorded rail and boat shipments plus truck unloads at the terminal markets provide a reasonably satisfactory basis for checking the estimates of production but outside of these areas such check data cover a relatively small part of the crop.

CHAPTER 10. FRUITS AND NUTS

By Reginald Royston, Cary D. Palmer, Elbert O. Schlotzhauer, and Paul F. Kiesler

DEVELOPMENT OF FRUIT AND NUT REPORTS

Quantitative estimates and forecasts of fruit production were inaugurated shortly before World War I. Percentage-condition reports during the growing season and percentage-production at the end of harvest for the four principal fruits—apples, peaches, pears, and grapes—were first obtained from crop reporters in all States during the months of June through November 1866, but it was not until 1914 that these condition and percentage-production reports were interpreted into quantitative-production estimates. By 1914, the possibilities opened up by refrigerator-express movement had resulted in keen competition between the various fruit areas, and because of this growers and trade organizations demanded more information as to future supplies. The European war created a further urgent demand for more specific information concerning food supplies.

The first forecast of apple production was made in August 1914. Peaches and pears were added to the program in 1915. By 1916, a fruit specialist was employed whose full time was devoted to working up historic data and establishing a basis for the forecasts. The first forecast for grapes was made in 1925. By December 1925, an estimate of production had been initiated for 12 additional fruit and nut crops.

During the late twenties monthly forecasts of production were begun for apricots, plums, prunes, almonds, and walnuts. During the early thirties, cherries, pecans, and filberts were added. It was not until 1934 that a complete program of monthly forecasts was established for oranges, tangerines, grapefruit, lemons, and limes. Currently, the Crop Reporting Board publishes monthly production forecasts during the growing season for 14 fruits and 4 tree nuts, apples (commercial areas only), peaches, pears, grapes, cherries, apricots, plums, prunes, oranges, tangerines, grapefruit, lemons, limes, cranberries, almonds, walnuts, pecans, and filberts. Annual estimates (mostly in December) are made for 7 additional fruits—figs, olives, avocados, dates, pineapples, persimmons, and pomegranates—and for tung nuts.

In addition, the program has been expanded to include variety forecasts as follows: 1929, California clingstone and freestone peaches, California wine grapes, table and raisin grapes; 1934, California Navel and miscellaneous oranges and Valencia oranges, Florida early and midseason oranges and Valencia oranges, Florida tangerines, and Florida seedless and other grapefruit; 1937, improved pecans and wild or seedling pecans (12 States); 1939, sweet and sour cherries (12 commercial States) and Bartlett and fall or winter pears in the three Pacific Coast States; 1944, apple production by varieties, for the principal producing States and areas.

Since 1938, estimates of the apple crop have been restricted by law to commercial production. Estimates are available covering total production of apples for the years 1909-1938 and commercial production from 1934 to date. Estimates of the commercial crop refer to total production of apples in the commercial apple areas of each State.

The need by growers, trade organizations, and Government agencies for data showing the utilization of the various fruit crops became urgent with the advent of World War II. In an effort to satisfy these demands for information concerning food supplies, a program was developed for annual estimates of utilization of fruits by fresh sales and by the principal processing uses. The first annual report of this kind was published for noncitrus fruits in 1944 and for citrus fruits in 1945.

Estimates of fruit and nut acreages in California have been published annually for the years 1919 to date, as a result of facilities provided by the California State Department of Agriculture. In 1949, series of estimates as to acreages of fruits and tree nuts in other States were published for the years 1919-46.

ESTIMATING METHODS

Estimates of fruit production made by the Crop Reporting Board are developed by methods that differ somewhat from the procedures followed in estimating such field crops as wheat and cotton. For tree fruits and nuts, the bearing surface corresponds in a general way to the acreage planted to a field crop. However, the bearing surface of fruit trees is increased by young trees coming into bearing and by the growth of trees already in bearing. It is reduced either by natural causes or by removal of trees. Unlike acreage of annual crops, the bearing surface of fruit trees is not likely to vary greatly from year to year. Although sev-

eral methods of estimating production of fruits, such as "percent full crop times par," and "production check data" are used in making estimates of fruit production, the "percent full crop times par" method is more extensively used.

Par condition method

This description of the par method of estimating fruit crops refers specifically to apples, but the same general procedure is applicable to other fruit crops.

Historically, the 5-year Federal census of agriculture has furnished an enumeration of numbers of apple trees of bearing age, numbers of apple trees not of bearing age, and production of apples in the year preceding the date of enumeration. This information, together with indications from General Crop Reporters of production as a percentage of a full crop during the census year, is used to establish an indication of the full bearing capacity or "par" of the apple orchards of each State for the census year. Furthermore, it serves as a basis for projecting estimates of the bearing capacity of apple orchards for intercensal years.

Forecasts of production are the product of estimates of bearing capacity (par production) and percentage of full crop. During the current growing season, farmers are asked each month on a mailed questionnaire for their estimates of the condition of the apple crop in their localities in terms of percentage of a full crop. The questionnaire or schedule instructs the reporter to let 100 percent represent a normal condition of growth and vitality which would be expected to give a full yield when weather conditions are favorable and insects and disease cause a minimum of loss. In other words, if the respondent thinks the area has half of a full crop he reports 50 percent, and if he thinks the area has three-quarters of a full crop he reports 75 percent, and so on. At the end of the season (November 1) a question worded, "production, percent of a full crop" is asked. The replies of growers as to condition and production as percentage of a full crop are summarized by counties and groups of counties and weighted to obtain an average for each State.

In the census enumeration years, the weighted average percentage of production reported by growers is divided into the census production to obtain a theoretical 100 percent full crop or "par" for the census year (census production ÷ percentage of full crop × 100). Projection of this par for use until the next census enumeration is based to a large extent upon the trend in numbers of bearing trees, nonbearing trees, and production in the last several years. This projection of a basic par, or 100-

percent equivalent crop, is feasible because changes in numbers of bearing trees and bearing surface are usually gradual and fairly uniform from year to year.

An example may serve to clarify the par method. The percentage production reported by growers in November for Washington apples and the production for Washington for three census years (1934, 1939, and 1944) and the noncensus year 1945 are shown in table 2. Taking the census years for the base, if in 1934 the average of a large number of reports showed that growers considered the production to be 76 percent of a normal crop, the equivalent 100-percent crop would have been 41,876,000 bushels (31,826,000 bushels ÷ .76). Similarly, the 100-percent crop can be determined for the other census years. These 100-percent equivalents for the census years are termed "basic pars." This method assumes a straight-line relationship in which a reduction in reported percentage of a full crop represents a proportionate decrease in production. To the extent that the samples for successive years are comparable (that is, regardless of how biased the report may be, so long as the bias is consistent) this method of computation automatically eliminates such bias. For example, if the respondents consistently report too low in November, the 100-percent equivalents will be correspondingly higher. If in 1934 the reported percentage had been 75 percent, the basic par would have become 42,435,000 bushels instead of 41,876,000 bushels.

TABLE 2.—*Determination of the par or 100-percent equivalent of fruit-crop production —Washington commercial apples*

Year	Reported production	Production	100-percent equivalent or full crop
	Percent	*Bushels*	*Bushels*
1934	76	31,826,000	41,876,000
1939	70	24,768,000	35,383,000
1944	91	31,600,000	34,725,000
1945	76	26,530,000	34,908,000

Having established basic pars for the census years 1934, 1939, and 1944, and having calculated pars for the intervening years, suppose we wish to estimate the Washington apple crop in 1946, a year in which there was no census. By inspection, or when plotted, a downward trend in the pars between 1939 and 1941 is apparent. The trend then turned upward and since 1941 it has continued upward (fig. 20).

This trend of the 100-percent equivalents or pars is perhaps one of the best ways of handling trend in the series. To the extent that the reported percentage production reflects the character of the season, this method eliminates statistically variations caused by weather and similar production factors, and the series represents more nearly the time trend in production possibilities. Projecting the trend of this series gives one indication of the par for the next year.
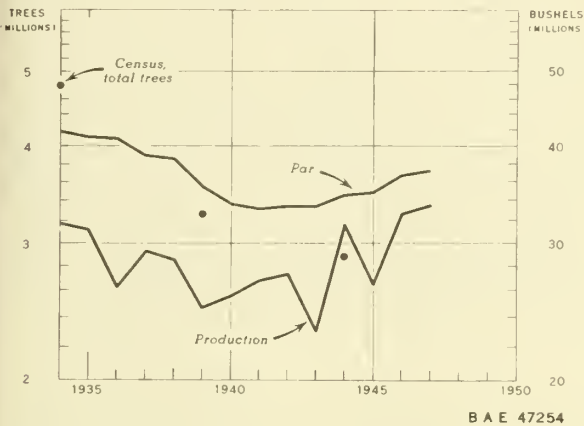
FIGURE 20.—Commercial apples, Washington; census number of trees, estimated production, and pars, 1934-1947.

In establishing the par for the next year, however, it is necessary to take into account the changing acreage and other factors affecting the total bearing surface of orchards in the State. An indication of the change is afforded by the census enumeration of the trees of bearing and nonbearing age. The past trend in numbers of bearing trees, as shown by census enumerations, together with the number of nonbearing trees in orchards, indicate the potential increase or decrease in bearing surface.

In establishing the par for 1946, it was estimated from a study of census tree numbers and yield per tree that the bearing surface was increasing at a rate of 2 percent a year. Accordingly, the par for 1946 was established at the beginning of the crop season by increasing the 1945 par by that amount. The par production was thus 35,600,000 bushels. As the percentage production reported in November 1946 was 89 percent, production indicated at that time was 31,684,000 bushels. This was the 1946 preliminary production estimate. The final check-up on production gave an estimate of 32,710,000 bushels, reflecting a par of 36,753,000 bushels.

Figure 20, on semi-logarithmic paper, shows the par line for Washington commercial apples for the period 1934-47. For comparison, production for the same period and the census figures on total apple trees in commercial areas are shown for the years 1934, 1939, and 1944.

Occasionally, there is more evidence as to trend than the 100-percent equivalents derived from the final check-up of production and the census number of trees. For recent years some supplementary information has become available from special surveys on numbers of trees by age groups which give current indications of changes in bearing surface and in production. This information is compiled and used in calculating par production of the various States at the beginning of the season.

Records show that reported condition for any month before harvest usually differs from the final percentage production reported. This is primarily due to the effect of unanticipated weather conditions and other factors between the time of reporting and harvest. A consistent bias is usually greater early in the season and it decreases as the season advances. A grower can tell more accurately what his prospects are as time of harvest draws closer.

The bias varies among crops and among States. Early-season bias is adjusted by correlating condition with the final percentage of a full crop. This is usually done by using a graphic regression chart.

For commercial apples in Washington, the reported November 1 percentage of full crop is plotted against the reported August 1 condition. Included in this series are 14 years; in two of these years the November 1 percentage of a full crop was the same as the August 1 condition, in seven of the years the November percentage of full crop was higher and in five it was lower than the August 1 condition.

Production checks

An accurate check on production for the previous season is very helpful in establishing a dependable par production at the beginning of a current season. Census checks are available every fifth year for nearly all fruits. For intercensal years, railroad and truck records of shipments of fresh fruits and reports from processors of receipts of fruit for canning, drying, and other uses have enabled the Crop Reporting Board to make an accurate check as to utilization and production of the more important fruits in a number of States. These independent indications of production each year have permitted a year-to-year adjustment in the basic pars. More accurate estimates have thus resulted.

Such production checks are feasible only when a large proportion of a State's crop moves through marketing channels from which a rec-

ord of movement is obtainable. In some States only a small fraction of the crop is processed and the proportion accounted for by the recorded truck and rail movement is not large enough to give a reliable check on production. In these cases, which exist mostly when a State's production of a fruit crop is relatively unimportant, the only reliable indication of absolute production is the quinquennial Census.

Regression method

In recent years a graphic correlation procedure has been developed for estimating production from two independent variables. In the case of most fruit crops, condition is the first independent variable and time the second. However, a frame count (which is discussed later in the chapter) or some other indication is sometimes used as the first independent variable.

In this method, for example, average reported condition is plotted directly against production for all the years for which data are available. A least-squares (regression) line is then calculated and drawn on the chart. If there is no correlation between time and condition, the least-squares line is the net regression line. Correlation between condition and time is usually not significant, but in case of significant correlation a three-chart method described later in the discussion is more satisfactory. Residuals from the regression line are plotted on a time chart to obtain an indication of the extent of trend included in the departures from the regression line. Residuals are plotted on the time chart in terms of ratios or percentages rather than in the actual units of production. Ratios are actual production estimates divided by the production read from the regression line. This procedure is followed because the relationship between time and production is one of multiplication rather than addition, as would be the case if residuals were used in terms of production. Trend should account for most of the differences between regression-line estimates and actual production. By trend is meant the changes in production capacity caused by changes in numbers of trees and changes in the bearing surface of the trees.

In practice, this method is used by projecting the trend line on the basis of available data on changes in bearing surface since the previous season. Production is read from the regression of production on reported condition. This reading is multiplied by the percentage indicated by the trend line and the result is the indicated production.

Florida Valencia oranges are used as an example to illustrate the regression method. Table 3 shows the December condition, final production, regression-line production, and the ratios of the final divided by the regression production values. In practice, the regression line is drawn freehand. It is not computed. Figure 21 shows the ratios of final production divided by the computed or theoretical production plotted against time. In the case of Florida Valencia oranges, if time is used as the first independent variable (X_1) and condition as the second independent variable (X_2), the estimating equation from data for the period 1939-40 to 1947-48, is $Y = 2.490 + 2.153\ X_1 + .080\ X_2$.
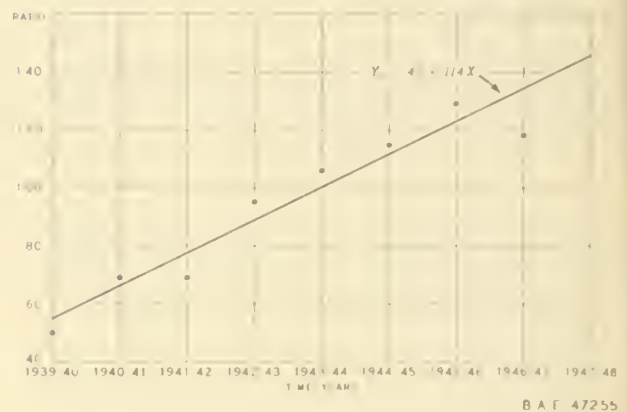
FIGURE 21.—Valencia oranges, Florida: Regression of ratio of production estimates to regression of such estimates on percent condition reported December 1 on time.

TABLE 3.—*Valencia oranges, condition and yield, Florida*

Year	X Dec. 1 condition	Y Production	Yc Production computed from regression on condition	R Ratio Y/Yc
	Percent	*1,000 bu.*	*1,000 bu.*	
1939-40	76	10,000	20,007	0.50
1940-41	64	12,400	17,932	.69
1941-42	61	12,000	17,414	.69
1942-43	70	18,100	18,970	.95
1943-44	72	20,400	19,315	1.06
1944-45	66	21,100	18,278	1.15
1945-46	70	24,400	18,970	1.29
1946-47	74	23,200	19,661	1.18
1947-48	67	27,400	18,451	1.49

If there is correlation between reported condition and time, the following method of estimating production from the reported condition can be used:

(1) A correlation chart (fig. 22) is prepared with time on the X axis and production on the Y axis, and the least-squares line is calculated and drawn in.

FIGURE 23.—Oranges, Texas: Regression of percentage condition reported December 1 on time, 1930-1947.

(3) A third correlation chart (fig. 24) is prepared with residuals from the least-squares line on figure 23 plotted on the X axis, and residuals from the regression line on figure 22 plotted on the Y axis. A least-squares line is then drawn (fig. 24). To obtain an estimate from a reported condition, the condition is read from the least-squares line on figure 23 for the year being estimated. Production is read from the least-squares line on figure 22. The difference between the reported condition and the condition recorded in figure 23 is read on figure 24 to obtain an adjustment quantity of production to add or subtract, as the case may be, to or from the production figure read from figure 22. This gives an estimate of production.

An estimate of Texas oranges from the December 1 condition is given as an example of

FIGURE 22.—Oranges, Texas: Regression of production on time, 1930-1947.

(2) A second correlation chart (fig. 23) is prepared with time on the X axis and condition on the Y axis, and the least-squares line drawn in.

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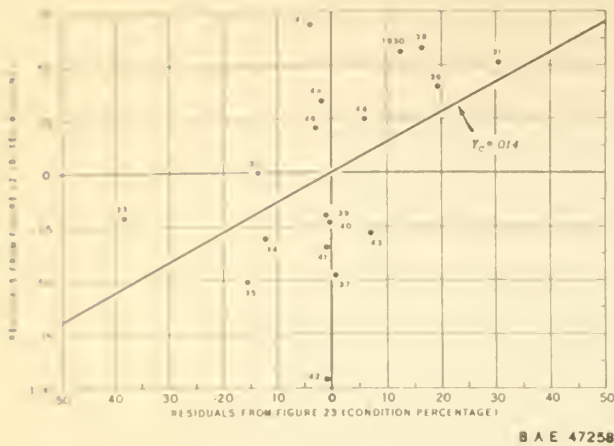
FIGURE 24.—Oranges, Texas: Regression of residuals from figure 23 on residuals from figure 22, 1930-1947.

this method. To obtain an estimate of production on December 1, 1948, suppose the reported condition is 75 percent. On figure 22 production is read at 5,430,000 boxes. On figure 23 condition is read at 86 percent. Reported condition, however, was only 75 percent so an adjustment must be made in the production indicated on figure 22. The difference of —11 percent is read on figure 24 which indicates —165,000 boxes. Production, therefore, is indicated at 5,265,000 boxes.

Frame counts

For oranges in California and Arizona and for oranges, grapefruit, and tangerines in Florida, counts and size measurements are made by growers' administrative committees. Growers' administrative committees of these States are semiofficial bodies. The California and Arizona committees regulate the volume, grade, and size of fruit shipments from their States, and the Florida committee regulates the grade and size of fruit shipments from Florida. These counts and size measurements are used as one of the methods for estimating the crop of the various districts and the State total.

Groves and trees within groves are selected by a predetermined sampling scheme. For each selected tree the number of fruits within the limits of parallel lines of a given frame from the outside of the tree to the trunk are counted. The frame is like a picture frame; it is placed against the branches of the tree about 5 feet from the ground. The size of each fruit in a sample is measured with calipers. Records of number of fruits per frame and average diameter per fruit are made. Year-to-year changes in number of fruits per frame and volume of fruit per frame are used as indications of change in crop size. Regression of production

on these variables with time as a second variable is a more satisfactory approach in using these indications; the number and size of fruit per frame alone do not account for changes in acreage and they reflect only slightly the changes in bearing surface of the trees sampled.

Sample surveys of individual orchards are used to a limited extent in estimating production of fruit crops. Schedules are sent to growers at the beginning of and during the harvesting season. The schedule asks for a grower's production last year and his expected production this year. An indication of production this year as a percentage of last year is thus obtained. The sample indication may be biased because of the conservatism of the grower in estimating this year's crop and because of sampling selectivity. This bias is eliminated by correlating the reported ratios with the ratios computed from production for past years. The ratio as read from the correlation chart is applied to last year's production to obtain an estimate of production for the current season.

Bearing acres and yield per acre

Estimates of production of tree fruits and nuts have not yet been made by estimating bearing acres and yield per acre separately; however, the possibility is being explored and the reliability of this method is being tested. Except for California, estimates of bearing acreages of fruits have not been available until recently. This method is analogous to that used in estimating field crops. Bearing acres would be estimated at the beginning of the season and carried through the season. Forecasts or estimates of yield per bearing acre would be made each month, based on average reported condition, average reported yields, or other indications. Production would be the product of acres and yield.

In addition to estimates of production of fruits and nuts prepared by Agricultural Estimates, many production estimates for areas ranging from parts of counties to States are made by industry groups. Many cooperative marketing associations, traffic associations, and independent handlers and shippers make estimates of production for the area from which they draw supplies. The area dealt with may be a county or group of counties. It is more often a natural shipping area that cuts across county or even State lines. These estimates in some cases represent informed judgment opinions of one or more individuals. In others they are based on rather extensive sampling and enumeration procedures. Some have a short and irregular history; that is, an estimate may be available for only one or perhaps only a few years, with some years missing from the series.

Sometimes they are made about the same time each year and sometimes the date varies from year to year. Generally, the purpose of these estimates is to determine the approximate volume that the organization concerned may expect to handle so that it can do a better job of marketing and transporting the crop to the consuming public.

"Cruising" is employed by some. This consists of a more or less systematic visiting of orchards by field men who estimate the prospective size of the crop for the orchard. This is done either by making an over-all estimate for the orchard after walking through it and studying the production record for previous years, or by estimating production of a selected number of trees and expanding this to a total for the orchard. Probably the more extensive use of estimating procedures is by the California Orange Administrative Committee which prepares estimates of the State's crop size by prorate districts. Methods include both frame counts and "cruising" by field men.

In preparing Government estimates of fruit crops, all available industry estimates and indications are used. Whenever an industry series of estimates for a State is available, the regression approach is used in relating these estimates to the final outturn. When industry estimates are available for only a portion of a State, their use is more difficult. Generally, the procedure is for a State statistician to obtain industry estimates for as many portions of the State total as possible. He then makes his own estimates for these portions for which industry data are not available, and adds the two to arrive at a State total. In this way, a rough check is obtained on the State estimates derived from data gathered by the State statistician from crop correspondents, and from field travel. These industry estimates are also used to check against indications from crop correspondents for local areas.

Following harvest, records of movement to fresh markets and utilization of the crop by processors are obtained; they are used to check the production estimate and to revise it if necessary. These records are also used to make estimates of farm disposition and utilization of the crop. Utilization estimates are published annually. The record of movement consists of carlot shipments by rail and boat (which are complete), motortruck shipments (which are fragmentary), truck unloads in about a dozen large cities by State of origin (which vary in completeness but do furnish a helpful indication for many States), and records compiled by traffic associations and industry marketing agencies. In many States, reports from processors of receipts of the various kinds of fruit are obtained by mailed schedules, telephone calls, and personal visits. In other States, particularly California, dependence is placed on the records obtained from processors by trade associations such as the Dried Fruit Association, the Wine Institute, and the California Canners League. In all States, available records of the fruit pack in cases of canned fruit, pounds of dried fruit, and pounds of frozen fruit are converted to a fresh-fruit basis. These are used with other data as a check on the crop size and in preparing estimates of utilization.

Enumerations of the Census of Agriculture furnish a basis for revision of the yearly estimates. These are especially important in States in which data as to crop movement and disposition are nonexistent or inadequate. Also, the census, through its enumeration of number of trees of bearing age and trees not of bearing age, gives a basis for forecasting bearing acreage and bearing surface. Forecasts of bearing surface may be translated into a par for each year, permitting use of the percentage full crop approach to estimating in years following the Federal Census enumeration. In California, annual estimates of acreage of trees, by kinds of fruit, varieties, and age groups, are prepared by the State Statistician. These estimates are based on data obtained in cooperation with the County Agricultural Commissioners, who furnish records of trees planted and trees removed and who make surveys of various areas within their respective counties from time to time, either independently or in cooperation with representatives of the State Statistician's office.

APPRAISAL OF ESTIMATING METHODS

The foregoing discussion has described the various methods used to estimate fruit and nut crops as well as alternative methods that might be used. Some consideration should be given to an appraisal of these estimating methods. The accuracy of the estimates, the time taken to prepare them, and the over-all cost of preparation by the various methods are pertinent criteria. For deciduous fruits, the par condition method has been generally used for many years with relatively little assistance from other approaches. For United States production, the coefficients of variation between the first forecast of production and the final estimate of production for the years 1935 to 1946 were as follows: Apples, 5 percent (1939 to 1946 only); peaches, 9 percent; pears, 11 percent; grapes, 9 percent; and cherries, 16 percent. In making these forecasts it was assumed that growing conditions would be average from the time of forecasting until harvest. Actually, however, the weather in any one season is rarely average.

The par condition method

The par condition method is simple and easy to handle from the standpoint of mechanical operation. These are important characteristics, as time is at a premium when preparing the monthly forecasts. The efficiency of the par condition method of forecasting fruits depends to a large extent on the ability of statisticians to project correctly the basic par from season to season. When annual production check data are adequate to give a reasonably accurate estimate of the previous year's crop, it is possible to project the basic par for the next season with relatively little error, as these errors do not become cumulative but are corrected each year. When check data are not adequate to revise the season's estimate before the forecast of the next season, rather large cumulative errors can occur during the 5-year intercensal period, especially when large changes in bearing surface occur because of losses of trees, large numbers of young trees coming into bearing, or for other reasons. The par-condition method assumes a proportional change in production for each percentage change in reported percentage of a full crop throughout the full range of reports; that is, for a given bearing surface a reported 80 percent of a full crop should mean twice as large a production as a reported 40 percent of a full crop. Study of basic records indicates that crop respondents tend to understate large crops. This seems to be due to the reluctance of respondents to report a condition as great as 100 percent. Reports by individual respondents exceeding 100 percent are rare.

The par condition method lacks the directness in approach of the acreage and yield-per-acre method used for field crops. In the case of reported yields per acre of field crops, reported yields are adjusted to census levels or to levels indicated by production check data at the end of the season. However, it is difficult to adjust satisfactorily the reported data on percentage of the full crop at the end of the season for understatement or overstatement. In practice the final reported percentage of the full crop is generally carried unchanged and the par is allowed to vary from a smooth trend line.

Regression method

The regression method uses the same basic data as the par approach. In both methods it is necessary to project the trend in bearing capacity before making the forecast. In the regression method, once the trend is estimated, the production estimate is merely a mechanical computation. Par and regression methods each require about the same amount of time and judgment in making production estimates and the results do not differ significantly. In estimating fruits the par method has been used for many years for all crops, whereas the regression method has been used only to a limited extent.

Sample surveys of individual orchards

This method has proved successful as an auxiliary method of estimating Florida citrus crops, but it has not yet been of much value for other fruit crops. It is more efficient in States in which production is highly commercial. It requires a large list of representative grower-reporters. One of the greatest problems in connection with this approach is inter-orchard variability, as for some fruits in some States the range in individual orchard production is from a few bushels to many thousands of bushels. It is difficult to obtain regular cooperation from reporters, as many fail to report after having reported once. However, this method has the advantage of allowing the respondents to make their reports in the terms in which most of them think of their fruit crops, that is, expected total bushels (or whatever unit of production is applicable) for the entire crop for the season. Several years of data are needed in order to make adjustments for bias. Growers tend to understate the crop size at the beginning of the season. Mechanical difficulties of handling these surveys each month when time is at a premium are rather serious. The method is not suitable for use in States in which a large part of the crop is noncommercial and widely scattered.

Frame counts

This objective method of estimating fruit crops is suitable for intensive commercial areas. Initial field work is expensive and time-consuming, and the results may be invalidated overnight by a hurricane or freeze. As this method merely gives a count and measurement of fruits within a specified section from the outside to the trunk of the tree it makes allowance for changes in bearing capacity in only one dimension and hence is subject to the same deficiencies in this respect as the par condition approach. Increased height and circumference of the tree are not allowed for adequately by this indication of crop size. As now used, it makes no allowance for change in bearing acreage.

Bearing acres and yield per acre

This method has the advantage of being easy to explain. It is easily understood by those not familiar with the details of preparing fruit

estimates. "Acreage times yield equals production." It has a further advantage in that it is similar to the method used for estimating production of nearly all crops other than tree crops. It poses the same problem as the par method, as yield varies with the age of tree as well as with condition of trees and the fruit. Therefore, when deriving yields from condition data, allowance must be made for trends in yield per acre, as allowance must be made for trends in the total bearing surface when using the par method.

By Arnold V. Nordquist and Glenn D. Simpson

SCOPE

The livestock estimating program of the Department has been expanded considerably in the last 25 years. Compared with the crop estimating program it might still be called relatively new. Several important series of livestock estimates, such as semiannual estimates of pig crops, and annual estimates of farm production of livestock and income from livestock, by States, were begun in 1924. Estimates of total commercial slaughter by States were begun in 1946. The increase in statistical coverage can best be shown by comparing types of reports issued 25 years ago with those issued in 1948.

Before 1923 the livestock estimates were limited to the following, by States: Annual estimates as of January 1 of the number of head, value per head, and total value of the different species; estimates in the spring of the number of brood sows and of livestock losses from various causes during the preceding 12 months; an estimate in the summer of weight of fleece and total production of shorn wool; and an estimate in the fall of the number of stock hogs. In addition, for several years before 1923 the indicated monthly changes in numbers of cattle and hogs on farms of crop reporters were published.

The present program for statistics and reports relating to livestock consists of issuing the following types of estimates:

1. Estimates of livestock on farms and ranches, January 1, by classes, value per head, and total value, by States, are published every February.
2. Estimates of cattle, sheep, and lambs on feed for market on January 1 are issued every January. Reports on estimated changes from the previous year in numbers of cattle on feed are issued in April and August each year. Narrative reports on developments in feeding situation are issued in October, November, and December.
3. National estimates of numbers of hogs over 6 months old on farms June 1 are issued annually in June.
4. Estimates of livestock births which include: (a) Semi-annual reports on the number of sows farrowing and pigs saved in the spring and fall seasons and sow-breeding intentions, issued in June and December; (b) a report on the early lamb crop, issued in March, and one for the total lamb crop, issued in July; and narrative reports covering the development of the early lamb crop released in April and May.
5. Estimates of farm production and disposition of meat animals and cash receipts and gross income from meat animals (cattle, hogs, and sheep), by States, are published every April.
6. Estimates of wool and mohair production and income, by States, are published annually in March. A preliminary report on wool production, by States, is issued in August.
7. A National estimate of the production of pulled wool is issued annually in March.
8. Western range and livestock reports, showing condition of range feed, cattle, and sheep, are issued monthly.
9. Shipments of stocker and feeder cattle and sheep into eight cattle, sheep leading States are published monthly.
10. Shipments of lambs from Western feed lots are published weekly from January through May.
11. Livestock slaughter, by States, including number of head and live weight, is estimated monthly. National estimates of meat and lard production, including the dressed weight of beef, veal, pork, lamb, and mutton are published monthly and annually.

ESTIMATES OF LIVESTOCK ON FARMS JANUARY 1

The census of agriculture every five years provides an enumeration of livestock on farms and ranches by species, sex, and by certain age classes. Where the census enumeration relates to January 1 and has been completed promptly, the census data for a given species are usually accepted as the official January 1 estimates for that species. Before acceptance, however, Census data for each State are carefully reviewed to ascertain the completeness of coverage of number of farms, farm land, and the individual species of livestock. In appraising the completeness of the census enumeration, all available information on the subject is considered. Previous census enumerations, taxation records, State censuses or other enumerations where available, and records of the movement and disposition of crops and livestock are used in the analysis. Often a census enumeration will be considered complete in coverage of farms yet the totals for a particular species of livestock will be incomplete. This situation is common in the commercial livestock-feeding areas where numbers change rapidly from week to week. Records of livestock shipments into and from these areas provide a check on the completeness of the census enumeration of the different species.

When the census enumeration is taken as of April 1 or some other date, allowances need to be made not only for possible incompleteness of the census, but also for changes in livestock numbers between January 1 and the date of the enumeration in order to establish a bench mark estimate for January 1.

Two techniques are used in converting the

April 1 Census data to a January 1 base. A matched sampling technique is used to obtain indications of the change in number between January 1 and April 1. Respondents who replied to the regular livestock surveys relating to inventories on January 1 are sent inquiries to reach them in April about the time the census enumeration is being made. This inquiry includes questions worded identically with those asked by the census. The indicated changes estimated from the matched sample are applied to the census totals to obtain a "January 1 equivalent" number. Another method, adaptable to the meat animals, involves using the monthly records of livestock marketings and slaughter for the period January 1 to the date of the enumeration to arrive at a "January 1 equivalent" number.

Fairly comprehensive and complete records compiled on livestock marketings and slaughter by months permit estimates to be made of the net disappearance between January 1 and the date of the census enumeration. The net disappearance includes marketings, slaughter, and deaths minus livestock imports or inshipments. Births are not included because the census ex-

cludes by definition animals born after January 1 of the year of enumeration. The total net disappearance is added to the April 1 census totals to arrive at an indicated January 1 equivalent number.

The manner of arriving at an indicated January 1 equivalent number (through the use of results from the special survey and matched sample and the use of disappearance estimates) is illustrated in the summary sheet used for processing the revisions (fig. 25). Note the box in the lower left hand corner of this summary sheet. In the case illustrated, the indicated January 1 equivalent number from the two approaches differed by only 1 percentage point. The estimate accepted by the Crop Reporting Board in this case was slightly higher than either of the indicated bench marks for 1940 because allowance was made for a small degree of incompleteness in the census returns.

Once the bench mark estimates have been established, the problem is to make current estimates of the year-to-year changes. The December rural carrier survey provides the basic information used in making the estimates of change. Unaddressed cards with questions on

FIGURE 25.—Cattle—1935-40 Revision Work Sheet.

inventory numbers of the different species and classes of livestock (C.E. 2–8290 in Appendix D) are distributed to farmers along the rural mail routes by the rural carriers. After the cards are filled out the carriers collect them. The cards are then forwarded to the respective State offices. Other mailed inquiries such as the Western Sheep Survey (C.E. 2–8323 in Appendix D) and Western Cattle Survey (C.E. 2–8293 in Appendix D) are used to augment the rural carrier samples to obtain more representative samples in areas where the rural mail routes are lacking, or sparse, or nonrepresentative.

The sampling rate of the rural carrier survey differs by States depending on the individual needs of the State for basic livestock information. Where county estimates of livestock populations are made on the basis of information obtained through rural carrier surveys, the State samples are necessarily large in order to provide dependable indications of change by counties and crop reporting districts. Where the sample indications are not used to prepare estimates for an area smaller than the State, the samples are smaller. In general, it has been found that in the principal livestock-producing States a well-distributed sample of 3,000 to 6,000 farms that have livestock will produce estimates of serviceable accuracy.

A number of different indications of changes in inventories and of the relationship of specific items (such as age and sex classes) to the total inventory are computed from the tabulations, which are set up to provide for totals by crop reporting districts. Summarizing the data by crop reporting districts also facilitates weighting the indications, when this is necessary. Summaries (C.E.F. 31, Appendix E) are transmitted to the Washington office along with the work sheets (C.E.F. 59, Appendix E). The work sheet provides for recording indications from the surveys and other sources that are used in the analysis and interpretation of the data and for recording the estimates. Regression charts are used in both the field and the Washington office to facilitate interpretation of the data. These charts are prepared for each State by plotting the Crop Reporting Board's final estimates of the actual number for a series of years against the computed sample average number per farm for each of the years. An estimate for a given species can be read directly from the chart, using the average for the species as computed from the current rural carrier sample (fig. 26).

Another indication of change in inventory numbers is developed from matched samples. In this scheme, a special tabulation is made including all farmers who have reported in both the current and the previous year. The board's
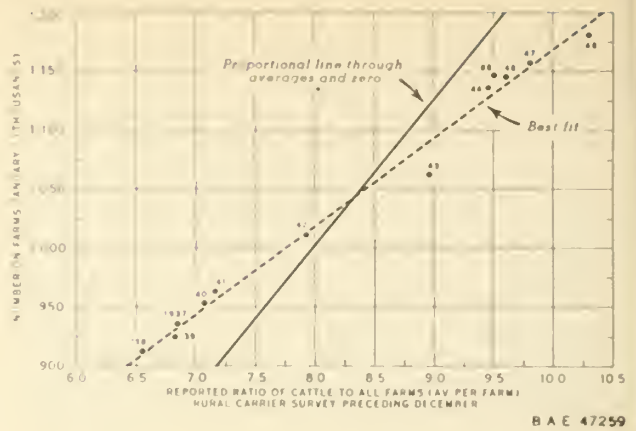
FIGURE 26.—Cattle on farms January 1, Georgia: Relation of average number reported per farm on December rural carrier survey to official estimates of total number the following January 1, 1938-48.

estimate for each year as a percentage of the previous year is plotted against the relationship of the year's numbers to last year's numbers shown by the matched sample. A current estimate of the numbers of the species or class in question as a percentage of the number the preceding year can be read from the chart based on the current identical indication. This percentage estimate can then be applied to the absolute estimated number for the previous year to obtain an absolute estimate for the current date (fig. 27).
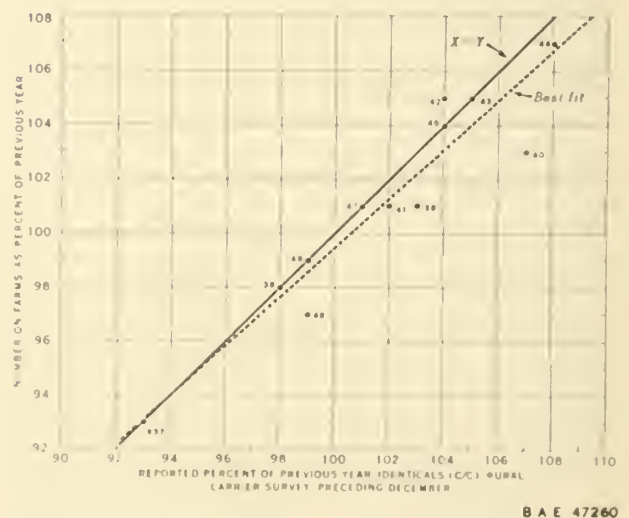
FIGURE 27.—Cattle on farms January 1, Georgia: Official estimates of numbers on farms as percentages of previous year's estimates in relation to percentage relationship between number reported in current year and number reported on same farms in previous year, on successive December rural carrier surveys.

In States west of the 100th meridian, variation in cattle and sheep numbers between farms and ranches is so large that the averages per farm or per 100 acres are not considered dependable indications for most kinds of livestock. If facilities were available for intensive use of list sampling of large farms, the average per farm, with proper stratification and varied rates of sampling, would be a more reliable measure of change. For this area of the country questionnaires are designed to obtain reports on the number of cattle and sheep that were on hand a year earlier as well as the current number on the farm or ranch. The summary of the two series—on hand now and on hand a year earlier—provides an indication of change in numbers as between the years. This indication is referred to as the current historic percentage (C/H percent).

It will be noted that the respondent is asked to recall the number on hand a year earlier. Experience with this indication of change has shown that it is subject to bias, either memory or intentional. A matched-sample technique provides a basis for measuring the extent of this bias. By matching reports for livestock producers who returned questionnaires both this year and last year, a comparison is made between the change shown by their reports on numbers currently for each year, current to current (C/C percent), and the change shown by the current year's report on the numbers reported for this year and for last year (C/H percent). The difference between the two indications as computed from the matched sample provides an adjustment factor for correcting the C/H percent for the entire sample. For example, if the C/H percent for the entire sample showed 103 percent and the matched sample showed respectively, C/H percent at 102 percent and the C/C percent at 100 percent, then 102 — 100 = 2 points bias, and 103 — 2 = 101 percent, the adjusted C/H percent. The adjusted C/H percentage is plotted on a chart against the board's final percentage change for a series of years. The current estimate of percentage change is read from the chart using the sample C/H percent adjusted for bias. The percentage change read from the chart is applied to last year's estimate to arrive at the current number.

For the meat animals—cattle, sheep, and hogs—it is possible in many States to use fairly complete records of marketings and slaughter, or railroad records, to arrive at an indicated change in inventory numbers. This is done by use of a balance sheet (C.E.F. 119, Appendix E). Marketings, slaughter, and an estimate of death losses during the year are subtracted from the total of inshipments, births, and the number on hand at the beginning of the year to arrive at the number on hand at the end of the year. The relationship between the indicated closing inventory and the opening inventory is used as another indication of change or as a check on the current estimate indicated by sample data. Records of marketings and slaughter and of rail shipments are used to construct a balance sheet which can be used as a check on State and U. S. estimates. In addition, these records can be used more directly to check estimates for the previous year. A knowledge of the livestock practices and marketing patterns in the various States permits the use of these records to check the accuracy of the inventory estimates. For example, the marketings of hogs from January through September are used as a check on the estimate of the number of all hogs on farms January 1. This check is made by using a regression chart and plotting the estimated number of all hogs on farms January 1 against the marketings for the period January-September.

Records of livestock assessed in 32 States form another important kind of data used to check estimates of inventory numbers. Experience shows that in many cases these records provide reliable indications of the year-to-year changes in numbers. In some cases, assessment records relate to January 1, in which case a direct comparison with the estimate is possible. But the dates of the assessments vary and in a few States the date is as late as June 1. When assessments do not relate to January 1, adjustments are made to arrive at a January 1 equivalent number by using records of disappearance between January 1 and the date of the assessment.

In some States that have an annual farm census, certain livestock items are enumerated each year. These data are considered to be dependable indications of change, though livestock are consistently underenumerated. Only a few questions on livestock can be included in a State farm census. As the assessor is the enumerator for the State farm census, information on numbers and kinds of livestock eligible for assessment is likely to be more incomplete than on items not eligible for taxation. In most cases the assessment or State census data are not available at the time the first inventory estimate is made. After the current estimate is made, it takes at least 6 months, and sometimes a year, for the records to be assembled in the form needed for checking purposes.

LIVESTOCK ON FEED FOR MARKET

Annual estimates of the number of cattle and sheep on feed for market are made as of January 1. As a basis for these estimates in the

North Central States (Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas), special inquiries are sent to cattle and sheep feeders asking for the number on feed this year and the number on feed a year ago. The percentage relationship computed from the sample is used as an indication of the change in numbers. Since the indication developed from the sample is a current/historic indication and may involve memory bias, a matched-sample technique is used to ascertain the adjustment factors needed to allow for such bias. The adjusted C/H percentage change is plotted against the board's final estimated change on a chart where the current adjusted percentage change can be read directly to arrive at a percentage estimate.

In addition to the information obtained on a sample basis, records are compiled on the number of stocker and feeder cattle and sheep moving into feeding States. All stocker and feeder cattle shipped from public markets are inspected by the Bureau of Animal Industry or State Veterinarians and records are available on the destinations of these inspected shipments. In addition, most of the important feeding States require inspections of cattle and sheep shipped direct so that a record is also available on direct movement (livestock shipped into the State from outside the State but not changing hands at a public market). The total movement into a given State for a period 4 to 6 months before the inventory date provides an indication of the number on feed. Charts are prepared for each State showing the in shipments plotted against the board's estimate for a period of years. An indication of the current number on feed is obtained by plotting the current in shipments and reading directly from the chart.

In many parts of the country, particularly in the Western States, feeding activities are concentrated in local areas where it is possible to obtain a complete enumeration or obtain records of the shipments into and out of the feeding areas. In the case of important sheep and lamb feeding areas, records of rail movements provide a basis for the estimates. A count is made on the number of cars shipped into and out of the area before the inventory date. Small allowances are made for death losses, and the indicated number remaining, based on railroad records, is accepted as the estimate. To check estimates of the number of cattle and sheep on feed, records of the number marketed from the feeding areas for certain periods after January 1 are used. These records are either receipts at stockyards and packers, by State of origin, or the rail movement out of the feeding areas after January 1.

Narrative reports are issued in October, November, and December each year, on developments in the cattle and sheep feeding situation. No surveys are made during these months, but field statisticians in States for which estimates of cattle and sheep on feed are published on January 1 assemble current information on factors that bear on the cattle-feeding situation, such as records of shipments of stocker and feeder cattle and sheep, feed supplies, prices, and other information obtained from informed individuals or through special sources. The State reports are reviewed in Washington, along with information available at the national or regional levels on the movement of livestock, supplies of feeder livestock available, prospective feed supplies, prices, and other conditions affecting the livestock industry. Summary reports giving the highlights in the month-to-month developments are issued about the 14th of the month.

As of April 1 and August 1, a report is prepared showing the estimated percentage change from last year in the number of cattle on feed, by States, for 11 Corn Belt (North Central) States. The estimates of percentage change are based on special mailed surveys sent to lists of cattle feeders. The techniques used in State estimates are much the same as described above for the January 1 numbers. The main difference is that the actual or absolute number of cattle on feed is not known, and only the relative change is estimated. In the past, funds have not permitted setting up bench mark estimates of the number of cattle on feed for April 1 and August 1 as was the case for the January 1 number. Lacking a census enumeration of cattle on feed for market for any date, bench mark estimates have to be based on other information.

For January 1, the records of shipments into the different States before January 1 and the marketings after January 1 could be used more effectively in establishing the level of the estimates than is the case for April 1 and August 1. One main advantage is that steers and heifers slaughtered under federal inspection for the first 4 or 5 months of the year consists mostly of fed cattle. An increasing but unknown proportion of this slaughter consists of so-called grass cattle during the period when the April 1 and August 1 inventories are being marketed. Thus records of marketing and slaughter cannot be used to as great an advantage as in the case of the January 1 numbers. At the same time, cattle shipped in after January 1 are mainly replacements, with the volume small in relation to the number on feed, making records on in shipments for a selected period before the April 1 or August 1 date of much less value in determining the level of

feeding for April 1 and August 1 than is the case for January 1.

During 1948, however, substantial progress was made in the work relating to cattle on feed. A project for collection of data and establishing a quarterly series of estimates of cattle on feed was started in five States (three Corn Belt and two Western States) through funds provided by the Research and Marketing Act of 1946. In addition to total inventory numbers of cattle on feed, the project provided for developing estimates of kinds of cattle on feed (steers, heifers, calves, etc.), classification according to weight, length of time on feed, intended marketings, and the kind and quantity of feed used in the fattening rations. The main statistical problem involved was establishing a quantitative series based on mailed inquiries without the support of the usual census bench marks or an enumerative sample survey whereby such bench marks might be established. In the three Corn Belt States concerned, the sampling plan was based on semicontrolled mail sampling. In two of the Western States, the plan was a combination of area enumeration and mailed sampling with a follow-up on the nonresponses. This plan was adopted because of the character of the feeding enterprise in the Western States. In some areas in these States feeding is highly concentrated with a few individuals holding large numbers of cattle on feed, whereas in other areas the feeding enterprise is carried on by a fairly large number of scattered feeders with small numbers on feed.

Using Nebraska as an illustration, the use of semicontrolled mailed sampling involved the random selection of about 2,000 names of cattle feeders from the State Farm Census. This number made up about 8 percent of the universe of 26,000 feeders. Feeders were identified by replies to a question relating to cattle placed on grain feed for market. For every farm randomly drawn, certain control data were abstracted from the State Farm Census record of individual farm reports. The control data were as follows: Land in farms, acres of corn, sows farrowed, and cattle and calves placed on feed. Follow-up procedures were used and returns from the follow-up were summarized separately.

Using controls permitted adjustments to be made for selectivity of the mailed return. Control data for each of the feeder farms responding by mail and the items from the questionnaire were tabulated together, and totals and averages were obtained. The entire sample average number of cattle on feed per farm, including the follow-up returns, was adjusted downward, based on the respondents' average for the control item "cattle placed on feed" in relation to the average for the universe. The ad-

justed average number of cattle on feed per farm was expanded to an estimate by multiplying by the number of feeder farms. After the first quarterly estimate is established, a matched-sampling technique using reports from the same feeders on two successive quarterly dates provides an additional indication of cattle on feed.

To test the accuracy of the estimate obtained by the procedure just described, records were obtained on the marketings for slaughter of beef steers by grades (Choice and Prime, Good, Medium, and Common). This classification at three important markets that receive about 85 percent of the marketings of Nebraska cattle provided a fairly dependable check on the estimate. It was concluded on the basis of these data that the estimating procedure was sound and that satisfactory estimates could be prepared for Nebraska.

In Iowa, the techniques used, as well as the results obtained so far, are the same as in Nebraska.

Not having satisfactory control data from the State Farm Census in Illinois, the sample and control data were drawn from the rural carrier survey. This necessitated another adjustment involving a correction for farm size in the rural carrier distribution of cattle farms to conform with the Federal census distribution. The rural carrier survey includes a smaller proportion of the small farms that have only a few head of cattle than does the Federal census. Few, if any, of these small farms are engaged in cattle feeding. Hence, average number of cattle on feed per farm as shown in the rural-carrier survey was adjusted downward by the extent of the correction needed to conform to the census distribution of cattle farms. This average was accepted as the "universe" average. The Illinois sample was drawn at random from the rural carrier returns reporting cattle on feed the previous December. To pick up new feeder farms, a random sample was selected from those not reporting cattle on feed to determine how many new feeders were engaged in cattle feeding in the current season. Otherwise, the procedures were the same as used in Nebraska. Because of the wide variations in base information for use as control data in different States, further studies need to be made to adapt the procedure to other States.

HOGS MORE THAN 6 MONTHS OLD ON FARMS JUNE 1

An estimate of the number of hogs more than 6 months old on June 1 is made each year for the United States. Although estimates by States have not been published, the estimate for the United States is the sum of unofficial

estimates for the individual States. Indications developed from the June 1 rural carrier survey furnish primary basis for the June 1 estimate of hogs over 6 months old. The June 1 rural-carrier survey is conducted in the same way as outlined for the December 1 survey. Questions relating to the number of hogs over and under 6 months as of June 1 are carried on the schedule. Estimates for June 1 numbers of hogs over 6 months old do not have the benefit of a census enumeration bench mark as is the case with the January 1 numbers. The level of the estimates has been ascertained by States and for the United States by using records of marketings and slaughter of hogs for the period of June through September. It has also been possible to project roughly the census enumeration of hogs on April 1 to a June 1 date. Since a large proportion of the hogs slaughtered in the country are slaughtered under Federal inspection, it has been possible to set up reasonably accurate estimates for the June date. Currently, the average number of hogs over 6 months old, per farm, as computed from the rural carrier survey is used to estimate the June 1 total number. This is done by using a chart on which the June 1 averages are plotted against the estimated June 1 numbers. The percentage relationship as computed from a matched sample of June 1 indications is also used in connection with a regression chart, plotting the number estimated by the Crop Reporting Board each year as a percentage of the previous year against the survey identical percentage. On the basis of these indications, estimates are prepared by States and totals are obtained for regions and the United States.

LIVESTOCK BIRTHS

Estimates are prepared, of the number of pigs and lambs saved and of the number of calves born, using techniques similar to those used for the inventory numbers. One main difference is that census data relating to births have not been regularly available, although some questions on livestock births were obtained in the 1930 census. In making estimates the number of breeding animals on farms is used.

The estimates by age and sex classes as of January 1 provide the estimates of cows 2 years old and over and ewes 1 year old and over. Census enumerations have furnished a bench mark for the number of sows farrowing in the spring season but not for those farrowing in the fall season. With an acceptable bench mark for the number of sows farrowing in the spring season, reports on the June and December surveys relating to the number of sows farrowing or intended for farrowing provide the informa-

tion that is used to estimate the year-to-year changes. The rural carrier surveys include questions on the number of pigs saved so that it is possible to derive from each survey the average number of pigs saved per litter. Questions on the number of ewes and the number of lambs saved, from which is derived the relationship of lambs saved to ewe numbers are, also included in the June rural carrier survey. Information on the calf crop is obtained on the January 1 livestock disposition survey. A schedule is sent to livestock producers to obtain information on farm slaughter, deaths, and other items (C.E. 2–8320, Appendix D).

The questions on cattle include questions on the number of cows 2 years old and over and the number of calves born in the previous year. From this survey the percentage calf crop is computed by dividing the number of calves born by the number of cows 2 years old and over. In this computation the calf crop is expressed as a percentage of the number on hand at the end of the year. In the case of the lamb crop (estimated on the basis of information from the mid year livestock surveys) the number is expressed as a percentage of the number reported for the beginning of the year. To avoid dealing with memory bias, reporters are not asked to report the number of cows on hand at the beginning of the year when reporting on the calf crop. Instead the calf crop is expressed as a percentage of the cows at the end of the year and this percentage is adjusted to a beginning-of-the-year basis by the following steps: (1) The computed percentage calf-crop is multiplied by the number of cows 2 years old and over at the end of the year to obtain the number of calves born. (2) This number of calves born is divided by the number of cows at the beginning of the year to arrive at an adjusted percentage calf crop.

Charts showing the adjusted percentage calf crop as the independent variable and the estimated percentage calf crop as the dependent variable are used in arriving at the estimated percentage calf crop for each State. Lacking a census bench mark on the number of calves born, the relationship between the adjusted reported percentage calf crop and the estimated percentage was figured for each State on the basis of inventories and records of marketings and slaughter.

The method used for estimating the lamb crop is much the same. As survey data include the number of breeding ewes at the beginning of the year, no adjustment is necessary in the reported percentage lamb crop. Charts similar to those used for the calf crop are used for the lamb crop. For the native sheep States the reported lamb crop as a percentage of *all* ewes is derived. (The term "native" is applied to

States where sheep raising is conducted under farming conditions as distinguished from "Western" where sheep are raised on large scale operations and under open range or big pasture conditions.) For the Western States the lamb crop percentage is computed using ewes 1 year old and over. Changes in the reported age classification of breeding ewes between January 1 and June 1 are avoided in the native sheep States by using all ewes. This is not a difficulty in the Western States.

The relationship between the reported percentage lamb crop and the estimated percentage was based on research studies of numbers of breeding ewes reported in the December and June livestock surveys over a 5-year period. These studies showed breeding ewes reported for January 1 in the mid-year surveys were consistently below the number reported currently for December 1. Consideration also was given to the level of inventory estimates and records on marketings and slaughter both on a State and national basis.

In arriving at the estimate for the spring pig crop, the first step is to make an estimate of the number of sows farrowing in the spring. Regression charts are used for both the average number of sows farrowing per farm and for the change shown by the matched sample. The procedure used in making the estimate of sows farrowing is much the same as for estimating the January 1 number. After an estimate has been made of the number of sows farrowing in the spring, the pig crop is ascertained by multiplying the number of sows farrowing by the average number of pigs saved per litter as computed from the June rural carrier survey.

For the fall season the procedure is somewhat similar except that, lacking a bench mark for the fall period, it is necessary to tie the fall estimate to the spring estimate. Indications of this relationship are obtained by computing the ratio of fall to spring sows from the average number of sows per farm from the June and December surveys. Questions relating to the number of spring and fall pigs reported on the livestock disposition schedule also provide an indication of the relationship of the fall pig crop to the spring pig crop.

For most of the important hog-producing States and for the United States as a whole, it is possible to check the estimates of the pig crop by using records of marketings and slaughter for certain periods. For example, marketings and slaughter for the period October through March are used to check the size of the spring pig crop, and records for April through September are used to check on the fall crop. In using these data the number of head marketed and slaughtered is converted to sows by dividing by the estimated number of pigs per litter. Estimates made by the Crop Reporting Board of the number of sows farrowing for the respective periods are plotted on charts directly against the indicated number of sows, based on records of marketings and slaughter. Changes in feeding practices, together with liquidation of inventory numbers, sometimes affect the usefulness of marketing and slaughter data as checks against the estimates. In some cases these check data are a better indication of the total yearly pig crop, particularly in years when there are marked changes due to adjustments in inventory numbers or to variations in the average weights at which hogs are being marketed.

The estimates are made of the number of sows bred and to be bred for farrowing in the spring and fall using the same general procedure as used in making the spring and fall estimates of the number of sows farrowing. In the case of these breeding intentions, however, consideration is given to the feed supplies on farms and the relative prices of hogs and corn, particularly in the North Central States. Charts are used that show the relation between feed supplies and the hog-corn ratio and changes in the number of sows farrowing.

Current estimates of the number of sows farrowing each month have been prepared and published in Iowa since July 1948. This is a State research project made possible through funds provided by the Research and Marketing Act of 1946. The sampling plan involves the use of the monthly crop reporter list with State Farm Census control data on spring sows used to correct for selectivity of the respondents. For each monthly crop reporter on the list individual data are abstracted from the State Farm Census relating to the size of farm, corn acres, spring sows farrowing, and fall pigs saved. Questions asking sows farrowing and pigs saved during the preceding month are added to the monthly General Schedule. Control data are tabulated along with the monthly report of sows farrowed. The reported average number of sows is adjusted by the relationship of the sample control data on spring sows per farm to the universe (State Farm Census) average of spring sows per farm. The reported adjusted number of sows per farm is expanded to an estimate by multiplying it by the number of farms in the State.

ESTIMATES OF FARM PRODUCTION, DISPOSITION, CASH RECEIPTS, AND GROSS INCOME FROM MEAT ANIMALS

Although annual estimates, by States, of the quantity and value of crop production had been issued for a long time, similar estimates for the principal meat animals—cattle, hogs, and sheep—have been made only since 1924.

Estimates of livestock production are not as

readily made as estimates of crop production. Crops are raised in definite yearly quantities that are ordinarily estimated by multiplying the estimated harvested acreage by the estimated yield per harvested acre. Estimated crop production is in terms of fairly uniform units, as bushels, bales, or tons. Crops are produced entirely within the locality in which the acreage is located. Livestock production, on the other hand, is not in definite yearly amounts; it comes from an addition to numbers resulting from births and from an increase in weight due to growth of young animals toward maturity. Only a fraction of the animals that are born ever reach maturity, for disposition is continuous, with no uniformity in ages or weights at slaughter or in the proportions disposed of from year to year. Livestock production is not always completed within the locality in which the animals are born. There is an extensive movement of unfinished animals out of some States into others to be "grown out" or "finished"; the weight added to these animals is counted as livestock production.

There are three distinct operations in the methods developed for ascertaining the yearly amount of livestock production by States. The first is concerned with inventories. The number of each species, as estimated at the beginning and end of each year, is separated into significant age and sex groups. The average weight per head of each of these groups is estimated and the sum of the total weights of all groups gives the total inventory weights at the beginning and end of the year. The difference between these total weights is the difference in inventory. Although differences in feed supplies, weather, and other factors, from year to year doubtless result in differences in average weights of different classes of each species at the end of each year, specific data on inventory weights per head are lacking. Therefore, the estimated average inventory weights per head of the various age groups are generally held constant from year to year.

The next operation is to determine the items of increase and decrease that are responsible for the changes in inventory numbers during the year. For this purpose State balance sheets (C.E.F. 119, Appendix E) are prepared, on which estimates are entered for each species, on the debit side, of the number on hand at the beginning of the year, the number of young animals born (or saved), and the number shipped into the State; and on the credit side, of the numbers shipped to markets, sold locally for slaughter, slaughtered on farms, and lost through accident or natural causes. The sum of the credit subtracted from the sum of the debits gives the number at the end of the year.

The third operation is to convert into pounds the items in these balance sheets that are factors in determining the amount of production. This is done by multiplying the number of head of livestock by an estimated average weight per head. These total weights are then combined to arrive at the total production. The method of combining these is as follows: The total weight of animals shipped, sold for local slaughter, and slaughtered on farms (which represents the amount disposed of during the year) is obtained; from this total is subtracted the total weight of animals shipped into the State during the year. The resulting difference is then either increased or decreased according to the change in total inventory weights. This final amount represents the total production in pounds.

The value of this production is figured by multiplying the total pounds produced by the weighted average price per pound as received by farmers. The price is obtained by weighting the monthly farm prices by each month's proportion of the total yearly marketings. The inventories at the beginning and at the end of the year are not evaluated; hence, changes in inventory values due to change in unit values are not included in value of production except that changes in *physical* inventories are evaluated, as described above. In this procedure the animals shipped into the State are not evaluated at an average cost; only the increase in weight of these is evaluated, not separately, but as a part of the total production. Animals that die are not considered as animals produced In the case of young animals that die within the year in which they were born, no consideration is given them in the production figures. Animals that were in the beginning-of-the-year inventory, and that die during the year, are included in the previous year's production but are deducted from that of the current year. These inclusions and deductions, however, are made in the balance sheets and not in the actual production figures.

The procedure used to estimate farm production from meat animals permits the computation of cash receipts and gross income from meat animals. To obtain cash receipts, the estimated marketings and slaughter (in terms of pounds), by States, are multiplied by the respective seasonal average prices. To this product is added an estimated value of meat sold from farm slaughter. Gross income is the sum of the cash receipts and the value of farm slaughter for home consumption.

ESTIMATES OF WOOL AND MOHAIR PRODUCTION

In the case of wool, census data have been available every 5 years on the number of sheep shorn and wool produced. These items provide

information for the bench mark estimates. Wool production is estimated by ascertaining the number of sheep shorn and the average weight per fleece. Basic survey information from the June rural carrier survey and from the Special Western Sheep Survey provides the indications used in making these estimates. Producers are asked to report the number of sheep shorn and pounds of wool produced. From this information the average weight per fleece is derived. Comparisons made between reported inventory numbers and reported numbers shorn over a period of years have determined the relationship of the number shorn to the total inventory. The percentage shorn fluctuates very little from year to year in the native States. The main change in numbers shorn is due to the over-all change in inventory numbers of sheep. In the Western States, information is obtained on the losses of sheep between January 1 and the date of shearing, and the percentage loss is used to adjust the January 1 inventory to the number of sheep and lambs shorn.

The average weight per fleece (United States census) in relation to the survey averages has largely determined the level of the average estimates of fleece weight. The current estimate is interpreted on a chart, plotting the board's average weights for a series of years and the derived census weights against the derived survey weights. The preliminary estimate of shorn wool made in July takes into account allowances for fall shorn wool in States where fall shearing is practiced. Because sheep and lambs on feed are sometimes shorn in several of the feeding areas in the country, separate estimates are made of the quantity of wool shorn in feed lots. These estimates are based on enumerations of the quantities so produced. When the final estimate is made, in March of the following year, records have been assembled on the railroad shipments of wool from many of the important areas and records of boatloadings are available. When necessary, the preliminary estimates are revised in line with these shipment records. For the United States as a whole, records of domestic wool consumption and stocks are available from reports published by the Bureau of the Census, and these have been used as checks against the annual estimates for the country as a whole. During the war, the Commodity Credit Corporation bought practically all of the wool in the country, and records of its appraisals and purchases were used as a check on the estimated total for the United States.

Estimates· of the production of pulled wool are based on mailed reports received from practically all of the pulleries in the United States. Pulleries report on the total quantity of pulled wool produced and the average weight of pulled wool per skin.

Estimates of the number of goats clipped and of mohair production are prepared for seven principal producing States. The preparation of these estimates is by much the same methods as used for wool production. One main difference is that, except for Texas, no official estimates are made for the January 1 inventory of goats. Thus the estimated number of goats clipped in six of the States is not dependent on the January 1 inventory number as in the case of the estimates of sheep shorn. Estimates of the number of goats clipped are based on (1) sample returns from mohair producers who report goats clipped and production of mohair, and (2) records of mohair received at warehouses, purchased by dealers, or shipped by rail or boat. In Texas, Arizona, and New Mexico, information is obtained separately for spring and fall production, for goats and kids clipped, and for production of mohair and kid hair. Assessed numbers of goats are used as check information on numbers in all seven States, and census data on Angora goats clipped, mohair produced, and average clip per goat, provide the basis for bench mark estimates.

WESTERN RANGE AND LIVESTOCK REPORTS

Monthly reports showing the reported condition of range feed, cattle, and sheep, and descriptive comments on conditions and other matters are released from the office of the Western Livestock Statistician at Denver, Colorado. The reports are based on returns from a mailed inquiry sent each month to ranchers and stockmen in 17 Western States. These respondents are asked to report their appraisal of conditions of range feed (Budget Bureau No. 40–R323.1 Appendix D), cattle, and sheep in their localities. The information is summarized by districts in each State. The State Statistician reviews the data and prepares a report each month which is forwarded to the Denver office. The State Statistician includes in his report the summary of the survey as well as his observations on the general livestock and feed situation for the State.

Two special reports are issued each year in April and June for the Osage and Flint Hills pasture section of Oklahoma and Kansas. In addition to reporting on conditions in these sections, the report covers leasing of pastures and rates charged, estimates of the number of cattle shipped into the pasture area, and the cattle population of the area on January 1. Estimates of the number shipped in are based on records obtained from stockyards and railroads, and brand and health inspection services. The

inventory estimates for the area are developed
in much the same way as the inventory esti-
mates for the State.

SHIPMENTS OF STOCKER AND FEEDER CATTLE AND SHEEP INTO EIGHT CORN BELT STATES

A monthly report is developed from records
of health inspection maintained by the offices
of the State Veterinarian in eight North Cen-
tral States. Livestock shipped into these States
for breeding are required to have a health cer-
tificate. If such shipments originate or stop for
feed, water, and rest, at public stockyards, they
are inspected by the United States Bureau of
Animal Industry. Direct shipments are accom-
panied by a health certificate or are inspected
at the point of destination. The monthly sum-
mary of these records shows shipments from
public stockyards and direct shipments sep-
arately. These data provide current information
on the movement of livestock into the impor-
tant feeding sections of the country.

WESTERN LAMB SHIPMENTS

To provide current information on sheep and
lambs marketed from important feeding sec-
tions, weekly reports are prepared covering the
period from the last half of January to May 1.
These reports show shipments by weeks from
three outstanding lamb-feeding sections in Col-
orado, Nebraska, and Wyoming. In addition,
estimates of the number of lambs remaining
on feed are made biweekly. The estimates of
shipments, as well as the estimates of the num-
ber remaining in the areas, are developed from
records of railroad and truck shipments from
the areas.

ESTIMATES OF LIVESTOCK SLAUGHTER AND MEAT AND LARD PRODUCTION

Estimates that are prepared on livestock
slaughter and meat and lard production repre-
sent a combination of enumerated data for part
of the universe and estimated totals for the
rest of the universe. The Bureau of Animal
Industry of the Department of Agriculture, in
connection with its regulatory functions relat-
ing to meat inspection, compiles a report on the
number of animals slaughtered under Federal
inspection each month. The proportion of total
commercial slaughter that is federally inspected
varies between species, being practically 90
percent in the case of sheep and lambs but less
than half of the total in the case of calves.
As of January 1949, there were 459 slaughter-
ing establishments operating under Federal in-
spection. The total number of slaughterers not
under Federal inspection in the entire country
in 1949 was estimated at about 19,000 estab-

lishments, including butchers who slaughter
only in certain seasons. This is the universe
for which estimates on the number of head
must be made. Estimates for the nonfederally
inspected slaughter universe are made by
States. These estimates include the number of
head slaughtered, average live weight, total live
weight, yield of lard per 100 pounds, and pro-
duction of lard.

The nonfederally inspected slaughter universe
is stratified by size groups. The stratification
varies by States according to the type of es-
tablishment. In general, the universe is broken
down into three size groups called wholesale,
local, and butcher. The "wholesale" group in-
cludes establishments that slaughter 2,000,000
pounds live weight or more annually and spe-
cialized slaughtering establishments which usu-
ally slaughter a sizable number of a single spe-
cies. Slaughtering establishments in the "local"
group are plants the annual output of which
ranges from 500,000 to 2,000,000 pounds. The
"butcher" group comprises slaughterers that
average less than 500,000 pounds a year. An
attempt is made to obtain complete coverage
of the wholesale group. This is done by mailed
inquiry, by telephone calls, or by personal
visits.

The techniques employed in estimating the
number of head slaughtered each month involve
separate indications and expansions for each
group. The matched-sample technique, with re-
ports for the current month matched against
reports for the previous month, is employed
here also. Separate estimates for each slaugh-
ter group are prepared, and the estimates for
the total are the sums of the estimates for the
individual groups. Research on methods of ex-
pansion has shown that for both the local and
wholesale groups a ratio to slaughter during a
base period is a more efficient indication for
use in expansion to a total for the universe
than the average per plant.

For the butcher group, there is little differ-
ence in efficiency between the average per plant
and the ratio to base slaughter methods of ex-
pansion. In using the ratio to base slaughter
method of expansion, it is necessary to estab-
lish a base slaughter for the number of head of
each species slaughtered for each plant in the
group. The current slaughter is expressed as a
percentage of the base slaughter, and this per-
centage is applied to the total base slaughter
of the group to obtain an indication of total
slaughter by the group. In algebraic form,

$$\frac{\text{Reported slaughter during current month}}{\text{Base period slaughter in reporting plants}} \times \text{Estimated total slaughter in base period} = \text{indicated slaughter during current month.}$$

The reports on live weight and number of animals slaughtered make possible the derivation of the average live weight of animals slaughtered. This average is used in determining the official estimates of average and total live weight. The estimates made of livestock slaughter permit the preparation of estimates of the production of meat and lard in the United States. Information on dressing yields and dressed weight for slaughter under Federal inspection has been collected by the Department of Agriculture through voluntary mailed returns since 1924, when the program for estimating slaughter and meat production was started.

No information is gathered on dressed weight for noninspected slaughter. The current dressing yield is estimated on the basis of monthly relationships between inspected and noninspected establishments. During the period 1943 to 1945 monthly information on dressed weight and dressing yields was obtained under the slaughter control programs which required slaughterers to make complete reports on numbers of head, live weight, and dressed weight. The estimates on nonfederally inspected slaughter are combined with similar estimates for federally inspected slaughter to obtain the totals for all commercial slaughter by States and for the United States. For farm slaughter, only annual estimates are made. These estimates are based on information obtained from the rural carrier livestock surveys, the General Schedule, and the Livestock Disposition Schedules on which questions have been included to obtain indications of average live weight and lard yield.

The present project on livestock slaughter by months was inaugurated in 1946. Before the war the only information available by months was for federally inspected slaughter. Information on noninspected slaughter was obtained on an annual basis.

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Data on numbers of milk cows on farms at the beginning of the year have been compiled since 1867, but statistics on other phases of the dairy industry have developed largely in the last 35 years. In 1917, under provisions of the War Emergency Act of World War I, the Department of Agriculture began to collect and to publish data on dairy products manufactured in plants. In the middle nineteen twenties a program on collection, analysis, and publication of statistics on farm production, utilization, and income of milk was initiated. Since then, the statistical work has gradually expanded in coverage and detail until at the present time comprehensive series of weekly, monthly, and annual reports relate to most phases of the dairy industry.

The Statistical series prepared under the direction of Agricultural Estimates are divided into two main categories: (1) Production of milk on farms and factors affecting it, and (2) output and operations of primary dairy processing plants. As the collection and handling of the statistical information in these categories involve different sources of information, methods of operation, and estimating problems, details of the two are discussed separately.

FARM PRODUCTION AND UTILIZATION OF MILK AND RELATED STATISTICS

The principal published statistical series relating to farm-dairy operations may be classified into the following general groups: (1) Number of milk cows on farms, (2) milk production per cow, (3) total production of milk and butterfat on farms, (4) production and sales of farm-churned butter, (5) farm disposition and income from milk, (6) rations fed to milk cows.

Certain general characteristics apply to most of the statistical series relating to farm production and disposition of milk. General levels of the estimates are established on the basis of a careful review and analysis of all information available in base years for which census of agriculture enumerations are available. Intercensal year annual and monthly estimates are based primarily on interpretation of information obtained from sample groups of farm reporters. The initial series of estimates are established on the basis of data covering one or more census periods. Year-to-year changes are determined from sample data and their re-

lationship to historic estimates. At 5-year intervals, estimates currently established are reappraised on the basis of the more complete information available from the Census and from other sources.

Number of milk cows on farms.—Information used to determine the general level of the estimates of monthly and annual numbers of milk cows on farms includes census of agriculture enumerations of cows milked during the year, annual assessment data of numbers of milk cows or cows milked in States in which such data are available, and expansions of various sample data relating to numbers of milk cows. Estimated year-to-year changes in numbers of milk cows are based primarily on reports from farmers as to the number of milk cows in their herds as obtained in the semiannual Rural Carrier Livestock Surveys, supplemented by data from general crop reporters and special dairy surveys, and a year later by annual assessment data. Analysis of the Rural Carrier Livestock Survey information obtained in December is directed toward establishing an estimate of number of cows and heifers 2 years old and over kept for milk on January 1 as a part of the inventory classification of all cattle on farms. This estimate, with proper adjustment as to level, is used as a year-end indication of changes in numbers of milk cows. The June Rural Carrier Livestock survey provides a midyear indication of changes in numbers of milk cows. The monthly and annual estimates of milk cow numbers are based on the coordinated analysis of results obtained in these surveys and other information. Characteristics of the Rural Carrier Livestock survey data, and the methods used in preparing estimates of January 1 numbers of cows and heifers 2 years and over kept for milk are discussed in chapter 11 under "Estimates of Livestock on Farms, January."

To reduce the number of cows and heifers 2 years old and over kept for milk January 1 to a producing-milk-cow basis, an estimate of the number of heifers 2 years or more of age but not yet fresh is deducted. The number of heifers not yet fresh is determined from the number of heifers 1 to 2 years of age kept for milk cows the preceding January 1, and an estimated percentage of these heifers that did not freshen during the intervening 12 months. The percentage not freshening used in this calculation is based on average age of freshening; it varies
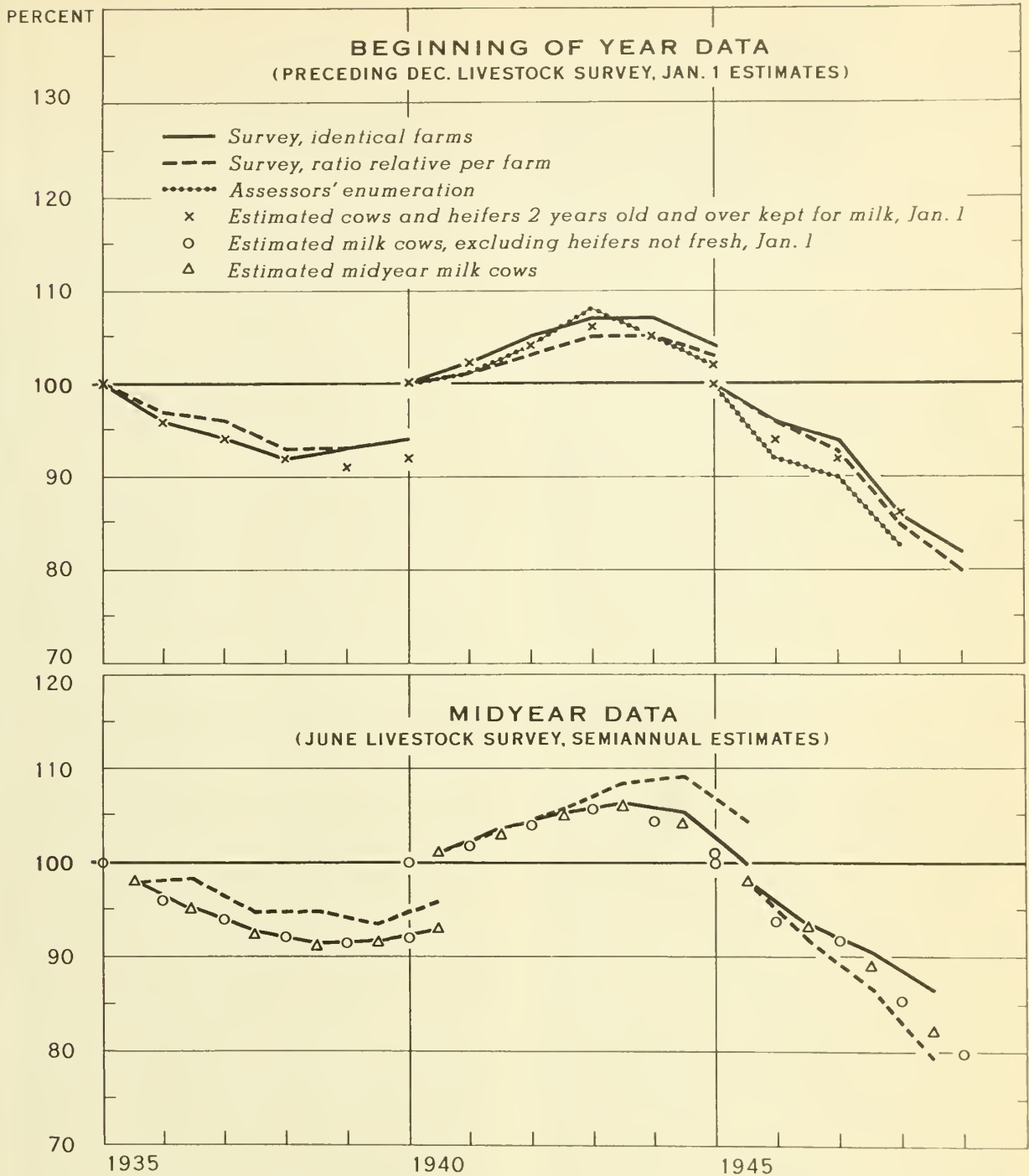
FIGURE 28.—Milk cows on farms in Iowa as percentage of base year 1935-49: Rural carrier livestock survey indications, assessors' enumerations, and Board estimates.

by States from 17 to 32 percent according to breed of cows milked, rate of growth of young stock and differences in methods of husbandry practiced. The number of cows in milk-produc-

ing herds that is obtained after deducting heifers not fresh serves as an indication of the year-end level of numbers used in determining both monthly and annual average estimates of

number of milk cows on farms. Excluding heifers not yet fresh results in a number of milk cows in producing herds that is 5 to 10 percent smaller than the estimate of cows and heifers 2 years old and over kept for milk on January 1. Estimates of monthly and annual numbers of milk cows on farms also differ from the January 1 series in that they represent average numbers over a period of time, that is, a month or a year, rather than the number on a single date. However, the two series are closely related and changes over time follow a similar pattern.

For estimating monthly numbers of milk cows, a base-year line chart is used on which both the December and June Rural Carrier Livestock Survey data are shown. Figure 28 is an example of the base-year chart. The beginning of each census year is used as a base of 100 percent. In the top section of the chart, December survey data and January 1 estimates of numbers of cows and heifers 2 years old and over kept for milk are recorded in terms of cumulated percentage of base. In the lower section of the chart, the year-end and midyear data are coordinated into a continuous series. Computations of January 1 milk cows excluding heifers not fresh are used to establish the base-year percentages plotted at the beginning of the year. The midyear survey indications are obtained from the June Rural Carrier Livestock Survey. To establish the June survey data as a percentage of January, a midyear starting point 6 months from the base Census date is estimated in terms of percentage of the base. Using this estimated 6-month change, indications from the June survey are cumulated in terms of percentage of the base January date. Estimates of midyear milk-cow numbers as percentage of the base date are entered in the lower section of the line charts on the basis of indications of change shown by the surveys. To obtain indications of June and December monthly milk cow numbers, percentages of base are applied to the estimated December monthly number of milk cows coinciding with the base date. The 6-month indicated numbers and monthly estimates for earlier years are shown on a second set of line charts (fig. 29). Monthly numbers of milk cows on farms are estimated directly on these charts considering the 6-month indications of trend.

In making estimates of monthly numbers of milk cows subsequent to the last semi-annual survey, the trend shown in the last year or two is projected with allowance for indications of current changes available from monthly samples. Numbers of milk cows per farm obtained from the crop reporters' and dairy reporters' samples are not usually stable enough to provide a reliable indication of the small year-to-
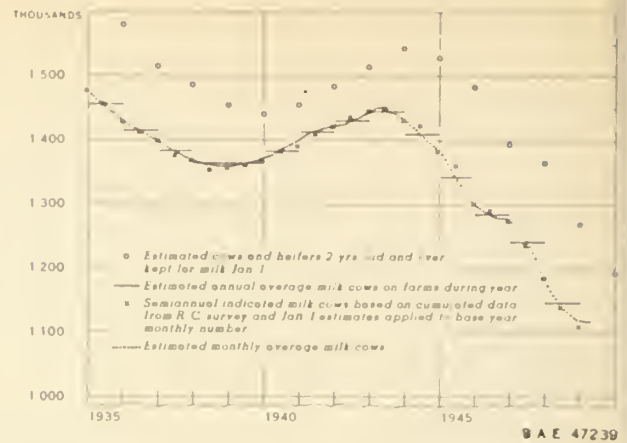
FIGURE 29.—Number of milk cows on farms, Iowa, 1935-49.

year changes taking place in numbers of milk cows. In some States matched samples of the crop reporters' herds for the current month and the same month the previous year are used to provide indications of changes. Experiments with 4-month moving averages of the crop reporters' cows per farm show some promise in helping to project the monthly milk cow numbers.

Annual estimates of number of milk cows on farms during the year are obtained as a straight average of the monthly numbers where available. When monthly estimates are not made currently, annual estimates are based on year-end and midyear indicated numbers of milk cows. January numbers of producing milk cows (excluding heifers not yet fresh) are averaged for the beginning and end of the year and a percentage of the number for the previous year is obtained. Indications of the midyear number of milk cows as percentage of previous year are developed from analysis of the June Rural Carrier Livestock Survey data. The percentage changes shown by year-end and the midyear numbers, are used to establish a tentative percentage of previous year. This percentage is applied to the estimated number of milk cows on farms during the previous year to obtain an indication of the number for the current year. A second indication is obtained from the estimated annual number of milk cows on farms for the last census year and the changes shown by the average January numbers of milk cows excluding heifers not fresh.

On the basis of these two indications, an estimated annual number of milk cow is adopted. This tentative estimate of number of milk cows on farms during the year, as well as the tentative estimate of milk production per cow, is subject to further review in considering indications

and estimates of total production of milk. The estimate finally arrived at represents the figure that, in the statisticians' judgment, best reconciles the available indications from the several sources.

Estimates of milk cow numbers are subject to revision a year later on the basis of information available from assessment data and similar sources. Use of these secondary data for purposes of revision requires careful analysis of the source, methods of assembly, completeness, and comparability of the information, use of correlation charts to adjust for possible bias, and appraisal of indications from secondary sources in relation to indications from the current survey data. The quinquennial review in connection with the census of agriculture permits a more complete appraisal of the country's milk herds, as additional data relative to number of farms with milk cows and more extensive information on cattle numbers, including data by classes, become available. If changes are made in the level of estimates as a result of the 5-year census review, estimates for all intercensal years are subject to revision in line with the best information available as to year-to-year trends.

In estimating numbers of milk cows on farms, numerous problems relative to obtaining accurate and complete information are encountered. A major one is that of defining a milk cow. There are wide differences in types of cows that contribute to the Nation's milk supply. In the central portion of the country much of the milk is produced by dual-purpose or, as they are commonly called, "red cows", which have considerable Shorthorn or Hereford blood and are used both for milking purposes and to produce calves, which are usually sold for meat. Similarly, in the southern part of the country a great many cows of mixed breeding are milked for a part of the year. The question whether such cows should be considered as milk cows must be faced in both enumerating and sampling milk cow numbers.

To minimize difficulties in definition, it has been found necessary to know two things: (a) Number of cows milked, and (b) number of all milk cows in herd, including dry cows. The dual-question approach helps in getting reports on cows of nondairy breeds that produce milk. It also avoids confusion in the farmer's mind as to whether to call a cow a milk cow. Over a period of years, when the relationships between prices of butterfat and beef change sharply, some cows milked in previous years may be used exclusively for raising calves or vice versa. In such cases statistical measurements of changes in milk cow numbers primarily reflect current classification of their cows by farmers.

A wide range in numbers of cows on indi-vidual farms results in relatively large sampling variation of averages per farm. Therefore, the number of farms reporting in the surveys must be large if sufficient stability in the samples to permit estimation of small year-to-year change in milk cow numbers, is to be obtained. It is also difficult to obtain a report from a farmer whose milk or livestock enterprise is only a small part of his farming operations. In practically all samples maintained on a voluntary basis, the average number of milk cows per reporting farm is appreciably larger than that obtained in the census enumeration of all farms. Use of regression charts and identical herd comparisons helps to minimize size of herd biases, but year-to-year change in numbers of milk cows in herds of one, two, or three animals, when these differ from those in larger herds, may not be fully reflected in the samples.

The usefulness of secondary data in estimating milk cow numbers may be affected by the purposes for which the secondary data are obtained, the wording of the questions as compared with the definition of milk cows estimated, and the relative completeness of the secondary information. Much of the assessment data on livestock numbers is incomplete as farmers tend to report a minimum number of cows for taxation purposes. This type of under-reporting may be minimized through use of regression charts, but the question of relative completeness from year to year and of differences in completeness with changes in assessment rates are always difficult to appraise. In addition, many assessments of milk cows tend to obtain only the number of cows of strictly dairy breeding and to omit many of the milk cows of dual-purpose or beef-breeding types which contribute a large part of the total milk produced in some areas.

The census of agriculture taken each 5 years theoretically provides a complete count of the number of milk cows on farms, but in practice, it falls somewhat short of completeness. Wording of census question and the degree of completeness of the various census enumerations must be appraised carefully in judging the trend in numbers of milk cows between two or more census periods.

At 5-year intervals since 1925, the census of agriculture has asked farmers to report the number of cows milked during all or any part of the preceding year. Although there have been some differences in the actual wording of the question, these differences do not appear to have materially affected the results. However, considerable difficulty has been experienced by enumerators in obtaining comparable answers to the question from all farmers. In general, the totals obtained appear to approach an approximate average number on hand during the

previous year. Some farmers tend to report only the number of cows milked at the time of enumeration, a figure which excludes a considerable number of dry milk cows. In other cases the total number of milk cows was included, but the number at the time of the census enumeration had changed from that of the previous year. In certain instances, it appears that a total number of milk cows on hand at any time during the year, including a turn-over of perhaps 10 to 20 percent, has been reported. To solve these problems, the census is now asking for both number of cows milked and all milk cows in the herd at the time of enumeration.

Additional questions on cattle in some of the censuses have been helpful in interpreting enumerated data on milk cow numbers. Both the 1940 and 1945 censuses enumerated all cows and heifers 2 years old and over on farms. In 15 States in which milk cows represented 97 percent of the total cows, the number of all cows 2 years old and over increased 13 percent between 1940 and 1945, whereas the reported number of cows milked the previous year increased only 7 percent. These differences were so large that misinterpretation of one or the other question appeared obvious. A careful review of both series and data from supplementary sources was necessary in gauging the trend in numbers of milk cows.

Appraisal of the census information to eliminate effects of changes in interpretation of questions and of variations in degree of completeness necessary to arrive at a true change in numbers of milk cows over the 5-year period is a sizable problem. Comparisons are usually made for the smallest possible geographic areas for which information can be obtained, and for geographic areas in which similar trends might be expected to take place. Comparisons are also made with assessment data and other information available from secondary sources. Results of these analyses serve to appraise the accuracy and usefulness of the census enumerated totals in determining the trend of milk-cow numbers over the 5 years or more in question.

Production of milk per cow.—The general level of production of milk per cow estimates is established on the basis of both direct indications of amount per cow and of indirect indications calculated from milk utilization, estimated numbers of milk cows. Direct indications of level of production of milk per cow include amounts produced per cow in herds kept by crop reporters, dairy reporters, livestock reporters, herds tested in dairy herd improvement associations, etc., and averages obtained by dividing census-enumerated annual total milk production by number of cows milked during the year. In the indirect approach total

milk-utilization figures are prepared from data showing plant receipts and estimates of farm uses and other data. These totals are divided by the estimated number of milk cows. Estimates of milk production per cow finally adopted represent the combined result of the two approaches. Estimates of milk production per cow, milk cow numbers, and total milk production are interrelated in that the product of the first two equals the total estimate of milk.

Current monthly and annual estimates of milk production per cow are established on the basis of rates of production per cow in herds kept by reporters, considering the relationship of these samples to estimates of milk production per cow as established over a period of years. Current sample data on milk production per cow are obtained on the first of each month from a group of about 20,000 crop reporters. (Form C.E. 2–8766G, Appendix D, items 15-18.) In 14 of the more important dairy States this sample is supplemented by monthly reports from about 2,500 special dairy reporters. Dairy reporters' farms tend to be more specialized toward milk production than do those of crop reporters and usually some milk or cream is sold. In the other 34 States, quarterly reports are obtained from about 5,000 dairy correspondents on February 1, May 1, August 1, and November 1. (C.E. 9–152, Appendix D, items 1-3.) Semi-annual reports on daily milk production per cow are obtained from the 120,-000 livestock reporters mentioned previously. (C.E. 2–8290, Appendix D, items 11-13.)

Questions relating to milk production asked these several groups of reporters include: (a) Number of cows milked yesterday, (b) number of all milk cows yesterday, both dry and in milk, (c) total production of milk yesterday. Production of milk may be reported in either pounds or gallons. Farmers with herds of above average size who sell whole milk usually report in pounds. Those in cream-selling areas or with small herds where milk is used mostly on the farm usually report in gallons. Reports may be listed in the unit reported, but in summarization, averages per cow are converted to a pound basis. A daily average rate of production per cow is computed from these sample totals by dividing the amount of milk produced (c) by the number of all milk cows in herd, including dry cows (b). The average usually obtained from this procedure is a daily figure, but it includes reports scattered over a period of nearly a week centering just ahead of the first of the month.

Current indications of milk production per cow for each month are obtained by averaging the reported daily production per cow in crop correspondents' herds at the beginning and end of the month and converting this average

to a monthly total by multiplying by the number of days in the month. In some months in which the average of the two daily figures obviously does not represent a reasonable daily average for the month, it may be necessary to make an adjustment. This most frequently happens for the peak month of June, when the June 1 sample catches the seasonal curve of milk production on the upgrade while the July 1 report intersects the curve after it has turned downward. Both are thus below the true average daily production in reporters' herds during most of the month. In such a situation, an adjusted average is obtained by projecting the curve of daily production throughout the month and estimating a daily average from this curve. Annual indications of milk production per cow are obtained by totaling the 12 monthly figures. For those States in which monthly estimates are not made, annual indications from reporters' herds are obtained by totaling the daily averages for the 12 months and multiplying by 365/12 or 366/12, depending on the number of days in the particular year.

In preparing monthly estimates of milk production per cow, reporters' indications are interpreted on regression charts. The level of production per cow in reporters' herds is usually higher than the average for all herds, as reporters tend to be better informed on new practices, to have larger than average milking herds, and to maintain more nearly uniform year-around production. The percentage by which production per cow in reporters' herds exceeds that in average herds varies from State to State and month to month, depending on the character of the sample, but usually falls within a range of 5 to 20 percent.

Charts showing annual milk production per cow are prepared from estimates for earlier years and corresponding indications from reporters' herds. Thus, the amount of bias is established primarily by check data from various sources, including the census.

In determining the regression relationship in each month, additional analyses are made on seasonal variation of milk use in order to establish the "true level" of milk production per cow for each month. Annual estimates of milk used in each of the major disposition categories —whole milk sold to plants and dealers, milk skimmed on farms for sale as cream, milk retailed by farmers, milk used for making farm butter, milk consumed by farm households, and milk fed to calves—are distributed between months on the basis of the best check data obtainable. Sales of milk and cream by farmers in many States are prorated on the basis of monthly data on receipts of milk and cream at dairy plants. For cream, plant receipts are converted to a milk-equivalent basis, using varying monthly butterfat tests. When plant records as to receipts of milk and cream are not available, the amounts of dairy products manufactured each month, converted to a milk-equivalent basis and supplemented by estimates of milk sold for fluid use, are used to distribute sales of milk and cream among the various months. Retail sales by farmers tend to be fairly uniform throughout the year and the length of the month appears to be the greatest cause of variation between months except for areas in which vacation trade or other special factors are involved.

A monthly distribution of milk used on the farm is made from sample data obtained from dairy correspondents. Seasonal variation in farm household consumption of milk and cream is due partly to the increased number of people on farms in the summer and partly to somewhat heavier per capita consumption of milk at that time. Reports from special dairy correspondents from each State on February 1 and August 1 provide data for estimating relationships of number of people per farm and rate of per capita consumption at a time near the high and low points for the season. For intervening months a reasonable curve on people per farm is developed by utilizing sample data from crop correspondents available for scattered months, with some attention paid to seasonal changes in farm workers. Intervening months on the seasonal curve of per capita consumption of milk are approximated on the basis of the relative level of milk production in the various months. Monthly variations in milk fed to calves appear to depend mainly upon the number of young calves on hand, and seasonal distribution is based on monthly freshenings with a slight lag.

When each of the separate use items for milk has been prorated by months, the amounts of the several items in each month are added to provide a total monthly milk estimate. Total monthly use of milk is then divided by estimated monthly numbers of milk cows to derive monthly milk per cow. The derived milk per cow averages for a given month are plotted on the Y axis of a regression chart against sample indications from reporters' herds. The regression relationship thus established provides the basis for eliminating bias in the reported data when making the current month's estimate.

Total production of milk and butterfat on farms.—A preliminary estimate of total production of milk on farms is obtained by multiplying independent estimates of number of milk cows on farms and production of milk per cow. This estimate is reviewed in the light of available check data covering a substantial part of farm production of milk. In a number of States,

current data are obtained from dairy manufacturing and processing plants on amount of milk and cream received from farmers. A sample of the questionnaire used in gathering the milk and cream receipts data from manufacturing plants is shown in C.E.9–61, Appendix D, Items A–1 and B–1 of Section I. These data, where monthly, are usually tabulated within 1 to 3 months following the month to which they relate.

In early February the annual estimates of milk production in the preceding year are rechecked. Preliminary data on the receipts of milk and cream at plants are used for this purpose in those States where such figures are collected currently each month. In other States, where data are collected on an annual schedule, data on receipts become available near the middle of the following year and can be utilized only for revisions. When data on milk and cream receipts are not available, an indication of total use of milk is obtained by computing the milk equivalent of manufactured products and combining with estimates of farm uses and approximations of nonfarm fluid consumption. Complete check data from such sources are available for revising the previous year's estimate of production. Preliminary estimates of production of creamery butter, cheese, ice cream, and receipts of milk by condenseries provide, shortly after the end of the year, a check on the volume of manufactured milk.

In some commercial dairy States receipts of milk and cream at dairy plants represent as much as 85 to 95 percent of the total production of milk on farms. When this situation prevails and when data showing plant receipts are currently available, these data are given a great deal of weight in determining the final estimate of milk production. On the other hand, in a number of States the amount of milk and cream handled by commercial manufacturers and processors may be less than a third of the total milk produced. In such cases, data from commercial sources offer only a very incomplete check on the volume of farm production of milk.

If the estimate of total production of milk adopted after consideration of all check information differs from the preliminary estimate obtained by multiplying milk cow numbers by production per cow, the estimates of these two items are reviewed and one or the other is adjusted in line with the total production figure adopted. This preserves the multiplicative relationship between numbers of milk cows and production of milk per cow that is inherent in estimates of total production of milk.

The quantity of butterfat in milk produced is computed from the amount of milk produced and an estimated fat test of the milk. The fat test of milk is based mainly upon data obtained from milk dealers and dairy plants giving the amount of butterfat contained in whole milk purchased by them. Typical questions designed to obtain this information are shown in C.E. 9–61 and C.E. 9–119 in Appendix D. Whenever plant receipts of milk represent a nearly complete total of sales by farmers, the butterfat test computed from them is accepted as typical of milk sold by farmers to plants and dealers in the State. When information from milk plants and dealers is less complete, other information considered includes proportions of milk cows of different breeds, average butterfat content of milk produced by cows tested in Dairy Herd Improvement Associations and official tests of the various dairy breed associations. Some fat test information is also obtained directly from farmers who report for their own herds but, in general, information from this source is more variable and less accurate than that obtained from plant sources.

Using the fat test of milk sold by farmers as a guide, estimates are prepared on the fat test of milk used for other purposes by farmers. Milk skimmed for sale as cream tends to come from smaller herds than those selling whole milk. Frequently these herds have a higher percentage of milk cows of the Channel Island breeds. Thus, the fat test of milk skimmed for sale as cream is usually somewhat higher than is the test of milk sold as whole milk. Tests of milk used for such purposes as farm consumption, farm butter, etc., are based largely on estimates of the test of milk sold to plants in the same general area, and on information concerning breed distribution in herds of various sizes.[12]

Production and sales of farm-churned butter. —Estimates of production and sales of farm-churned butter have been prepared from 1924 to date. Census Bureau enumerations of butter churned on farms in 1924, 1929, 1934, and 1939 and of farm butter sold in 1929 and 1939 have been accepted without modification. It is believed that there is some lack of comparability between the 5- and 10-year census enumerations, but check data from other sources are not sufficient to provide more accurate figures. Intercensal years have been estimated on the basis of data obtained from farm reporters.

In 35 States the principal survey information used in estimating production and sales of farm butter is obtained annually from some 15,000 crop reporters. The wording of the questions asked is shown in items 19 and 20 of C.E. 2–8766G, Appendix D. Reports on annual quan-

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[12] For more extensive information on fat tests of milk and cream, see Wilson, John L., and Casey, Glenn E. Farm production, disposition, and income from milk, 1946-47, Bur. Agr. Econ., 1948. [Processed.]

tities made and sold in the previous calendar year are obtained on the January 1 General Schedule. Indications summarized from the sample included both averages per farm for all reports and percentage changes for identical farms reported in both of the last two years. In the 13 of the more important farm-butter-producing States, information on farm butter is obtained once a month from about 5,000 crop reporters. Reporters are requested to show the quantity of butter churned in the week prior to filling out the report and the amount of that butter which was, or will be, sold. Items 20 and 21 of form C.E. 2–8833, Appendix D, are the questions asked. Data relating to the previous week can be reported more easily and with less memory bias than can annual totals obtained at the end of the year. It is planned to use the monthly reports in estimating production of farm butter on a monthly basis as soon as estimating methods can be developed. Averages of weekly butter churned and sold per farm are summarized from the reports. Annual indications from the weekly reports are obtained by multiplying the total of 12 weeks available during the year by 52/12. A slight adjustment is also made to center the weekly figures on the year.

In preparing estimates of annual production of farm butter, indications of the quantity of butter churned are based on three types of calculations: (a) Percentage change in amount per farm from reporters' herds applied to the previous year's estimate of production, (b) cumulative percentage changes on identical farms applied to production in the last census base-year, and (c) the product of independent estimates of numbers of farms making butter and amount of butter made per farm. Estimates of numbers of farms making butter are based on changes in percentage of reporters making butter, related to the enumerated number in the last census year. The amount churned per farm is estimated from changes in the average amount made per farm by crop correspondents reporting farm butter actually churned as related to the amount per farm in the last Census year. Indications of quantity of farm butter churned obtained by these three calculations are reviewed and an estimate representing the concensus of the indications is adopted. In some Southern States, where from one-fourth to two-fifths of the milk produced is used for churning farm butter, the change in production of milk is also used as an indication of production of farm butter.

Estimates of farm butter sold are based on data supplied by reporters. Three main approaches are made to the indicated quantity sold: (a) An estimated percentage sold as applied to the estimated quantity of the butter churned, (b) a direct indication of sales based on the changes in sales on identical farms applied to the estimated quantity of butter sold the previous year, and (c) an estimated amount sold per farm applied to the estimated number of farms making butter. A sample of the charts used in estimating amount of butter sold per farm from amount made per farm is shown in figure 30. These three indications are considered in adopting an estimate of butter sold.
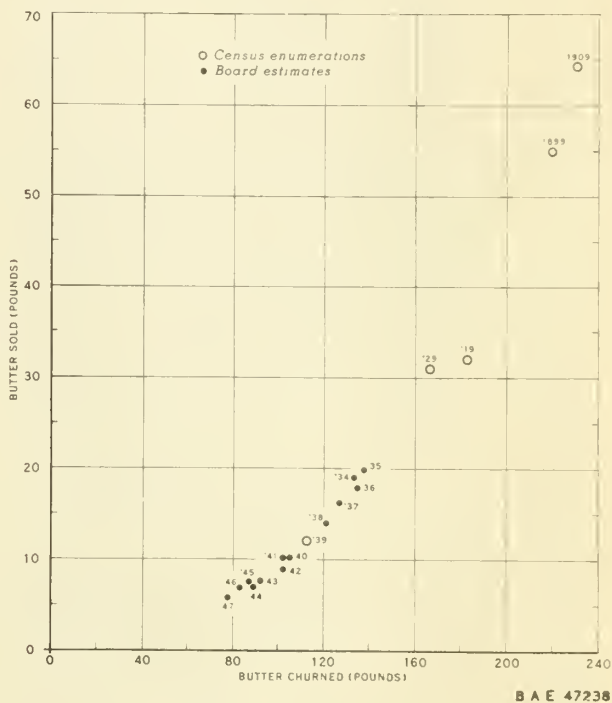
FIGURE 30.—Farm butter made per farm versus farm butter sold per farm, Oklahoma: Census enumerations 1899-1939 and Board estimates 1934-48.

In the handling and processing of sample reports on production of farm butter certain problems arise. Under the farm butter question, farmers may sometimes report the cream they sell which is later used by dairy plants for making creamery butter. This reporting error may sometimes be eliminated by a careful review of reports showing excessive quantities churned. Totals that obviously represent production for a day, week, or month are sometimes entered by the reporter under the annual question. It is necessary to edit schedules rather carefully to keep reporting errors of this kind out of the sample. Because reporters' farms have larger-than-average herds, some nonrepresentativeness also appears in the reporters' data. Most farm butter is produced on farms with small herds, where a considerable part of the milk

produced is for family use. Larger-than-average herds may shift away from production of farm butter and into sale of milk and cream more rapidly than all herds. In the more important farm-butter States, the indication of production of farm butter obtained from a balance sheet distribution of milk production between uses helps to keep estimates in line. To avoid undue domination of sample changes by a few large reports, separate sample totals are obtained for reports of 1,000 pounds or more of butter per year.

Farm disposition and income from milk.—To establish the basic level of estimates of disposition of milk by farmers, balance sheets on milk usage are prepared for the years in which data on production and sales are enumerated by the United States Census Bureau. Individual farm data showing amount of milk used for each purpose are furnished by about 7,000 special dairy reporters twice a year (see question 4, form C.E. 9–152, Appendix D). In a number of States, dairy-plant purchases of milk and cream from farmers are tabulated. Data on quantities of the different manufactured dairy products made in factories also give information as to commercial uses of milk and cream. Estimates of production of farm butter provide indications of milk used for that purpose. Information from these several sources is considered in the establishment of the base level of the milk-disposition figures.

The following items of milk use are estimated separately: (1) Whole milk fed to calves; (2) milk consumed as fluid milk and cream in farm households; (3) milk used for making farm butter (this quantity is subsequently divided between milk in butter consumed by farmers and that in butter sold from farms); (4) milk skimmed for sale as cream to plants and dealers; (5) milk sold as whole milk to plants and dealers; and (6) milk retailed by farmers direct to consumers as fluid milk and cream.

Estimates of milk fed to calves are determined primarily on the basis of the percentage of total milk produced which is fed. In establishing the base level of the estimates, numbers of calves and approximations of volume consumed per calf were also considered. Estimates are carried forward from year to year upon the basis of changes in percentage of milk produced which is fed to calves as reported twice a year by special dairy reporters. Using changes shown by sample averages as a guide, estimates of the annual percentage of milk fed to calves are prepared and applied to the estimated total volume of milk produced, to compute quantity of milk fed.

Estimates of consumption of fluid milk and cream on farms on which milk is produced are based on the number of people on these farms

and on average consumption per capita. In the base census year, the number of people on farms with cows is estimated from the numbers of farms reporting milk cows and from estimates of average population per farm. The latter are based on census data on population per occupied farm, with adjustments to represent annual average conditions. The population estimates are also adjusted downward to allow for people on farms with cows, but without milk a part of the year because all cows were dry. For years subsequent to the last census, the number of people on farms with milk cows is assumed to change in proportion to the total farm population, as estimated by the Bureau of Agricultural Economics.

Sample information relating to consumption of milk per capita by the farm family is obtained from special dairy reporters twice each year. These farmers report the quantity of whole milk used for food or drink, and number of people, including children of all ages, on their farms. Per capita consumption is computed by dividing the milk consumed by the number of people reported. In establishing the base level of estimates of milk consumption per capita, data showing consumption per capita in reporters' herds is analyzed on a size-of-herd basis. In carrying the estimates forward from year to year, changes in per capita consumption in reporters' herds serve as a basis for per capita estimates. Consumption of milk by farm families is obtained as the product of the independent estimates of number of people on farms and average consumption per capita. These estimates of consumption are rechecked in the light of changes in production of milk which have an important bearing on the level of farm consumption in those areas in which there are many one- and two-cow farms and in which consumption of fluid milk on farms is a major use of the milk produced.

The quantity of milk used for making farm-churned butter is computed from estimates of quantity of butter made and the amount of milk required to make a pound of butter. Among the various States the quantity of milk per pound of farm butter ranges from about 19 to 23 pounds, depending on the butterfat test of the milk. Farm butter is assumed to contain about 81 percent butterfat, but losses of fat in skimming and churning are such that about 0.86 pound of fat in the original milk used is required to provide the fat in a pound of farm butter. The amount of milk required per pound of butter in each State is computed by dividing 0.86 by the estimated fat test of milk used for making farm butter.

Basic estimates of milk skimmed for sale as cream are determined from census enumerations of butterfat in cream sold by farmers,

receipts of cream at dairy plants, volume of creamery butter made in factories, and similar data. In computing the volume of milk skimmed to provide the fat in cream sold, consideration is given to the test of milk skimmed in the various States and to losses of fat in skimming and delivery. Percentage losses may be as low as 4 percent in States in which centrifugal separation is the usual method of skimming and in which average volume of milk skimmed per farm is high. On the high side losses may reach 8 or 9 percent in States in which hand-skimming is widely employed and the volume of milk skimmed and cream sold per farm is small. Allowances are also made for the customary practice by cream purchasers of rounding weights downward to the nearest whole pound and fat tests to the nearest half or whole percentage.

From year to year, estimates of milk skimmed for sale as cream are based on changes taking place in disposition of milk as reported by dairy correspondents, on changes in production of creamery butter in predominantly cream areas, and upon changes in receipts of cream at dairy plants when these are available. Milk skimmed for sale as cream on dairy reporters' farms is calculated as a percentage of the total milk produced and as a percentage of the milk represented by products sold. To compute indicated volume skimmed, percentages from the reporters' herds are applied to the estimates of total milk produced and milk available for sale. These indications, along with the milk equivalent of creamery-butter production and the milk equivalent of plant receipts of cream, are used as guides in estimating the volume of milk skimmed for sale as cream.

The volume of whole milk sold by farmers to plants and dealers is determined on the basis of an analysis of census enumerations of all whole milk sold by farmers with approximate deductions for retail sales, information on milk receipts at dairy plants, and milk equivalents of manufactured products made from whole milk plus approximations of nonfarm consumption of fluid milk and cream. From year to year the estimates are carried forward on the basis of changes in disposition of milk from dairy reporters' herds, volume of milk reported received by dairy plants, and milk equivalents of whole-milk manufactured products such as cheese, evaporated milk, and dry whole milk, together with available information on consumption of fluid milk and cream by the nonfarm population.

Estimates of milk retailed by farmers were originally determined (about 1930) primarily on the basis of the volume of milk and cream consumed in cities and towns of less than 10,000 people, which at that time were served largely by producer-distributors. Supplementary information included volume of producer-distributor milk in larger cities and data from dairy reporters as to the relative volume of milk retailed. For determining year-to-year changes, information is obtained from dairy reporters to serve as an indication of the general direction of changes.

At periodic intervals information as to the volume of fluid milk and cream sold by farmers and producer-distributors is obtained from city health officers in places of less than 25,000 people. A copy of the schedule used, C.E. 9–128, is shown in Appendix D. These data are analyzed by size of city and estimates are made of the percentage of total fluid consumption retailed by producers. Indications of volume of milk sold by farmers are obtained by applying these percentages to approximate quantities of fluid milk consumed in towns and cities of various sizes. These totals are used for checking State and national estimates of retail sales. Because small and medium-sized cities apply stricter sanitation standards to their fluid milk supply and States require pasteurization of fluid milk and cream, less milk and cream has been retailed by farmers in recent years. Dealers in larger cities have extended their routes to cover smaller towns and villages. It is believed that present methods of estimating milk and cream retailed by farmers should be improved, and consideration has been given to the use of an interview survey in a sample of small and medium-sized towns to determine the volume of milk and cream retailed by farmers.

To obtain estimates of cash receipts from farm marketings of milk and milk products, estimated quantities sold are multiplied by average prices per unit received by farmers. Computations are made for the four principal types of farm-milk products that have specific market channels and distinctive price series: (1) Farm-churned butter, (2) cream sold to dairy plants, (3) whole milk sold to plants and dealers, and (4) milk and cream retailed by farmers. Methods of estimating quantity of milk sold have already been discussed under disposition of milk. The quantity of butterfat in the cream sold is computed from the volume of milk skimmed for sale as cream, multiplied by estimated quantity of butterfat sold per 100 pounds of milk skimmed. The amount of fat in cream for which farmers receive payment is somewhat less than the amount of fat present in the original milk skimmed, as losses of fat occur in the skimming and delivery. Estimated quantities of fat sold per 100 pounds of milk skimmed in various States range from 3.52 to 4.33 pounds depending on tests of milk skimmed and losses in skimming and delivery.

Retail sales of milk and cream by farmers, as

estimated in pounds of milk under disposition, are converted to quarts by dividing by 2.15. Since no data as to prices of cream sold by farmers are readily available, no attempt is made to segregate the milk equivalent of retail cream which constitutes probably 12 to 15 percent of the total. Sales of farm butter are estimated as outlined in a previous section. Methods of estimating prices received by farmers are discussed in chapter 15.

Cash receipts from farm marketings of milk and milk products are computed by multiplying the estimated volume of each of the four items sold by the average price received by farmers, and combining the resulting products. In each State, the value of dairy products consumed on farms where produced is computed by adding together the milk represented by milk, cream, and farm butter consumed by farm families and multiplying this quantity by the average returns per 100 pounds of milk in products sold. The latter figure is obtained by combining cash receipts from sales of farm butter, cream and milk to plants, and milk and cream at retail and dividing by the total volume of milk required to produce the four products. Gross farm income from milk is obtained by adding together cash receipts from sales and value of products consumed on farms where produced.

Rations fed to milk cows.—Statistical data on rations fed to milk cows include a number of separate series such as amount of grain and concentrates fed, composition of the concentrate ration, value per 100 pounds of concentrate rations fed, amount of hay, silage, and other roughage fed, kinds and value of hay fed to milk cows and condition of pasture feed.[13] Crop reporters and dairy reporters supply the individual farm data on which the series are based. Questions asked include item 19 of C.E. 2–8833 and items 4-8 of C.E. 2–8454, Appendix D.

Data relating to amount of grain and concentrates fed to milk cows are collected from crop reporters at bimonthly intervals, from dairy reporters in 14 States at monthly intervals, and from dairy reporters in the other 34 States at quarterly intervals. An average quantity of grain fed per cow is computed for the herds reporting, and these series are published regularly as indicative of feeding levels in this type of herd. The amount fed per cow as reported is higher than the average for all farms. In estimating State and national averages of grain and other concentrates fed per cow, the rate of feeding in average herds is assumed to bear the same relationship to that in

reporters' herds as milk production per cow in average herds does to that in reporters' herds. Estimates of amount of grain fed per 100 pounds of milk are prepared and these are converted to estimates of grain fed per cow and total quantity of grain fed by multiplying by estimated average production of milk per cow and total production of milk, respectively. As the sample averages tend to represent farms selling milk or cream, separate estimates are made for rates of feeding in commercial herds and noncommercial herds. In estimating annual quantities of grain fed per 100 pounds of milk in commercial herds, average rates of feeding are computed for crop reporters' and dairy reporters' herds and estimates are made from regression charts (figure 31). In making esti-
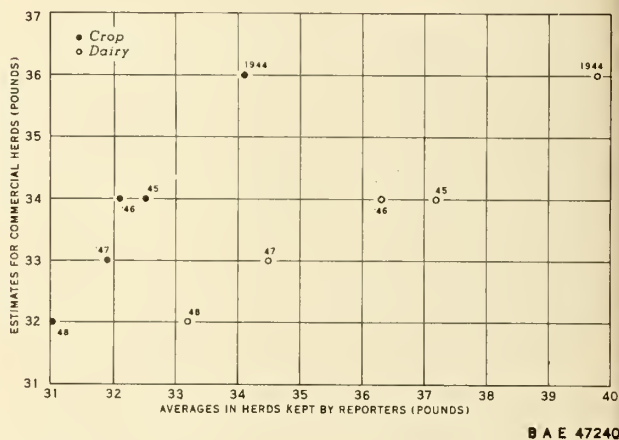
FIGURE 31.—Grain and concentrates fed per 100 pounds of milk produced, Ohio, 1944-48: Averages in herds kept by crop reporters and dairy reporters vs. estimates for commercial herds.

mates for the noncommercial herds, more reliance is placed upon data for crop reporters' herds which are more typical of average farm conditions.

Considerable information relating to kinds of feed used in the concentrate ration is obtained from dairy reporters (Item 5, C.E. 2–8454, Appendix D). Quantities of each feed reported fed on individual farms are combined to obtain State totals. Percentages of the total ration are computed for each of the home-grown and purchased feed items. Data are obtained twice a year—May 1 and November 1. An average of the two dates is published, and in most cases it appears fairly representative of yearly average feeding practices in commercial herds.

Estimates of the value per 100 pounds of concentrate rations fed to milk cows are prepared to provide a feed-cost figure for computing milk-feed and butterfat-feed price ratios. Sam-

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[13] Examples of the published series may be found in: Wilson, John L., and Taylor, Frank M. Rations fed to milk cows 1948, 1949. [Processed.]

ple data are obtained from special dairy re- porters (see question 6, C.E. 2–8454, Appendix D) at quarterly intervals (monthly in several States). Reporters are asked to estimate the value per 100 pounds of the ration actually fed, including purchased feeds valued at prices paid and home-grown feeds valued at prices obtain- able at local markets. Averages obtained give each report equal weight. This tends to reduce the influence of large herds which are over rep- resented in the sample. Averages for reporters' herds are plotted on line charts, together with monthly computed values of fixed quantities of a group of common feeds. Estimates of value per 100 pounds are made by entering dots on the line chart, using the quarterly reported data for establishing levels of value and the com- puted value of the fixed-feed mixture as a basis for month-to-month changes. Monthly estimates are prepared for each of six major regions cur- rently, and for individual States at the end of each year. Regional data are combined to ob- tain national averages for milk-selling areas, cream-selling areas, and all areas. Weights used are estimates of quantities of concentrate ra- tion fed for producing milk sold to plants and for producing milk skimmed for sale as cream.[14]

Data relating to the amount of hay, silage, and other roughage fed to milk cows during the winter feeding season are obtained from special dairy reporters once a year on May 1. Questions used are shown on C.E. 2–8454, Appendix D. Information obtained includes a total of the major kinds of hay fed during the October to May feeding season, along with the quantity of silage and other roughage. Average amounts per cow are computed on the basis of the num- ber of cows on reporters' farms at the time the questionnaire was filled out. Percentages of the total represented by each kind of hay are com- puted from the totals for reporters' herds. In- formation as to the value per ton of hay fed to milk cows is obtained from dairy reporters on the February 1 schedule (question 9, C.E. 9–152, Appendix D). Averages per ton are com- puted from the reported data in each State and these are combined to a national average, weighting by estimated tonnages of hay fed to milk cows.

Data obtained from crop reporters on con- dition of pastures as percentage of normal pro- vide a rough measure of the quantity of feed available in pastures. Reports on condition of pastures are obtained as of the first of each month from April through November. Wording of the question asked is shown in item 3 of C.E. 2–8833, Appendix D. Average condition

for individual States is obtained by combining reported data usually weighted by crop-report- ing districts. National average condition of pas- tures for all types of livestock is obtained by combining individual State averages on the basis of weights representing pasture land, livestock units, and related items. A separate national average condition of dairy pastures is computed by combining the State conditions fig- ures in accord with the importance of dairy pro- duction in each State.

A further use of pasture condition reports is in the preparation of maps showing variation in pasture conditions over the country. For this purpose, county average condition is com- puted for each of the 3,070 counties in the United States for which reported data are avail- able. A map is prepared in which county condi- tions of pastures are outlined on a graduated scale of coloring to contrast good and poor pasture condition. The following graduations in percentages of normal are used:

Condition, percentage of normal	Description
80 percent and over	good to excellent
65 to 80 percent	poor to fair
50 to 65 percent	very poor
35 to 50 percent	severe drought
Under 35 percent	extreme drought

On the map showing county condition, more general contour lines are drawn in to show graduation of pasture condition without re- gard to county boundaries. Although condition in individual counties may vary considerably due to local conditions, grouping the counties in broader areas of good and poor pasture condi- tion tends to show up general conditions rather clearly. Usually, at least 3 or 4 counties of similar conditions are required before a sepa- rate area is outlined.

From this map outlining the general areas of pasture conditions, an isopleth map is pre- pared showing areas in black and white shading of varying intensity. This map is photographed and duplicated by multilith procedure. A sam- ple of such a pasture map is shown in figure 32. The pasture map thus produced provides a very good outline of not only pasture condition, but also of general crop growth and weather condi- tion, as dry areas are clearly defined as com- pared with those areas in which soil moisture is more plentiful. Considerable use is made of these pasture maps as indications of general crop conditions.

MANUFACTURED DAIRY PRODUCTS

Data concerning manufactured dairy prod- ucts such as butter, cheese, and evaporated milk, are prepared from information supplied

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[14] For more detailed discussion of methods see Wil- son, John L. Rations fed to milk cows, Bur. Agr. Econ., 1945. [Processed.]
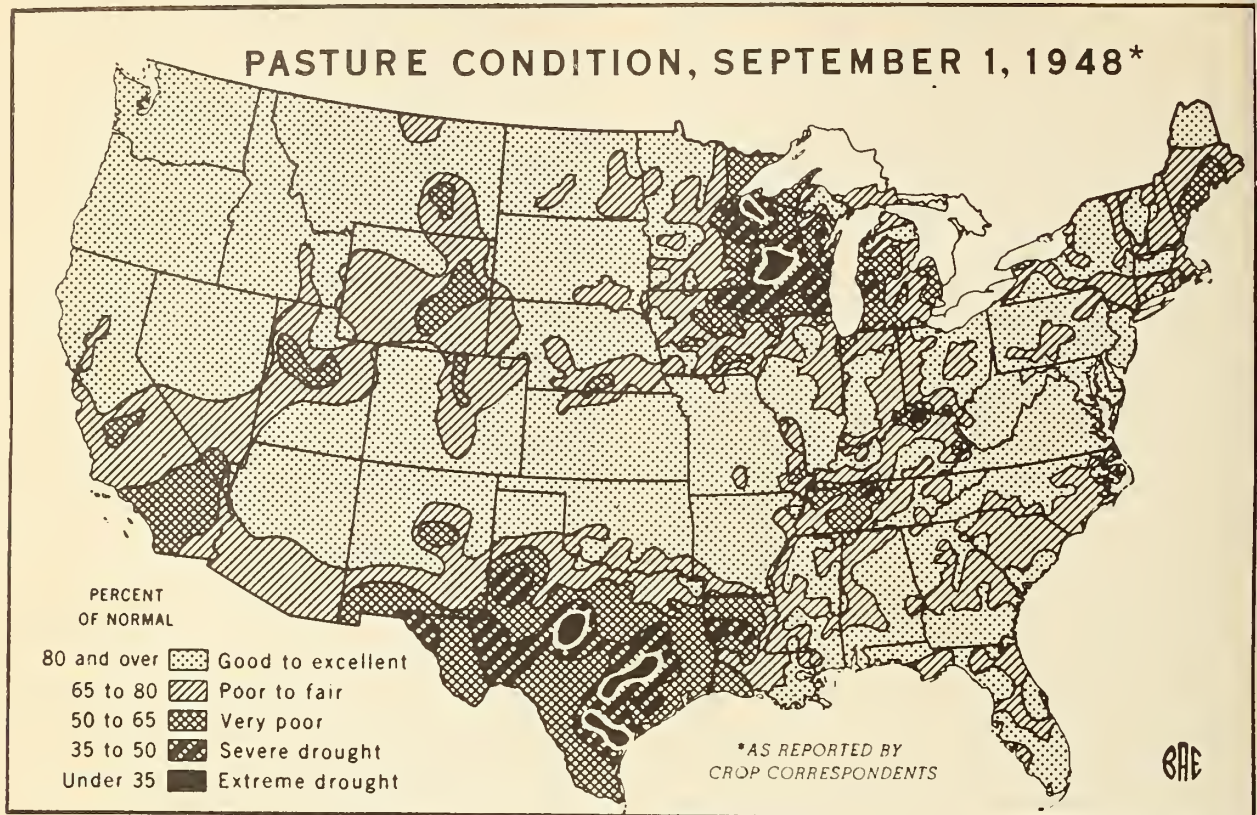
FIGURE 32.—Pasture condition, September 1, 1948.

by primary dairy processing plants. Approximately 23,000 plants manufacture dairy products in the United States. Of this number about 11,000 produce for wholesale distribution and another 12,000 make ice cream, mostly from purchased mix, for retail distribution. Statistics relating to manufactured dairy products include quantities produced, and manufacturers' prices, stocks, and sales. These statistics are used by manufacturers, distributors, consumers, machinery companies, Government agencies, and others who wish to keep in touch with production trends and areas, market supplies, prices of products, utilization of milk, and other economic aspects of the dairy industry.

A practically complete enumeration of production of some 40 principal dairy products is obtained each year. As with most complete enumerations, an appreciable time lag is involved in the collection and publication of the statistics. To provide data for those who wish to keep in touch with the current situation, estimates of production of the more important manufactured products are prepared at weekly or monthly intervals. As the enumerated data provide the foundation for current estimates of production, this phase is discussed first.

Enumeration of production of factory dairy products.—In enumeration of dairy-plant production, data are obtained for all the more important manufactured dairy products such as creamery butter, a number of different kinds of cheese, various types of evaporated and condensed milk products, several kinds of dry milk products, and ice cream, sherbet, and other frozen dairy foods. Items covered are shown in detail on Form C.E. 9–33, Appendix D. Data are obtained from the plants on a monthly basis, although the schedules may be collected at annual, quarterly, or monthly intervals.

A complete list of all dairy plants which produce any manufactured products is the first requirement in obtaining the enumerated data, and such a list is maintained by Agricultural Estimates. Each plant is assigned a code number for identification purposes. A typical code number—34–0042–77—identifies the plant as follows:

34—Ohio (State)
0042—Sumner Creamery, Akron, Ohio
    (Individual plant identification)
77—Summit (County)

Once a plant is assigned a particular code number, it keeps that number regardless of any changes in ownership that may take place. A card file is kept of all active plants. The cards show names, addresses, and principal products made by plants. When a plant becomes inactive the record card is transferred to an "out of business" file. In maintaining a complete list, records of dairy plants licensed under State laws, when available, are helpful. Dairy magazines and periodicals are also carefully reviewed to obtain names of new plants going into operation.

Collection of the schedules from the individual plants is handled partly through the State offices and partly through the Division of Dairy Statistics in Washington, D. C. In 28 States, cooperative agreements with the State departments of agriculture or similar State agencies permit Federal and State efforts to be combined through the use of a joint schedule. In most of the States in which these agreements are in effect, State laws provide for collection of the statistics as a part of the State dairy-plant licensing system. Such laws are helpful in obtaining complete returns. In cooperating States the Federal-State statistician may handle the collection and tabulation of dairy-plant statistics directly or he may assist other State officials. For 20 States and the District of Columbia, dairy-plant data are collected by schedules mailed direct from the Division of Dairy Statistics in Washington, D. C. In all cases, the collecting agency, whether State office or the Washington, D. C. office, maintains a master list of all dairy plants. In most cases the schedules are mailed to plants in window envelopes and the name and address of the plant is stamped directly on the schedule. This is helpful in identifying the returned reports, as the operator who fills out the schedule may not always fully identify the plant. Constant diligence and numerous follow-ups are necessary to obtain a complete coverage of all dairy manufacturing plants.

A typical collection procedure is that of the Wisconsin office, which uses an annual schedule with spaces provided for reporting monthly totals. (See Schedule Budget Bureau N. 40–R019.3, Appendix D.) Shortly after the end of the year the schedules are addressed and mailed to each dairy plant in the State. When the completed schedule is returned to the office it is checked against a plant record card showing kind and volume of products made in previous years to determine whether the schedule has

been completely and accurately filled out. If the schedule seems satisfactory, the addressograph plate for that plant is transferred to a parallel drawer, leaving in the active plate file only those for plants from which schedules have not been received. A few weeks later a reminder card is addressed to each of the delinquent plants, calling to the operator's attention that the manufactured-dairy-products questionnaire sent earlier has not been returned. A few weeks later a second reminder card is sent to plants that are still delinquent. The next follow-up is usually in the form of another schedule prominently marked "Second request", or a letter requesting their cooperation by returning the schedule. After such a program, reports usually will have been received from all but perhaps 25 or 30 out of more than 2,500 plants in the State. Then, usually, registered letters or telegrams are sent as a final reminder.

As Wisconsin has a State law which requires the reporting of dairy statistics, the names of the few plants which have not submitted reports are given to the State dairy inspectors. During regular inspections of the plants these men call the operator's attention to the statistics inquiry and usually obtain a completed report on the quantities of products made without further difficulty. Occasionally, however, court action is necessary.

When State laws are not available to assist in the collection of these statistics, it is sometimes possible to obtain delinquent reports by telephoning the plant manager or in some cases through personal visit of a representative of the State office. In a very few cases, the plant operator may refuse to report after all possible persuasion has been used. In such cases, if it can be determined that the plant actually operated during the year, an estimate is made of the volume of products manufactured based on reports for other years and other general information.

Sometimes it is difficult to obtain a complete and accurate report from the plant. If a plant makes a large quantity of butter in one year and reports none the next, a letter is usually sent to the plant operator requesting verification. Frequently, a plant operator does not fully understand the questions asked on the schedule and may report amounts that are obviously wrong. Examples include reporting of ice cream in terms of pounds rather than gallons, misplacing a decimal point or showing the wrong number of ciphers. Frequently, errors of these types are detected by comparison of the current schedule with the one submitted for the previous year and necessary corrections are made.

Tabulations of the data relating to production of manufactured dairy products are made

on a commodity basis. For example, a listing sheet is set up for butter with columns for each month and a yearly total. In the stub is recorded the name or code number of the dairy plant or both. Within the State the data are usually arranged in order by crop-reporting districts and counties. After the reports for all plants in the State have been entered on the listing sheet, the data are carefully rechecked by visual inspection to be sure the figures are reasonable and consistent with reports in other years. Totals are then computed and entered on the listing sheets.

After the State tabulations have been completed, a summary is sent to Washington where all States are combined into a report showing national, regional, and State totals.[15] For the more important products separate tables show quantities of the products made, by months, in each State. Also shown are the number of plants making the particular product. In publication of data, care is taken not to divulge the operations of any single individual plant.

Some special considerations are involved in enumeration of the 12,000 establishments that make ice cream mostly from purchased mix for retail distribution. These are generally referred to as "counter freezers" as most of them originally froze their ice cream in a batch-type freezer mounted on the counter. Enumeration of the counter freezers is generally handled through an annual schedule. (Form C.E. 9–111, Appendix D.) As counter freezers are generally small establishments with little equipment, are easily moved, and are businesses that are often highly seasonal, it is frequently difficult to find the owners. In many States, from 10 to 25 percent may not report. Production for the total group is therefore obtained on the basis of totals for reporting plants and an estimate for nonreporting plants believed to be in operation. The latter is based on numbers of plants listed or licensed, but not reporting, indications of the proportion out of business or not producing in the current year, and estimates of amount made per plant by the nonreporters. Only annual production of counter freezers is enumerated. Monthly totals are obtained by prorating the yearly total between months according to the seasonal pattern shown by production of the regular plants during the same year. Usually the production of this group represents an extremely small percentage of the total output of ice cream for a State.

Current estimates of production of manufactured dairy products.—To serve the need for current data on production of factory dairy products, estimates of monthly or weekly production of important products are prepared. Estimates of current production of butter, cheese, and ice cream are handled in the Chicago, Illinois, Dairy Statistics Office and for evaporated, condensed, and dry-milk production, casein and milk sugar, in the Division of Dairy Statistics in the Washington, D. C., office. The special dairy statistics office was established in Chicago, the center of the dairy belt, primarily to facilitate mailing and mechanical operations in preparation of weekly estimates on butter and cheese which require prompt handling. The Oregon field office also assembles information on weekly butter and cheese in 11 Western States, and forwards it to Chicago for integration with data for other States before publication of national and regional totals.

Weekly production estimates of butter and American cheese.—Sample data on weekly production of butter and American cheese are obtained by means of a card schedule (form CEX–244, Appendix D) mailed to about 700 butter manufacturing plants and 500 cheese factories. A number of these plants produce both butter and American cheese. Two questions are asked about current production in the week ending Thursday: (1) The number of pounds of butter made and (2) the number of pounds of milk used in making American cheese. Almost 90 percent of the cards are returned by the butter plants and about 85 percent by the cheese plants.

In the original selection of the sample, it was attempted to obtain a group of plants as representative as possible of the total production of the country. Plants in different size groups were chosen, which were distributed as evenly as possible throughout the production areas. The butter sample constitutes some 40 to 45 percent of the total production of the country and the American cheese sample, about 35 percent. The fact that the butter sample contains little more than 20 percent of the total number of plants in the United States and the American cheese sample only about 25 percent shows that more cooperation is received from the larger plants. Optimum sample distributions, however, would suggest almost a complete enumeration of large plants (see chapter 5, discussion of ice cream sampling), so the preponderance of large plants in the sample appears desirable. In some of the more important States, reporting plants have been stratified into large and small classes.

Returned schedules are sorted by States and reported quantities are tabulated on State listing sheets. In a few of the major producing States, data are listed by crop-reporting districts or combinations of them. After inspec-

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[15] Data for 1947 are included in: Bormuth, W. D. Production of manufactured dairy products, 1947. Bur. Agr. Econ., 1948. [Processed.]

tion for obvious errors, totals are obtained. Ratios to the previous week's quantities are computed by matching schedules with those received the previous week. A few adjustments in the currently reported data may be made when an individual plant reports a large change in production from the previous week and the change appears not to be fully typical of the probable trend of production in the State. Production is estimated at this time for some plants which have failed to report, ordinarily by projecting their totals for the preceding week in line with the average rate of seasonal change shown by the reporting plants, and these estimated schedules are included in the matched sample. Weekly changes indicated for the various States are combined into weighted averages for the various geographic areas and for the United States as a whole. These are used for comparisons with the quantitative estimates.

Estimates of quantitative production for each State are then made by means of identical comparisons between the week's production of the sample plants and their production in a previous base period. The base used has been a 3-month moving average of production of the plants in the previous year, reduced to a weekly average. As a result of recent experiments, it appears that a more satisfactory base would be a 12-month average for the last enumerated calendar year. The weekly average of the total production of the State during the base period is multiplied by this identical ratio to obtain the estimate of the current week's production. Estimates for the respective States are added together into area totals and then into a total for the United States. Ratios of change are then computed by comparing this week's production with estimated production of the previous week, the corresponding week a year ago, and the 5-year average for the week.

The original weekly estimates are revised subsequently when fuller information is obtained. Before the time for the next week's calculations, a revision is made for the late reports received. After the monthly estimate based on additional plant reports is prepared, weekly estimates may be adjusted toward the monthly totals if there is much discrepancy between the weekly and monthly totals. Such adjustments are applied to the current weekly sample indications until the time of another monthly estimate. Weekly estimates of the previous year are adjusted to the latest comparable monthly total available.

The estimates of weekly production of American cheese are prepared in a similar way, except for some modifications which are necessary because quantity of milk used for cheese is reported instead of cheese produced. The identical ratios with the previous week are made from the reported quantities of milk. Comparisons with the base period, however, require conversion of the milk to an equivalent weight of cheese. This is accomplished with the aid of yield factors (cheese per 100 pounds of milk) which are derived from plant reports on milk received and cheese made. The differences in yield between the various months were divided between the weeks to make a gradual seasonal change in the yield factors of the successive weeks.

Weekly estimates of production of butter for the 7-day period ending each Thursday are released on the following Tuesday and those for cheese on Wednesday. Published reports include estimates of national production in quantitative terms and regional figures on percentage change from the same week the previous year and from average production for the week in the preceding 5-year period. Comparison of monthly totals of the weekly estimates with the subsequent complete plant enumerations shows that the national weekly estimates of butter and cheese did not differ from the enumeration by more than 5 percent during the period 1944-47. The usual range of error is within 2 percent, and only rarely does the margin exceed 3 percent.

Weekly American cheese warehouse statistics.—Information is obtained from all Wisconsin cheese warehouses and from the major cheese assemblers outside Wisconsin relating to cheese receipts, by styles, and stocks held. Two schedules (forms CEX 309 and CEX 309A, Appendix D) are used to obtain the data on receipts of American cheese. Additional data as to stocks are obtained (forms CEX 305 and CEX 306, Appendix D). The Wisconsin data represent a complete enumeration. Outside Wisconsin, the sample accounts for 50 to 60 percent of the total receipts. Estimates are made for delinquent reporters, but only totals for plants normally reporting are released with no attempt to estimate the national total. Data showing assembler's receipts give the only information available as to current production of American cheese, by styles, and the stocks data provide information on current trading and weekly cold storage stocks of cheese. Wisconsin's apparent trade output of cheese is computed by adding receipts during the week to stocks on hand at the end of the previous week and subtracting stocks on hand at the end of the current week.

Monthly estimates of manufactured dairy products.—Monthly estimates of manufactured products include estimates of production of butter, cheese by types, ice cream, several kinds of evaporated, condensed, and dry milk production, dry casein, and milk sugar. In table 4 are

shown identification numbers of the inquiries used (see Appendix D), the sample coverage and detail of the various monthly estimates prepared. Additional related data on central market wholesale prices of butter and cheese, and on cold-storage holdings of dairy products, which are discussed in chapters 22 and 23, are compiled by the Production and Marketing Administration of the Department.

For making monthly estimates of production of butter and cheese, reports from a sample of dairy plants are obtained on form C.E. 9–119. (See Appendix D.) At the beginning of 1948, about 35 percent of all creameries and 65 percent of the cheese factories were on the mailing list to receive the inquiry. About 90 percent of the creameries on the mailing list report fairly regularly whereas only 50 percent of the cheese factories on the list report regularly. Ice cream reports are obtained from plants partly on C.E. 9–119 and partly on a special ice cream card schedule CEX 320. (See Appendix D.) Schedules are collected from more than 700 plants, representing about two-fifths of the total production. Data relating to production of evaporated, condensed, and dry milk products are obtained from firms or companies rather than from individual plants. Data on sales and stocks, which are on the same schedule with production, are often handled by a firm for a group of individual plants and can be reported only for a combination of plants. The monthly sample on canned evaporated milk and condensed milk, although obtained from only about 50 firms, represents almost a complete enumeration of production. For the more important dry-milk products, some 80 to 95 percent of the total production is covered by the monthly sample. Percentages of total production obtained in the sample for individual items are shown in table 4.

Methods of preparing the estimates differ slightly for the commodity estimated but, in general, indications of changes are obtained as follows: (a) By summarizing identical plants reporting in the previous month and in the current month, a ratio is obtained which, when applied to the previous month's estimated total production, gives the indicated production for the current month, (b) by summarizing identical plants reporting both in the current month and in the same month a year earlier, a ratio between the production of the two months is obtained and applied to the estimated or enumerated total production in the corresponding month a year earlier to secure an indicated current monthly production, (c) for butter and American cheese, a third indication is obtained from weekly production data, which are available only for these products.

With these indications, the statistician makes his estimates, giving proper consideration to size of the sample and usual reliability of each indication. Charts are used to give him some basis for eliminating the bias as indicated by the historic relationship.

Preliminary monthly estimates are released some time between the 20th and 30th of the month following the month to which they relate, depending upon the commodity involved. A month later, when a number of delinquent reports have been received, a revised estimate may be made on the basis of any change in the year-to-year indication shown by all reports, including those not available the previous month. Enumerations of all dairy manufacturers are released the latter part of each year following the year being enumerated. Thus, for about the first half to three-quarters of each year, the year-to-year indication has as a base a monthly estimate rather than the enumeration. When enumerated monthly data for the previous year become available, the base used for the monthly estimates in the early part of the current year may be changed. If so, a revised series of estimates, using the latest base data, are prepared and published as a supplement to the next monthly release. Ordinarily, these revisions are not large.

Manufacturers' prices, stocks, and sales of condensed and dry milk products.—To supply the dairy industry with current information as to prices, stocks, and sales of dairy products, this type of information is obtained from condenseries and milk-drying plants. Data are obtained on questionnaires C.E. 9–103 and C.E. 9–140. (See Appendix D.) The different products covered and the various items obtained on each are shown in table 4. As sales, prices, and stocks of manufactured products are frequently handled on a company basis representing the output of a number of individual manufacturing plants, data are obtained from companies or firms rather than from individual plants. One report may cover the output of a large number of individual manufacturing plants, or it may represent a single plant if under separate ownership. Data on selling prices usually represent prices received f.o.b. plant or at manufacturers' distributing points for a product shipped during the month. The stocks represent all stocks in possession of the manufacturer at the end of the month, whether manufactured by him or others, and whether stored in his main or branch plants, or in his possession in storage or transit (unsold), and regardless of contracts of sale for later delivery. Sales of dairy products are generally defined as shipments from the dairy-manufacturing plants during the month.

Examination, listing, and summarization of sales, prices, and stocks are similarly handled.

TABLE 4.—*Inquiry used, sample obtained, and detail of monthly estimates of production of manufactured dairy products, manufacturers' sales and selling prices, and stocks, prepared by the Division of Dairy Statistics, Agricultural Estimates, BAE*

Commodity	Inquiry used to obtain data	Sample[1] Number of plants	Sample[1] Percentage of production	Production	Detail of estimates Manufacturers' sales and selling prices	Manufacturers' stocks, end of month
Creamery butter	CE9-119	1,240	54	36 States, regions, U.S.	...	...
Cheese:						
American	CE9-119	763	46	23 States, regions, U.S.	...	...
Cheddar	CE9-119	...	...	U.S.	...	...
Other American	CE9-119	95	36	U.S.	...	...
Swiss	CE9-119	57	27	U.S.	...	...
Brick	CE9-119	35	33	U.S.	...	...
Munster	CE9-119	32	65	U.S.	...	...
Limburger	CE9-119	22	60	U.S.	...	...
Cream and Neufchatel	CE9-119	68	31	U.S.	...	...
Italian	CE9-119	14	49	U.S.	...	...
Blue Mold	CE9-119	44	14	U.S.	...	...
Other	CE9-119	736	39	U.S.	...	...
Ice cream	CE9-119 and CEX 320	380	60	31 States and U.S.	...	...
Sherbet	CE9-119 and CEX 320	*Number of firms*		U.S.	...	...
Evaporated Milk	CE9-103	47	98	U.S.	Regional and U.S. prices	Manufacturers', U.S.
Condensed milk, case	CE9-103	8	93	U.S.	Regional and U.S. prices	Manufacturers', U.S.
Bulk condensed milk:						
Unsweetened:						
whole	CE9-103	52	61	U.S.	Regional and U.S. prices	Manufacturers', U.S.
skim	CE9-103	146	55	U.S.	Regional and U.S. prices	Manufacturers', U.S.
Sweetened:						
whole	CE9-103	36	44	U.S.	Regional and U.S. prices	Manufacturers', U.S.
skim	CE9-103	124	63	U.S.	Regional and U.S. prices	Manufacturers', U.S.
Dry whole milk: spray roller	CE9-140 / CE9-140	69	83	U.S.	U.S. sales and prices by size of package	Manufacturers', U.S.
Nonfat dry milk solids:						
Spray process	CE9-140	113	95	U.S.	U.S. sales by price level and average prices	Manufacturers', U.S.
Roller process	CE9-140	245	88	U.S.	U.S. sales by price level and average prices	Manufacturers', U.S.
Dry skim milk (animal feed)	CE9-140	181	83	U.S.	U.S. sales by price level and average prices	Manufacturers', U.S.
Dry buttermilk:						
Human food	CE9-140	202	79	U.S.	U.S. by price level, average prices	Manufacturers', U.S.
Animal feed	CE9-140				U.S. by price level, average prices	
Dry casein	[2]	33	74	U.S.	...	Manufacturers', U.S.
Milk sugar	[3]	8	100	U.S. crude and refined, technical, and U.S.P.	...	Manufacturers', U.S. crude, technical, refined, and U.S.P.

[1] Butter, cheese, ice cream and sherbet based on June 1947, other products 1947 monthly average.
[2] Monthly Dry Casein Schedule.
[3] Monthly Milk Sugar Report.

Sales and price data published represent only totals for the reporting firms. No attempt is made to estimate for missing reports or incomplete coverage of the sample. However, as data are obtained from a large percentage of the universe, reported totals or averages make useful statistical series. For stocks, estimates are made for missing reports normally included in the sample, but no attempt is made to expand the sample to an over-all total.

A special summary is prepared of monthly averages of prices (f.o.b. factory) received by manufacturers for carload lots of nonfat dry milk solids (for human consumption) sold from factories in the States of Indiana, Illinois, Michigan, Wisconsin, and Minnesota. These average prices are used by Milk Market Administrators in formulas for determining the prices to be paid producers for milk. The information is obtained on a special "Dried Skim Milk Report" questionnaire which covers sales from the 26th of one month through the 25th of the next. This period is used instead of a calendar month to allow time for preparation of the averages and their release by no later than the third of the month following the end of the period. All drying plants in the area are on the mailing list to receive the questionnaire, but only about half respond. Average prices are computed for both spray and roller process products. The data are edited and all items that obviously represent less than "carlot" sales (about 40,000 pounds), and any prices which appear erroneous are deleted. Sales and prices are listed according to whether the sales were made to (a) Government agencies, (b) wholesalers, (c) direct users, and (d) others. Prices reported by individual factories are weighted by individual sales during the month to give a weighted average price for spray and roller process separately.

Prices paid by dairy plants for milk for manufacturing purposes.—Average monthly prices paid by dairy manufacturing plants for milk used for cheese, for butter and byproducts, and for canned condensed and evaporated milk, are obtained from data supplied by cheese factories, creameries, and condenseries. Data showing prices paid for milk for cheese and for butter and byproducts are collected on form C.E. 9–119, Appendix D, and the data on milk for canning on form C.E. 9–103, Appendix D. Information obtained from dairy plants includes quantity of milk purchased, quantity of butterfat in the milk, and total dollars paid f.o.b. factory. As the questionnaires used are also used to collect data on production of manufactured products, the sample selection follows the pattern outlined previously under production estimates. Condenseries, however, report price data for milk on a plant rather than a company basis.

In selecting the sample prices of milk for cheese and milk for butter and byproducts, some limitations are imposed by the fact that State field offices gathering mid-month milk prices also send price schedules to dairy plants to obtain information on prices received by farmers for milk. No duplication between the State list and the Chicago list is permitted so that the burden of reporting by plant operators is held to a minimum. Statisticians in several State offices have taken over the work of estimating monthly production of butter and cheese and prices paid by manufacturing plants for milk used for these purposes. They submit recommendations to the Chicago office for their particular States.

The quantity of milk received, total pounds of butterfat in milk, and total dollars paid for the milk delivered to the plants are listed and summarized by States. In a few instances, estimates are made for missing reports when the State average would be materially influenced by omitting data for a plant that normally reports. State totals are carried to summary sheets and State averages on prices per 100 pounds of milk, butterfat test, and prices per pound butterfat in the milk are computed. State averages so obtained are carefully reviewed in light of various check data such as historic series of butterfat test and wholesale prices of butter and cheese at terminal markets.

National average prices paid for milk used for cheese, by types, are obtained by weighting State averages by current estimates of cheese production. National average prices of milk for butter and byproducts are the result of weighting State average prices by the approximate quantity of milk used for butter. On milk for canning, State average prices are combined in accordance with the volume of milk reported as price data are obtained for nearly all the milk purchased by condenseries. Late reports are tabulated and the data is added to the preliminary totals and averages to give revised averages. These are published the following month for milk used for canning and early the following year for milk, cheese and butter. Charts showing historic month-to-month changes in butterfat tests of milk are used in reviewing the current data and making the estimates.

Data on prices of milk for cheese (21 States, regions and the United States for American cheese, United States for 6 other types of cheese) and milk for butter (12 States, regions, and United States) are published in "Milk prices paid at creameries and cheese factories" released about the 28th to the 30th of the following month. Prices of milk for canning ap-

pear in the "Evaporated, Condensed and Dry Milk Report" issued about the same time. United States prices of the three kinds of milk are combined to obtain a national average price of milk for manufacturing purposes. This price is used to determine parity prices of manufacturing milk and relationship of current to parity prices.

To supply a current figure, a projection of the national average price of milk for manufacturing purposes is also prepared. Separate projections are made for each of the three kinds of manufacturing milk. Estimates prepared from regression formulas utilize the relationship of prices of milk for manufacturing purposes to prices of dairy products in central markets, the price paid for milk by small samples of manufacturing plants, and the butterfat test of milk. Formulas used and items represented in them for each of the three types of milk are as follows:

Milk for butter and byproducts

$$Y_c = \left\{ \begin{array}{l} + \; 7.2916 \\ + \quad .9531 \; \text{price of Grade A butter, Chicago, 1st-26th of month} \\ + \; 1.5610 \; \text{average of weekly price of nonfat dry milk solids 1-26th of month} \end{array} \right.$$

multiplied by projected butterfat test of milk.

Milk for cheese

$$Y_c = - \; 3.1406$$
$$+ \quad .0942 \; \text{average weekly cheese prices, Plymouth 3d-26th of month}$$
$$+ \quad .8894 \; \text{estimated fat test of milk}$$

Milk for canning

$$Y_r = - \; 3.7362$$
$$+ \; 1.0508 \; \text{estimated monthly price paid by 14 Midwest condenseries}$$
$$+ \quad .9847 \; \text{estimated butterfat test of milk}$$

The estimate of monthly price paid by 14 condenseries is based on the price reported for the first half of the month + one half the change for first half to second half computed by the following formula:

$$Y_c = - \quad .4734$$
$$+ \; 4.116 \quad \text{change in Plymouth cheese price of cheddars from first two Fridays to Friday in the period 20-26}$$
$$+ \quad .825 \quad \text{change in price Chicago butter 16th-25th of month from 1st-15th of month}$$

A comparison of formula prices and prices reported by plants over the last 2 years shows a standard error of estimate of about 10 cents per 100 pounds of milk for cheese and for butter and byproducts, and of about 5 cents in the projection of the price of milk used for canning. The average price of all milk for manufacturing purposes as projected by these regression formulas has varied from the price actually reported by plants by an average of 3 cents per 100 pounds over the 2-year period. The largest difference in any single month was 11 cents.

Quarterly stocks of evaporated and canned condensed milk held by wholesale grocers.—A tabulation of stocks of evaporated and canned condensed milk held by wholesale grocers on March 31, June 30, September 30, and December 31 is made. Schedule C.E. 9–82 (see Appendix D) is sent to 614 firms and returns are received from 70 to 80 percent of the firms. Firms report stocks in cases and the cases are converted to pounds. No attempt is made to expand the stocks to total holdings or to estimate for those firms which fail to report. Data are published on total stocks reported, and comparisons of stocks held by firms reporting both currently and a year earlier, and of firms reporting currently and for the preceding quarter. Firms are also asked to estimate the number of days supply represented by their present stocks at current rates of consumption. These data are weighted together by production of each firm and published for the group reporting. Along with the report for December 31, holdings by size of can and number of cans per case are published. A comparison with data obtained during the war indicates that the samples represent between 20 and 25 percent of the universe.

FLUID MILK AND CREAM

Statistics relating to the milk and cream for fluid distribution include data as to prices paid by dealers for milk, prices obtained by them for wholesale and retail sales, and estimates of consumption of milk and cream by nonfarm consumers.

Dealers' buying prices and retail selling prices of milk for fluid distribution are compiled for some 110 major city markets. Markets included are mostly the larger metropolitan areas, together with the more important cities in less populated areas. Data are collected on inquiry (form C.E. 9–29, Appendix D). As prices tend to be rather standardized within markets, data are obtained only from one or two reporters in each market. Milk distributors, milk marketing and bargaining cooperatives, and public officials are included in the list of reporters.

Schedules are mailed to reporters about the 28th of the month. Some 275 schedules are sent out, of which approximately 200 are returned. Many of the respondents return an incomplete schedule which necessitates the sending of more than one schedule in order to obtain complete data from a given market. Prices reported are those in effect early in the month. As a general rule, the tenth day of each month serves as a cut-off day and statistics on prices published each month represent those reports received on or before that date. For important markets, telegraphic or telephone communication may be used to obtain reports not returned by the tenth. Price changes reported between the 11th

of the month and date of publication of the figures (about the 16th of the month) may be commented on in the release, but they are not shown in tables until the following month's report. In a few States, the State agricultural statistician obtains reports for a market or group of markets in his State.

Rather detailed price information for fluid milk is obtained. Distributors' buying prices for milk used for fluid consumption and for milk used to obtain cream for consumption in fluid form are reported, together with applicable butterfat tests and butterfat differential. To obtain comparability between markets, reported dealers' paying prices are also converted to a common butterfat basis (3.5 percent) and quoted f.o.b. city wherever possible. As the classified price buying plan is widely used in large city milk markets, prices are usually quoted as class I (milk for fluid use) and class II (most commonly milk purchased for separation of cream to be sold as fluid cream). In some markets only a flat [16] price is available. Distributors' selling prices are also reported, including wholesale list prices for milk sold in bulk and in quart containers and retail prices for milk delivered to homes and sold at stores. Retail prices cover sales in quart, half-gallon, and gallon containers in markets on which retail sales are made in container sizes other than the quart. Retail delivered prices are obtained for special grades of milk (price ranges) and cottage cheese, and retail home-delivered and out-of-store prices for light or table cream and for whipping or heavy cream in about 35 markets. Net average prices received by producers for milk sold are reported from about 35 milk producer cooperative bargaining or marketing associations for the most recent month available, usually the second preceding month.

Averages of dealers' paying prices for class I milk are obtained for each of the nine geographic divisions and for the United States by combining prices for the markets included, giving each market equal weight. The desirability for many purposes of a weighted average price is recognized, but facilities and funds have not been sufficient to obtain the representation of markets and the information on volume needed to prepare satisfactory United States averages and to rework the series over a period of years for comparative purposes. An unweighted average retail price for home-delivered standard-grade milk (defined as the grade and type of milk most commonly sold) for the current month is computed for 25 large city markets. These averages, together with data for some 110 individual markets, are published.

Nonfarm consumption of fluid milk and cream.—National estimates of consumption of fluid milk and cream in cities and villages have been prepared for the years 1923 to date and for 1921. The levels of the estimates of total consumption of fluid milk and cream were established for the 1929-31 period on the basis of per capita consumption figures obtained from city boards of health, the total nonfarm population, and balance computations of production and disposition of milk. Estimates for the years preceding 1929 were obtained by applying percentage changes in consumption of fluid milk and cream in identical markets as reported by boards of health to the estimate in the base period.[17] From 1932 through 1938 estimates were likewise based primarily on changes in consumption of milk and cream as reported by city boards of health.[18] In 1939 and later years, national estimates have been carried forward on the basis of year-to-year changes shown by data for larger cities available from market administrators, milk-control boards, and milk dealers, and in smaller cities from city health officials, together with consideration of annual balance sheets of milk production and utilization. The need for more precise estimates of consumption and for more comprehensive information by areas and markets has resulted in a number of special studies in this field.

Initial investigations were directed toward marketing areas in the northeastern United States, ranging from Boston, Massachusetts, to Richmond, Virginia, and including New York City, Philadelphia, and the entire States of Rhode Island, Connecticut, and New Jersey. Data as to monthly sales of fluid milk and fluid cream, or volume of milk classified for these uses, were obtained from secondary sources. These sources included Federal and State milk-price-regulating agencies, milk producers cooperatives, State colleges, and municipal health departments. Data used were obtained either from published reports of these agencies or directly from the agencies through mail or personal contact. Data obtained were translated into seasonally adjusted sales data and daily average sales were calculated. The data showing sales of milk and cream, in turn, were matched against estimates of the annual average milk-consuming population living in each marketing area to obtain estimates of per capita consumption of fluid milk and fluid cream. For the three

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[16] So-called because one price is paid for all milk purchased by distributors in a few markets irrespective of how the milk is to be used.

[17] United States Bureau of Agricultural Economics. Milk and cream consumption in cities and villages, 1932. [Processed.]

[18] Methods of handling the Board of Health information in making these estimates is described in: Sprague, Gordon W., and Foelsch, Gertrude G. Estimating yearly changes in fluid milk and cream consumption in cities and villages, Bur. Agr. Econ., 1938. [Processed.]

States, population estimates were based on July 1 resident population estimates issued by the Bureau of the Census with deductions for the number of people living on places with milk cows. For individual markets, population data were based on Census Bureau estimates of metropolitan area population, supplemented by information from State censuses and other sources. Considerable analysis of existing population data was necessary to obtain a population figure comparable to the milk and cream sales area.[19]

Work is currently proceeding on a project designed to determine per capita consumption of fluid milk and fluid cream in principal urban markets and by States. The project is designed to develop historical estimates for recent years that will provide market and area data and that can be used also for checking and improving present national estimates of the quantity of fluid milk and cream consumed annually in cities and villages. In developing the historical series, material from secondary sources will be used. In addition to those outlined in the pre-

ceding paragraph, data resulting from administration of wartime orders of the Federal Government limiting the sale of fluid milk, fluid skim-milk items, and fluid cream will be utilized. These must be critically reviewed, supplemented when necessary by additional data and analyzed to determine annual sales of fluid milk, fluid-milk drinks, and fluid cream. The wartime orders were administered by local agencies in about 140 milk markets. Data from 60 of these markets have been subjected to careful study, and data for the remaining 80 market areas will be used when possible. This material, together with supplementary information available from other sources, is to be used to estimate consumption of fluid milk for the year 1944. It is proposed to work this series forward and backward from the 1944 bench-mark year through the use of various check data and thus to obtain a series that will show annual consumption of fluid milk and cream in markets and regions from 1938 to the present. Efforts are to be made to obtain reliable current information concerning sales of fluid milk and cream in a sample of city markets. These will provide a basis for the preparation of current statistics showing changes in consumption of milk and cream in principal markets and in different sections of the country.

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[19] For discussion of population estimating problems see O'Donnell, P. E. Consumption of fluid milk and cream in northeastern marketing areas, Bur. Agr. Econ., 1948. [Processed.]

CHAPTER 13. POULTRY

By E. Smith Kimball and Robert F. Moore

SCOPE

The estimating program of the Department of Agriculture for poultry and poultry products currently comprises these types of estimates:

1. Chickens and turkeys on farms on January 1, by classes, value per head, and total value, by States, are published in February of each year.
2. Composition of farm chicken flocks on October 1 is published in October.
3. Number of layers on farms, rate of lay, total egg production, young chickens, and potential layers on farms, by States, are published monthly in the Crop Report.
4. A hatchery report covering chicks hatched, eggs in incubators on first of month, chicks sexed, and chicks booked for future delivery, by States, is published each month.
5. Farmers' intentions to buy baby chicks are estimated and published, by geographic areas, in February of each year.
6. Movement of chicks into 7 large commercial broiler areas is published weekly by the State offices concerned.
7. A preliminary estimate of number of chickens raised, by States, is published in July.
8. Growers' intentions to raise turkeys, by States, are published in January of each year.
9. A preliminary estimate of turkeys raised, by States, is published in August of each year.
10. Farm production and disposition of turkeys and cash receipts and gross income from turkeys, by States, are published in March of each year.
11. A report on production of liquid, frozen, and dried eggs is published monthly.
12. A report on canned poultry is released monthly.
13. Farm production and disposition of chickens and eggs and cash receipts and gross income from chickens and eggs, by States, are published in April of each year.
14. Miscellaneous estimates of such phenomena as distribution of poultry marketings by months, layer deaths, breeds of chickens on farms, and consumption of feed are published occasionally.

This discussion of estimating methods does not follow the above sequence exactly.

ESTIMATES OF CHICKENS ON FARMS JANUARY 1

The Census of Agriculture furnishes a bench mark every 5 years for the Department's estimates of all chickens on hand on January 1. Adjustments both for incompleteness of enumeration and to convert census numbers to a January 1 basis when the census has been taken on some other date are necessary. These adjustments are accomplished by essentially the same methods as in the case of livestock, which were discussed in some detail in chapter 11. Annual changes in numbers of chickens on farms January 1 are based largely on reported changes in per flock averages of all chickens from year to year and on percentage changes in numbers of chickens in flocks on identical farms obtained from the rural carrier livestock survey made in December of each year. An additional indication considered is the change shown by about 30,000 flocks owned by general crop respondents.

In estimating the change from year to year in all chickens on farms January 1, regression charts are used for each State on which are plotted the latest estimates made by the Crop Reporting Board of actual number of chickens on that date against the sample average number of all chickens on farms for a series of years. Having computed the sample average per flock an estimate of chickens on farms can be read directly from the chart.

Another set of State regression charts show the Board's final estimates as percentages of previous years plotted against the sample identical percentages. The final Board percentage read from this chart is applied to the estimate of chickens on hand January 1 of the preceding year to obtain a current indication of chickens on hand.

COMPOSITION OF FARM FLOCKS ON OCTOBER 1

A preliminary estimate of the composition of farm flocks is made in October of each year, preceding the January 1 final report referred to above. Data for the report are collected on the October general crop schedule and published in the Crop Report. The report shows the following classifications: pullets of laying age, pullets not of laying age, other young chickens, all young chickens, hens one year old and older, and potential layers.

EGG PRODUCTION

Production of eggs is determined by estimating the number of layers in flocks, estimating the number of eggs laid per 100 hens, and finally multiplying the number of layers by the rate of lay to get total production. Numbers of layers change rapidly because of sales, deaths, culling, and movement into laying flocks of pullets from the current year's hatch. The rate of lay has a very pronounced seasonal pattern, which is often modified markedly by unseasonable weather and in particular by extreme heat and cold. Complicating the estimating problems

is the fact that there are actually two universes—farm flocks and commercial flocks—which have different seasonal patterns as well as levels of numbers of layers and rate of lay; these two types of flocks must be combined in the published estimates.

Producers can move into and out of the chicken business with rapidity. This makes it difficult to measure adequately the number of producers from year to year. Indications of changes in the average size of flocks do not furnish a fully satisfactory clue to the change in number of flocks. Even census counts of the number of flocks do not give the complete answer if one enumeration is more or less complete than another.

The number of layers in farm flocks on January 1 of the census year is derived by multiplying the adjusted number of all chickens on farms by the percentage of layers in farm flocks as shown by about 30,000 crop respondents who report on the composition of their flocks as of January 1. Annual estimates of changes in number of layers between censuses are based mainly on reported changes in flock averages of layers from month to month and year to year and on percentage changes in flocks on identical farms (same farms reporting for both years under comparison) obtained from the rural carrier livestock survey made each December; also on changes shown by about 30,000 flocks of the general crop respondents.

Starting with the estimated number of layers on January 1, the change in number of layers from month to month is estimated from changes shown by per flock averages of layers in flocks as reported by crop respondents on the first of each month. The estimated number of layers on hand during the month is the average of the number on hand on the first of the month and the number on hand on the first of the following month. These averages are kept in their proper perspective by the use of charts on which per flock averages are plotted against months of the year to show seasonal change as well as changes from year to year. (See figure 33.)

The rate of egg production per layer is determined by dividing the average number of eggs produced by crop respondents' flocks on the first day of each month by the average number of layers in their flocks on that date. The daily average rate for the month is the average of the rate on the first of the month and the rate on the first of the following month. Adjustments are made in the computed monthly rate of lay to allow for differences in the level between the rate shown by the sample and the rate of all flocks. The rate per layer during the month is the average daily rate multiplied by the number of days in the month. Charts
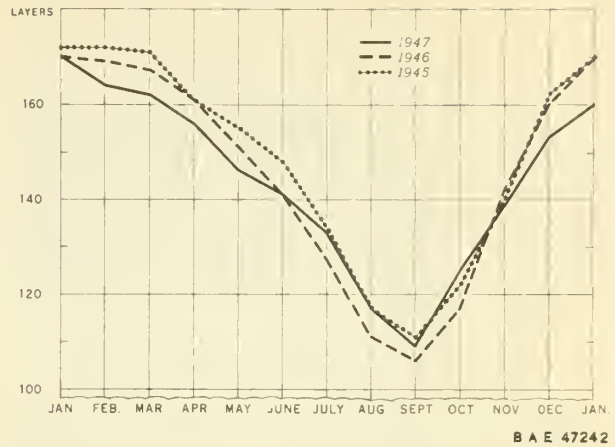
FIGURE 33.—Layers per farm flock on first of month, Iowa.

similar to those used in arriving at "change in layers" are used in arriving at "rate of lay on first of month." The rate of lay is plotted against time. (See figure 34.) Total monthly farm production of eggs is derived by multiplying the average number of layers on farms during the month by the monthly rate of lay per hen.
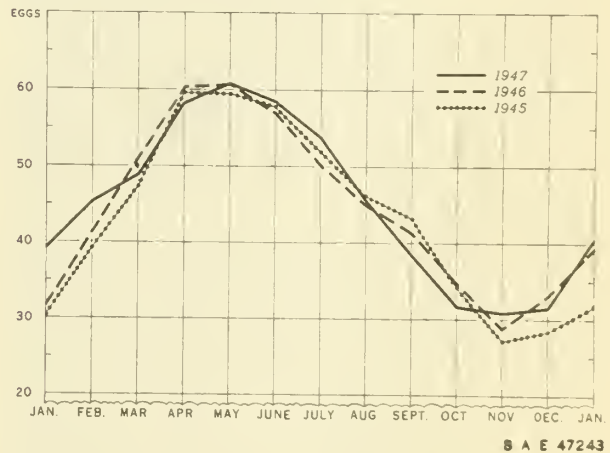
FIGURE 34.—Eggs laid per 100 layers on first of month, Iowa.

ESTIMATES OF YOUNG CHICKENS ON FARMS

As estimates of layers are made as of the first day of each month, it is a rather simple process to estimate the number of young chickens on that day by using the relationship of young chickens to layers. Considerable care is taken to maintain a comparable series of num-

bers of layers and young chickens per flock, to show the seasonal and annual changes. For example, the total of all layers reported in the sample is divided by the number of flocks in the sample to give the average number of layers per flock. The average number of young chickens per flock is obtained in the same way. The average number of young chickens per flock is then divided by the average number of layers per flock to get a ratio that can be applied to the estimate of number of layers on that date to obtain an indication of numbers of young chickens.

COMMERCIAL HATCHERY PRODUCTION

Basic data for hatchery estimates are obtained from comprehensive surveys of the industry made at intervals of about 5 years by the Department of Agriculture. No information is obtained by the Census of Agriculture from hatcheries. The most recent extensive survey of hatchery operations was made in 1943. In each comprehensive survey, effort is made to obtain at least the capacity of every commercially operated hatchery in the United States. For periods between these bench-mark surveys, estimates are based on sample data obtained on a voluntary basis from a large segment of the industry.

The method used in estimating the base-year production can be called the ratio of production to capacity method, which was described in some detail in chapter 5. The ratio of chick output to capacity is the number of chicks hatched per unit of capacity. As the number of chicks hatched per unit of capacity varies with the size of hatchery, the total operating capacity is established for each of eight size groups within each State.

Taking each size group as a unit, the ratio of chicks hatched to total capacity is calculated for those hatcheries which reported on both capacity and production. These ratios are applied to the total estimated capacity of all hatcheries in the respective size group in order to derive the total chicks hatched for the groups. This procedure assumes that within a certain size group, operations of hatcheries that did not reply to the questionnaire would be approximately on the same scale as those of hatcheries that did reply. The sum of the totals of the eight size groups is the estimated total production for the State. In 1943, hatcheries having 72 percent of the total estimated egg capacity of all hatcheries in the United States reported their annual production of chicks. Estimates of total hatchings based on these returns indicate that these hatcheries produced about 73 percent of all chicks.

When annual estimates of production for each size group have been established, revised estimates of monthly operations during the year are made by distributing annual production by size groups according to the monthly percentage distribution shown by hatcheries that reported monthly operations.

In making current monthly estimates of chicks hatched, two methods of arriving at the number hatched each month have been developed. One method is to compare hatchings reported by a group of hatcheries with their hatchings in the corresponding month a year earlier. The percentage change is applied to the monthly estimate of a year earlier to get an indication of the monthly hatch for the current year. The other method is to compute the relationship between number of chicks hatched during the month and total capacity of hatcheries reporting. This ratio is applied to estimated capacity of all hatcheries to get an indication of number of chicks hatched. The estimate finally adopted is based on indications obtained by the two methods.

The estimate made of chicks hatched in Wisconsin in April 1949 will serve to illustrate the method of estimating monthly hatch. Thirty-two hatcheries reported on operations for the month. Twenty-four out of the thirty-two also reported in April 1948—a year earlier. These 24 firms showed a percentage hatch, as compared with the number hatched in April 1948 of about 105 percent. The 32 hatcheries, including the 24 that reported for both years, showed that the number of chicks hatched in April was equal to 55.8 percent of capacity of the hatcheries. These indications were applied to the respective base data—8,000,000 chicks estimated hatched in April 1948 and 14,600,000 total egg capacity of hatcheries in Wisconsin.

$$8,000,000 \times 104.7 = 8,376,000$$
$$14,600,000 \times 55.8 = 8,147,000$$

The State Statistician's recommendation for the number of chicks hatched in April 1949 in Wisconsin was 8,200,000, which was accepted by the Board.

At the end of the year State Statisticians make a complete canvass of the industry in their respective States to check on total capacity of hatcheries and to obtain reports from those not reporting during the year. Although not all hatcheries are heard from at the end of the year, many that do not report on a monthly basis furnish a report at the year's end. Through direct contacts with hatcheries, the State poultry extension service at the State College and officers of the International Baby Chick Association and Poultry Improvement Plan, State Statisticians have been able, at the close of these yearly canvasses of the industry,

to account for practically all of the hatchery capacity in their respective States. In order to obtain as exact a bench mark as possible on capacity, the previously mentioned comprehensive surveys are necessary. During 1948, current monthly estimates of chicks hatched were based on reports from an average of 1,743 hatcheries each month with a total egg capacity of 149,780,000, or 27 percent of the total estimated capacity of all hatcheries in the United States. At the close of 1948, hatchery reports were finally received from 3,758 hatcheries having an egg capacity of 295,953,000 eggs, or approximately 54 percent of the total estimated capacity of all hatcheries.

FARMERS' INTENTIONS TO BUY BABY CHICKS

Farmers' intentions to buy baby chicks during the current season are collected from crop respondents in February of each year and published in the General Crop Report. The report shows by geographic areas and for the United States intended purchases of baby chicks as a percentage of purchases during the preceding year. It also classifies intended purchases on a percentage basis into straight-run chicks, pullet chicks, and cockerel chicks.

COMMERCIAL BROILER ESTIMATES

Annual estimates of commercial production of broilers are made in 38 States. This report on production also includes average prices received per pound for broilers and gross income from all sales. Weekly reports are released in 7 major commercial broiler areas showing movement of commercial broiler chicks into these areas each week, prices paid producers for eggs for hatching, prices paid for broiler chicks, and prices received by producers for their broilers. In some of these areas weekly estimates of marketings of broilers are made. These annual and weekly estimates are based on reported sales of commercial broiler chicks by hatcheries, reports from broiler producers, feed dealers, and chick brokers and on records from dressing plants.

In making weekly estimates of movement of chicks into commercial broiler areas, schedules are sent to all hatcheries producing chicks in these areas. As the coverage is more than 95 percent complete in these areas, the estimate is merely an addition of the chicks reported as produced in these areas, with an allowance for hatcheries not reporting. Data are collected from express companies, air fields, and truckers, showing shipments of chicks into and out of these areas. Final movement of chicks into a particular area amounts to chicks produced by hatcheries in the area, plus chicks shipped into the area, less those shipped out of the area.

ESTIMATES OF CHICKENS RAISED

Estimates of chickens raised are based on numbers of young chickens on hand the first of each month from April to January reported on the General Schedule, and indications from the June rural carrier survey. In making final estimates of chickens raised during the year, monthly estimates of young chickens derived as explained above are considered, along with estimates of number of salable chicks hatched as shown by commercial hatchery reports. The method used in estimating production of chicks is explained in an earlier section. Production of young birds in farm flocks is continuous from January to August and movement into commercial flocks takes place on a varying scale throughout the year. Regardless of the date selected to indicate changes in numbers of young chickens from year to year, there is always the necessity of estimating the change in numbers sold or eaten before that date and the number to be raised after that date. Estimates of number of chickens raised are based on indications of percentage change from year to year, applied to the final estimate of the preceding year. Relative changes in the average per flock and identical comparisons are interpreted on regression charts in arriving at estimated change from the previous year.

Estimates of the number of young chickens raised are the basis for estimating the number of pullets that will be available for addition to the laying flock. Here again per flock averages of chickens raised and of pullets at the end of the year are used to get a ratio. This ratio is applied to July preliminary estimates of chickens raised to get an estimate of the number of pullets to be added to laying flocks by the end of the year. In forecasting the probable change in number of layers for the coming season, indicated changes in number of old hens, number of pullets, and feed-egg price ratio are all considered.

TURKEY ESTIMATES

Three turkey reports are made each year. In January estimates are made of the number of poults that producers intend to buy or hatch during the current year. Information from a special schedule mailed direct to turkey producers is used as the basis for the estimates. The sample return usually covers about 10,000 flocks and more than 9,000,000 turkey poults. These estimates are also based on changes in per flock averages from year to year. Regression charts showing sample behavior over a period of years are used in arriving at the estimates.

In August a preliminary estimate is made of the number of turkeys raised. A special schedule is sent to turkey producers and this is supplemented by the June rural carrier livestock survey, which covers about 20,000 turkey flocks and 12 million birds. The estimate of number of turkeys raised is based on number of young turkeys per farm on August 1 compared with number per farm a year earlier, and comparisons of numbers reported by the same producers in both years ("matched" or "identical" reports). The estimated percentage change is arrived at by means of regression charts and it is applied to number of turkeys raised the previous year to derive the estimated numbers.

Estimates are made each year of the number of breeder hens and market birds on farms January 1 and final estimates are published of turkeys raised during the preceding year. These estimates are based on changes in per flock averages and indications from identical reports. The sample used in this special January survey includes about 10,000 flocks and 15 percent of the turkeys in the United States. Data as to farm consumption of turkeys, death loss of breeders, and prices of turkeys sold for meat are also collected and used in preparing a production, disposition, and income report, which is published in March each year.

PRODUCTION OF LIQUID, FROZEN, AND DRIED EGGS

A report issued monthly gives estimated output of all plants breaking eggs. The sample covers on the average about 200 plants from a universe of 217 plants. The report includes total production of dried eggs and the source of the eggs used for drying (whether the liquid egg is from fresh shell eggs, storage shell eggs, or frozen eggs). Disposal of liquid egg production (produced for immediate consumption, used in drying, or frozen) is also shown.

CANNED AND EVISCERATED POULTRY REPORT

This report covers all poultry canned and used in canning in the United States. Reports from the Poultry Inspection Service, Production and Marketing Administration cover about 95 percent of the total poultry canned each month. The remaining 5 percent is based on reports from plants not under Federal inspection.

SPECIAL REPORTS

Various special reports are issued during the year from data obtained from crop respondents and special lists of poultry producers. These reports cover monthly distribution of farm poultry sales during the year, the percentage death loss of layers, baby chick and poult prices, breeds of chickens on farms, feed fed to chickens, and other data related to production and disposition of poultry and eggs.

A final production, disposition, and income report by States is published in March, based on analysis of all data obtained pertaining to production in the preceding calendar year. These estimates are based on data obtained from crop respondents and special lists of poultry producers, as well as an analysis of various market records, commercial hatchery returns, and other available records on poultry and eggs.

NONFARM POULTRY

The picture of total production of poultry and eggs in the United States cannot be made complete until an adequate measure is obtained of nonfarm production of poultry and eggs. No recent census enumeration has supplied information as to the size of this nonfarm production, but a nonfarm sample survey conducted in 1949 by the Bureau of the Census included questions on hens and pullets and production of eggs. This was the first time an effort had been made to sample the nonfarm segment. Such surveys should provide information needed to adequately measure numbers of nonfarm poultry and nonfarm production of eggs for the country as a whole. However, they would need to be made more frequently to show seasonal variations in numbers and production. They would also need to be more extensive to provide data by States.

By Paul W. Smith

When most people think of bees, they think of them as producers of honey. Yet bees are vastly more important as pollinizers of many crops, especially fruits and legumes. They are the only pollinators controlled by man, and can be moved and increased in numbers at will. An increasing awareness of the importance of bees in pollinating crops has been accompanied by a demand for more and more information about the number and location of bee colonies, the production of honey per colony by States, and shipments of package bees and queens.

In response to this demand, the Crop Reporting Service in 1939 and 1940 prepared basic estimates for each State of total numbers of colonies of bees and total honey production. The base number of colonies was estimated from a study of all available data. The accuracy and completeness of these data varied between States, but they included the United States Census enumerations, State inspection records, and estimates by State apiary inspectors and entomologists (where available), and reports from commercial honey buyers and packers. The estimates of average yield per colony were based on data from these same sources plus sample data that had been collected annually from bee keepers for many years.

NUMBER OF COLONIES

After the 1939 base number of colonies had been established, estimates for the following years were derived by applying the year-to-year indicated percentage change (obtained from annual reports of bee keepers) to the preceding year's estimate of total number of colonies. One indication of change from year to year is obtained by matching identical July reports, that is, successive reports from individual producers who report in both years. Another indication of annual change is derived from two questions on the July honey schedule, one asking "number of colonies on hand now," the other "number of colonies on hand a year ago." The sum of all colonies "on hand now" divided by the sum of colonies "on hand a year ago" gives a second indicated percentage change from the previous year. These two indications for a series of years are plotted as the independent variables on charts on which the Crop Reporting Board's final estimates of percentage change for the same years appear as the dependent variable. The current year's indications are read on these charts to obtain the Board estimated percentage change.

In some States very good check data on numbers of colonies are available in the inspection records collected by State agencies. Where such records are obtainable they are given consideration in making the estimates.

HONEY PRODUCTION

The annual average yield per colony is obtained from replies to a mailed inquiry to bee keepers. Total reported honey production is divided by the number of colonies producing the honey to derive a figure for the yield per colony. To arrive at State totals of honey production, the estimated total number of colonies in each State is multiplied by the average yield per colony.

Three mailed inquiries are made each year, in July primarily to obtain number of colonies, in September to obtain probable honey production, and in December to obtain the final estimate of colonies, yield per colony, and honey actually produced (see C.E. 2–8299, Appendix D).

The July Honey Report contains, by States, the number of colonies of bees on hand, the percentage of colonies lost during the winter and spring, new spring colonies as a percentage of all colonies, and condition of bees and nectar plants on July 1.

In October a report is issued giving estimated number of colonies, probable yield of honey per colony, and preliminary estimates of honey production. This report also shows the stocks of honey for sale in producers' hands on September 15.

The January report on Honey and Beeswax Production includes final estimates, by States, of the number of colonies; yield per colony; production of honey for the year; beeswax production and prices; wholesale and retail prices for all honey, comb honey, chunk honey, and extracted honey; honey stocks for sale in producers' hands December 15; and honey left in hives for bees' winter stores.

PACKAGE BEES

A report regarding package bees is issued early in March covering the package bee industry, which is located mainly in Georgia, Ala-

bama, Mississippi, Louisiana, Texas, and California. This industry derives its revenue from the sale of package bees and queens.

The package bee report covers, by States, (1) the total number of pounds shipped the previous year, (2) the number of 2-pound, 3-pound, 4-pound, 5-pound and other package units shipped, (3) expected bee shipments in the current year, (4) advance orders on hand January 15, (5) colonies held the preceding year for production of package bees, (6) pounds of bees shipped per colony, and (7) the number of queens shipped by package-bee shippers. A sample return covering more than 60 percent of the package bee shippers is usually obtained.

The same general method is used in estimating shipments of package bees as is used in estimating colonies of bees and honey.

CHAPTER 15. PRICES

By B. R. Stauber, George D. Harrell, and Roger F. Hale

SCOPE

In 1867 the Department of Agriculture began to assemble statistics on prices received by farmers for the agricultural products they sold. Collection of data began by asking farmers to report prices received for crops sold. Collection of prices monthly was begun for several commodities in 1908, it has been expanded from time to time until now estimates are made of prices received by farmers on the 15th of each month for about 125 commodities (including seasonal crops in season). Estimates on an annual basis are made for another 95 commodities.

It became apparent that data concerning prices received for farm products alone were inadequate as a measure of rural prosperity. It was recognized that a better measuring stick would be the purchasing power of agricultural commodities. In other words, how many bushels of wheat would it take to buy a pair of shoes; how many tons of hay to buy a mower; and would it take more or less of these farm commodities to buy shoes, cornflakes, and mowers this year than it took last year or 10 years ago? As a result of such questions, in 1910 the Department of Agriculture inaugurated the collection of data concerning prices paid by farmers for food, clothing, farm machinery, and various other items. Beginning with annual data on 89 commodities in 1910, the number of commodities priced has been expanded from time to time until prices are now collected on nearly 500 items in retail stores patronized by farmers the country over. Some items are priced monthly; others quarterly, semi-annually, or annually.

These two sets of prices form the basis for two series of index numbers—the Index of Prices Received by Farmers, and the Index of Prices Paid by Farmers Including Interest and Taxes. The latter is known as the Parity Index. The Ratio of the Index of Prices Received to the Index of Prices Paid, including interest and taxes, is known as the Parity Ratio. This ratio is widely used to measure the average relationship of prices received by farmers to corresponding parity prices.

In addition to their use for parity calculations, data on prices are used for other purposes by farmers, farm organizations, marketing agencies, the trade, and the Congress. They are required in the calculation of value of farm production, in estimating income from marketing of farm products, in farm-management analyses, in cost determinations, and in many related studies. They contribute directly or indirectly to the solution of problems which range from individual decisions or group action to considerations of national policy.

USE IN CONNECTION WITH PRICE-SUPPORT PROGRAMS

Price data (prices received and prices paid by farmers) provide the starting point for most of the analyses that show trends in the welfare of farmers over time and relative to other segments of American life, irrespective of whether the comparisons are in terms of income, receipts from marketings, or price indexes. In addition, they provide one of the principal means by which the need for price-support programs is determined, as well as many of the bench marks for the conduct of the various programs after they have been inaugurated.

The desirability of major agricultural programs to relieve agricultural distress and to promote the general welfare has been recognized as an integral part of public policy for more than a decade.

Programs currently in effect center primarily around the concept of parity which was first given legislative definition in the Agricultural Adjustment Act of 1933 and which declared that it was the policy of Congress, among other things, to: ". . . reestablish prices to farmers at a level that will give agricultural commodities a purchasing power with respect to articles that farmers buy, equivalent to the purchasing power of agricultural commodities in the base period. . . ."

Subsequently, in the Agricultural Adjustment Act of 1938, Section 301a, parity was somewhat more explicitly defined as follows: " 'Parity', as applied to prices for any agricultural commodity, shall be that price for the commodity which will give to the commodity a purchasing power with respect to articles that farmers buy equivalent to the purchasing power of such commodity in the base period; and, in the case of all commodities for which the base period is the period August 1909 to July 1914, which will also reflect current interest payments per acre on farm indebtedness secured by real estate, tax payments per acre on farm real estate, and freight rates, as contrasted with such

interest payments, tax payments, and freight rates during the base period. . . ."

This last definition has been amended from time to time. The most important change was a provision for post-World War I bases for certain commodities for which the August 1909-July 1914 base period was deemed inadequate or unsuitable. Under this formula, parity prices as of a given date are computed by multiplying the average price received by farmers during the base period by the then current index of prices paid by farmers (including interest and taxes for a commodity with a pre-World War I base period, but excluding interest and taxes for a commodity with a post-World War I base period).

According to existing legislation, parity prices will continue to be calculated under the formula described above until January 1, 1950. In the absence of further legislation, parity prices after that date will be calculated in accordance with the Agricultural Act of 1948. The major change with respect to parity in this Act consists of establishing an adjusted base price which will reflect changes in technology, farm practice, and economic conditions, so that the parity price of a commodity is not tied irrevocably to a fixed base. It will reflect subsequent changes. The Agricultural Act of 1948 would not change the index of prices received and of prices paid including interest and taxes, but the base-period price for any commodity would be derived as follows: The average price of a particular commodity for the previous 10 years would be divided by the average of the index of prices received by farmers over the same 10 years. The resulting quotient is the adjusted base-period price. When multiplied by the current index of prices paid, including interest and taxes (often known as the Parity Index), this would give the current parity price.

In April 1949, the Secretary of Agriculture proposed certain further modifications in the method of establishing a general guide to the level of support of farm-product prices. Irrespective of the particular formula which may be selected, data as to both prices received and prices paid play an integral part in the process of establishing the support level. Also, whether the actual mechanism of support contemplates the use of direct purchase, nonrecourse loans, marketing agreements, direct compensatory payments, or some other method, these same price data play an important part at various stages in the administrative process.

GENERAL PROCEDURES

Much the same procedures are followed in preparing price estimates, either of prices received or prices paid, as in preparing estimates of acreage or yield. Major field operations are mailing, listing, editing, summarizing, evaluating, and transmitting indications and recommendations to Washington. In Washington, major operations are review and evaluation of field offices reports and supplementary information, adoption of Board estimates, preparation of United States indexes, calculation of parity prices, and preparation and publication of scheduled reports.

Mailing of questionnaires is handled by the 41 field offices of Agricultural Estimates, with the exception of the chain-store lists for data on prices paid by farmers, which are handled from Washington. Mailings are timed to put the questionnaires into the hands of reporters as nearly as possible on the date to which the prices relate. This is ordinarily the 15th of a month. Reported data are listed by price-reporting districts on specially prepared sheets, with headings that correspond to the questionnaire headings. Respondents' notes needed to explain quotations reported are also shown on the listing sheet. If a range or series of prices for an item is reported, it is listed, but ordinarily it is not used in computing averages.

After listing, the sheets are edited by a member of the technical staff of the field office. This editing is intended: (1) To detect, by inspection, errors made by the respondent in reporting prices, or by the clerk, in transcribing the data; (2) to review the reasonableness of the quotations reported and their comparability as a whole with previous reports. Most prices reported may be expected to fall into patterns that resemble the normal frequency distribution, but some exceptions occur, and familiarity on the part of the statistician with the character of the "universe" in question helps in detecting the presence of unusual circumstances. The statistician, for example, is expected to detect and adjust a price reported in a unit of measure different from that specified. A merchant may report the price of flour in 10 pound sacks instead of in the 25-pound sack specified in the questionnaire. Again, apples are sold by the bushel, by the barrel, by the box, or by the ton in various parts of the United States. Even in the same locality, two or more different units of measure are often used. The statistician should know and understand local customs so that he may detect and remove the effect of such "nonstatistical" factors. At the same time he must not substitute his own judgment for the data.

After editing, averages are computed by price-reporting districts, and unweighted State averages are computed. Weighted averages are also computed when suitable weights are available. Generally, current weights are not available for prices-paid items within States, but

prices-received data are usually weighted by district sales or production estimates.

At this point the statistician reviews the entire set of data, compares price changes of similar or related commodities and in central markets, adjusts for known biases, using regression charts, and makes other comparisons or analyses that will help him evaluate the data. The price pattern may be affected by the progress of harvest, abnormal quality characteristics, unusual expenses, deficiencies in local supplies, lack of shipping facilities, or any one of a host of other factors. In some cases, the statistician may clarify doubtful points by conferring with persons who are especially familiar with the marketing of a particular commodity. Thus, he arrives at his own evaluation of the price of each commodity; he expresses this as his "recommended" price. These recommendations are forwarded to Washington on prescribed summary forms, together with the straight and weighted sample averages, the district weighting sheets, supplementary data showing price movements in central markets, and "Comments" which outline unusual considerations affecting the local market. Averages and recommendations are "rounded" according to prescribed rules.

Upon receipt of the report by the Crop Reporting Board, State averages and recommendations are transferred to commodity summary sheets for the United States. They are then reviewed by members of the Crop Reporting Board. The Board considers the recommendations from each State in relation to the indicated averages and the level of reported prices in other States, keeping in mind usual geographic differences, relative degree of change since the previous inquiry, amount of change shown by comparable price data from other sources, and available terminal-market price quotations. The recommended price is accepted by the Board unless it appears unreasonable in view of the various indications. When a departure is made from the State Statistician's recommendation, notes explaining the change are prepared for the information of the latter, and Board estimates are entered on a copy of the State summary to be returned to the State office.

After review, State estimates of prices paid by farmers are weighted by estimates of quantities purchased in each State to obtain the national average. Weights are obtained from the best sources available, which vary with different commodities. Weights for most family-living items are derived from the product of two factors: (1) Average family consumption, and (2) the number of farm families. Other commodity weights are drawn from such other information as may be obtainable. In the case of

prices received, State averages are weighted by estimated marketings or production to obtain national averages.

Price information by position of sale or utilization of crop is obtained by special inquiries designed for this purpose. Tabulations of returns by particular areas are also made from time to time to assist in the administration of many programs.

REVISIONS

After current monthly price estimates have been issued, more complete data which become available sometimes indicate the need to revise the price originally adopted for a commodity. To minimize confusion a regular, systematic procedure for publishing revisions has been devised. For most commodities revisions are published in "Agricultural Prices" one year after the date to which they apply.

PRICES RECEIVED BY FARMERS

Definitions.—The series of "prices received by farmers", as collected by the Department of Agriculture, relate to the average prices farmers receive for their products sold at local markets, or at the point to which farmers deliver their products in their own conveyances, or in local conveyances which they hire for the purpose. The average price concept is that of a price which, if multiplied by the total quantity of the commodity sold, would give the total sum received by all farmers for that commodity.

Average prices for 125 of the more important agricultural commodities are collected monthly as of the 15th of the month (including seasonal items in season). These prices are used to represent the average price for the commodity received for the month. An exception is milk sold at wholesale, for which prices apply to all milk sold throughout the month. However, these milk prices are not known until after the end of the month. Consequently, preliminary prices for the current month are published monthly, and these are revised a month later on the basis of more complete information.

Prices of about 95 additional items are collected on an annual or season-average basis only. These crops have either relatively short marketing seasons—cherries are an example—or they are of relatively minor importance, and season prices for them are considered adequate. A few of the prices for minor commodities are collected each December 1. If all of the crop has been sold these are reported as season-average prices. If not, they are reported as the

price prevailing December 1. The December 1 series of prices was begun in 1866.[20]

On January 1 of each year inventory values per head are estimated for farm livestock by age and sex classification. These are the farmers' estimates of the value of livestock of various ages and classes, based on current and past replacement costs of similar animals.

In States in which fruits are of major importance, prices are obtained for fruit sold both for fresh consumption and for processing. Average prices of deciduous fruits sold for processing usually apply to bulk fruit at the door of the processing plant, as almost all deciduous fruit sold directly by the grower for processing changes ownership at this point. Depending upon the importance of processing, prices are obtained by processing categories, such as sales for canning, drying, freezing, crushing, etc.

Prices reported as "average" prices often do not reflect actual proportion or sales by the various utilization and method-of-sale categories. For this reason, when data as to utilization and price are available, average prices for all methods of sale are derived by weighting the average price for each method of sale or utilization by the estimated amount sold each way.

In addition to the average prices already described, another general type of related estimate has been developed to meet specific needs. When adjustments are made in actual prices to shift to some point of sale other than that at which the sale was made (for example from "f.o.b. shipping point" to "packing-house door"), the results are called "equivalent per unit returns" to growers.

Equivalent per unit returns are usually calculated for two points of sale: (1) Equivalent "packing-house door" returns refer to all fruit, regardless of methods of sale, converted to a price it would have brought if the entire crop, or the segment thereof being priced, had been sold at the packing-house door. (2) Equivalent "on-tree" returns refer to all fruit, similarly converted to the price it would have brought had the entire crop been sold on the tree.

In arriving at equivalent per unit returns, costs are added to or subtracted from prices of fruit as actually sold. For example, in order to obtain the equivalent packing-house door returns for Florida oranges, this procedure is followed: (1) The average price for fruit actually sold f.o.b., packed, is reduced by the charge for grading, packing, container, and loading. (2) The average price for fruit actually sold on tree is increased by cost of pick-

[20] Up to 1872, prices were collected on January 1, after which the collection was as of December 1. However, the January 1 prices have been considered as equivalent to December 1 prices the previous year, and have been published as applying to December 1.

ing and hauling to the door of the packing house. (3) Season average returns so derived are then combined with the reported price for the portion actually sold in bulk at the door of the packing house, by weighting the equivalent price for each method of sale by the estimated volume sold each way.

Sources of Information.—Prices received by farmers for products they sell are gathered from various sources, but mostly from voluntary reporters. In general, price reporters may be classified in the following broad groups: (1) Country merchants; (2) farm-produce dealers at local shipping points; (3) country mill and elevator operators; (4) managers of local creameries and milk-receiving stations; (5) cooperative marketing organizations; (6) country bankers; (7) well-informed farmers. The overall number of price reporters has gradually increased with the development and needs of the work, and in 1949 it totaled about 10,000.

Methods of Collection

Local market price data have been collected mainly by means of mail questionnaires. These questionnaires are probably the least expensive means of obtaining mass data, although data so collected are subject to certain limitations. Application of enumerative and probability sampling methods to price data for farm commodities has been limited, mostly because of lack of funds. The weighted stratified sample collected by mail has been considered the most practicable way to obtain local market farm price data within the available budget.

With some commodities, use of records of cooperatives or of auction sales has provided virtually complete price and quantity information concerning a segment of the market. Whenever available, such data are used to supplement information collected by mail.

The effectiveness and adequacy of the mail questionnaire depends to a large extent upon getting reports from people who know the prices farmers receive—in other words, people who are in direct touch from month to month with buying and selling farm products. The reporting list includes some farmers, but it is thought preferable that they remain in a minority. A farmer is less likely to follow the market as carefully after he sells his crop as before, so that reports from farmers may not be as current as those from dealers.

Types of price questionnaires have varied from time to time according to needs. Form C.E. 5–84, Appendix D, is an example of the general inquiry currently used in several of the North Central States for collection of monthly price information.

Prices of many farm products have a def-

inite pattern of seasonal fluctuation. On this account, and also because of memory bias on the part of reporters, it is necessary, for most commodities, to collect reports on prices regularly over the year, or throughout the marketing season. Moreover, different areas produce different crops and as the proportion of replies tends to fall if questionnaires carry commodities not grown in an area, questionnaires are regionalized. For the monthly price inquiries, 15 different regional questionnaires are used throughout the United States.

Special inquiries are made for some short-season and specialty crops grown in localized areas. These special inquiries generally ask for prices received by different methods of sale, as well as the volume bought or sold each way. Such special inquiries are used mainly for vegetables, fruits, nut crops, some minor field crops, and field seeds.

Recently, a project has been developed to collect more accurate data concerning the prices farmers receive for beef cattle. Under this project, enumerators in 11 selected States transcribe records of sales by farmers through commission firms, auction rings, packing plants, order buyers, and other cattle-marketing agencies. Within States, the markets and firms enumerated are selected according to modern principles of sampling. Enumerative survey methods have also been used for pricing certain short-season crops grown within concentrated areas, and for some other commodities for which relatively few concerns, cooperatives, or individuals handle the bulk of the output.

Other information utilized in estimating average prices includes data collected by other Government agencies, by industries and associations, or at central markets. These data vary in usefulness, depending upon their character and completeness. Thus, the average value of daily sales of tobacco on auction markets provides a highly useful guide for appraising the farm price of that crop. For some types of tobacco, after resales by speculators are removed, warehouse auction sales give practically a complete census of all sales by farmers. For grain and livestock, reports from central markets give price changes within specified quality gradations. They do not, however, account for shifts in quantities of different grades marketed.

The Sampling Problem

In theory, a sample of prices received by farmers for any given commodity could be so designed as to provide an unbiased estimate of the average for the State, to any specified degree of accuracy. However, distribution and variance of prices of one commodity do not ex-

actly follow distribution and variance of prices of any other. Consequently a sample designed for one commodity would not, in general, give equally accurate results for other commodities.

Considerations of economy require that as many commodities as practicable be covered by a single questionnaire, and this means that rarely is the ideal distribution attained for any one commodity. For other reasons too, the distribution is not ideal for each crop. Unavoidable selectivity of voluntary correspondents is probably the main handicap. This difficulty is overcome in part through stratification within States by price-reporting districts, designed roughly to reflect production and marketing patterns. Sample averages for price-reporting districts are weighted into State averages through use of production or marketing weights. This serves to reflect reported prices from each district according to the importance of the district for each commodity.

Competition among buyers also tends to overcome the sampling difficulty. Within any area, competition tends to equalize prices, grade for grade, and thus to offset at least part of the selectivity inherent in voluntary mail sampling by reducing the dispersion of prices.

Studies of the variability of these reported data on prices indicate that they are highly reliable for most items. They may, however, be subject to certain biases. The standard error of the mean for reported corn prices in figure 35 is shown to be 0.39 cents per bushel in a certain month. These standard errors do not remain absolutely constant from month to month or from year to year. They may vary with changes in marketing practices and in the relative proportions of different grades, quality, and condition of the commodity sold.

For some minor commodities, whose production is concentrated in a few localities, information as to prices may be obtained from most of the buyers of that commodity. For other minor commodities, particularly those with production widely distributed throughout a State, it is difficult to get reports from even a small percentage of the buyers, and the accuracy of the reported prices suffers accordingly.

Reports as to prices of virtually every commodity sold on a grade or class basis are subject to some involuntary bias, which varies in degree according to the commodity and the season of the year. This bias results from the tendency of reporters to think in terms of the best grade sold, and from their failure to consider the lower grades which are also being marketed.

One of the more troublesome of these commodities is beef cattle. Average prices reported for beef cattle are subject not only to bias due to fluctuations in grades, but also to bias

PRICES RECEIVED FOR CORN BY IOWA FARMERS, FEBRUARY 1947
(CENTS PER BUSHEL)

LYON 116 95 102 116 — OSCEOLA 90 116 115 — DICKINSON 117 116 118 115 — EMMET 116 118 120 100 118 118 — KOSSUTH 110 120 121 — WINNEBAGO 117 94 100 112 118 115 — WORTH 90 104 — MITCHELL 100 80 105 100 — HOWARD 110 135 110 — WINNESHIEK — ALLAMAKEE 110

DIST. No. 3 = 111; 39 reports

SIOUX 114 115 118 102 — O'BRIEN 118 100 116 118 103 — CLAY 118 120 — PALO ALTO 118 118 120 — HANCOCK 116 118 118 100 100 108 — CERRO GORDO 117 100 106 119 — FLOYD 125 100 92 120 118 — CHICKASAW 95 90 — FAYETTE 110 105 110 115 109 100 106 100 — CLAYTON 120 110 116 125 120 150

DIST. No. 1 = 113; 45 reports   DIST. No. 2 = 109; 42 reports

PLYMOUTH 113 113 98 117 103 — CHEROKEE 119 110 105 — BUENA VISTA 120 118 100 120 — POCAHONTAS 115 118 — HUMBOLDT 108 110 120 — WRIGHT 115 109 110 — FRANKLIN 118 117 — BUTLER 120 119 105 — BREMER 95 105 110 100 — BLACK HAWK 95 117 95 — BUCHANAN 108 113 105 100 110 119 — DELAWARE 110 105 110 107 110 — DUBUQUE 120 115 110

WEBSTER

WOODBURY 115 115 115 — IDA 110 120 108 — SAC 100 117 118 102 — CALHOUN 108 110 118 120 119 116 112 — HAMILTON 103 120 118 109 — HARDIN 118 118 116 120 110 115 115 — GRUNDY 120 117 110 114 115 120 120 120 — TAMA 116 120 100 116 — BENTON 108 123 121 105 110 — LINN 105 110 115 123 — JONES 111 — 120 108

DIST. No. 6 = 114; 30 reports — JACKSON

MONONA 117 118 115 — CRAWFORD 105 115 117 — CARROLL 116 105 114 — GREENE 116 117 107 118 — BOONE 114 118 114 119 — STORY 118 116 120 108 — MARSHALL — CEDAR 120 115 112 105 — CLINTON 112 110

DIST. No. 4 = 114; 42 reports   DIST. No. 5 = 114; 51 reports

HARRISON 115 115 118 118 — SHELBY 114 115 117 — AUDUBON 107 113 110 — GUTHRIE 117 108 — DALLAS 115 115 110 111 116 — POLK 118 120 113 116 116 — JASPER 110 106 110 117 — POWESHIEK 120 110 — IOWA 110 116 110 102 — JOHNSON 118 122 — SCOTT 116 118 114 — MUSCATINE 110 116

POTTAWATTAMIE 114 118 122 115 110 — CASS 110 100 — ADAIR 115 — MADISON 118 110 — WARREN 110 105 — MARION 110 105 — MAHASKA 112 115 117 — KEOKUK 110 110 120 112 — WASHINGTON 124 110 115 — LOUISA

DIST. No. 7 = 114; 19 reports   DIST. No. 8 = 109; 18 reports   DIST. No. 9 = 115; 23 reports

MILLS — MONTGOMERY 118 116 116 — ADAMS 110 — UNION 115 100 112 100 — CLARKE 105 — LUCAS 109 109 — MONROE — WAPELLO 120 118 — JEFFERSON 115 120 120 115 — HENRY 120 118

FREMONT 108 116 — PAGE 117 112 — TAYLOR 115 115 115 — RINGGOLD 110 — DECATUR 107 — WAYNE 110 110 — APPANOOSE 110 119 — DAVIS 110 — VAN BUREN 115 110 — LEE 115 115

DES MOINES

TOTAL NUMBER OF REPORTS FOR STATE — 309
STATE PRICE (WEIGHTED AVERAGE OF DISTRICT PRICES) — 112.8
STATE PRICE (SIMPLE AVERAGE OF ALL REPORTS) — 112.5

B A E 47245

FIGURE 35.—Prices received for corn by Iowa farmers, February 1947 (cents per bushel).

due to variations in proportions of total sales represented by the various classes of cattle sold. Reported average prices for beef cattle tend to be greatly influenced by prices received for steers, which usually receive wide publicity. For example, price increases may occur from one month to another in each class and grade of livestock, but if a much higher proportion of the lower-priced classes and grades are sold during the second month, the average price received for all cattle sold may actually be lower than in the preceding month. But many reporters tend to overlook this fact. In the fall and winter months, when the proportion of cows sold increases sharply, a reporter is likely to report a price which follows the price trend of a particular class (frequently steers), rather than the weighted average of all classes.

Supplementary data consisting of reports from most of the United States inspected packing houses become available with about a 30-day lag. These provide very useful information as to the average price of beef cattle purchased for slaughter. Although these reports do not cover all cattle bought, and although a substantial interstate movement limits the use of the data by States, they do provide a useful guide to the United States averages, and in lesser degree, to regional and State averages. Their direct usefulness comes in making annual revisions, as they are not available in time to be used currently. Finally, a series of charts, which reflect the historical relation of the questionnaire data to the final revisions, afford an additional guide to adjustment of reported data on a current basis. None of these methods satisfies the need for a direct sampling approach, however, and because of this the enu-

merative program already described for prices of beef cattle was inaugurated.

In the case of other commodities, similar adjustments must be made. Some of these are made currently. Others can be made only approximately on a current basis, with a more thorough correction at the end of the year if additional information can be obtained. With potatoes and some other commodities, this problem has been partially overcome by having a small list of representative dealers report prices paid to growers by grades, along with the percentage that each grade is of total sales. Check data at the end of the year, collected in conjunction with final utilization reports, help to indicate necessary revisions in prices adopted currently.

INDEX OF PRICES RECEIVED

An index of prices received by farmers is calculated each month to provide a summary indication of the average change in prices from month to month, and to facilitate comparisons over longer periods. This index is a fixed-weight aggregative index, compiled from prices of 48 principal farm products. The price for an individual commodity for a given month is multiplied by its appropriate quantity weight to obtain a value or "aggregate". The total of the aggregates of the commodities forming each group, for example, food grains, is then obtained and divided by the group aggregate for the base period to obtain the group index for a given month. Total aggregates for the group indexes are similarly totaled for all groups, and divided by the total aggregate for the base period to give the all-commodity index.

The base period for the index is August 1909-July 1914. This was originally chosen as representing a period in which prices received by farmers were reasonably stable, and in which the relationship of prices of agricultural commodities to prices of nonagricultural commodities was assumed to be fairly satisfactory. This period has been specified as the base period for many commodities in various laws relating to parity prices that were subsequently enacted.

Quantity weights are derived from the period 1935-39. This was selected as the most recent 5-year period before the serious disturbances immediately preceding World War II. As commodities not produced commercially in the 1909-14 period become more important, and as data become available, they are added to the index.[21]

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[21] A description of the index and the methods of construction are presented in United States Bureau of Agricultural Economics Index Numbers of Prices Received by Farmers, 1910-48, Washington, D. C., 1949. [Processed.]

PRICES PAID BY FARMERS

Definitions.—Estimates of prices paid by farmers reflect the average unit cost of the qualities, grades, and quantities of commodities more commonly bought by farmers. Data are collected from merchants by means of mailed inquiries. For each commodity listed respondents are requested to report prices for the size, grade, and quality more commonly sold to farmers. In general, definite specifications are laid down only for those items for which it is practicable to stratify and weight the sample. Prices of lumber for example, vary to some extent with length, and substantially with species and grade. For this reason, prices are requested for a specified dimension of framing lumber (2×4's) and for specified species and grades of all lumber. Similarly, prices are collected for dairy feeds of different protein contents. On the other hand, questions as to retail prices of rice and many other items are not stratified by kind, grade, or variety, when such factors do not cause sharp differences in prices.

Prices reported are mostly cash quotations, although when sales are customarily made on a credit basis it is probable that credit prices are reported. Except for a few special surveys, there is no measure of the extent to which volume discounts, delivery charges, and other factors affect prices reported.

Most conditions that produce differences in specifications of a given product bought by farmers, in terms of time or location, are reflected in the reports received. Prices of clothing for example, usually are higher in the North than in the South, as heavier clothing ordinarily is worn in cooler climates. Similarly, prices paid by farmers for clothing normally are higher in winter than in summer. Changes in farm income are sometimes mentioned as causing changes in the quality of clothing bought by farmers. However, this relationship is less clearcut than that between actual clothing requirements and average prices paid. During the war, some low-priced lines of work clothes were discontinued by manufacturers when price ceilings went into effect, and many observers reported that the quality deteriorated in higher-priced lines. All of the differences in kinds of clothing stocked on retailer's shelves, presumably are reflected in quotations reported by merchants on average prices paid for kinds of clothing commonly bought by farmers.

In 1949, 175 commodities were included in the index of prices paid by farmers.

Special Problems of Data Collection.—A statistical series is no better than the basic data from which it is estimated. The accuracy and reliability of the prices-paid series depend mainly upon the size and representativeness of re-

turns from the periodic mailed surveys conducted by the State and Washington offices. Ideally, a sample should be drawn at random giving proper representation to different kinds of stores, methods of purchase, geographic and seasonal distribution of purchases, and other factors. This kind of randomness is practically impossible with mailed surveys, as the statistician must depend upon the quotations voluntarily reported. However, a subsample weighting system is often helpful in obtaining indications that best approximate the true averages. Spatial weighting within States should be developed in order to minimize fluctuations due to chance sampling shifts.

Regional and seasonal differences in commodities bought by farmers have been taken into account by varying the questionnaires by regions, and by seasons. In 1949 a total of 12 different series of questionnaires were used to obtain prices from independent and chain stores (see table 5). To meet the requirements of regional and seasonal variation in purchasing habits, a total of 76 different questionnaires are used during the year. The questionnaires are designed to group together those commodities most likely to be handled by the more important types of stores. Thus, cigarettes and tobacco are included on the food questionnaire, as grocers are more likely to handle these items than are the other types of stores circularized. Commodities commonly carried by two types of stores are listed on two questionnaires. For example, kitchen ranges are included on both furniture and equipment questionnaires, kerosene on food and motor supplies questionnaires, etc. Chain-store prices are obtained monthly for items commonly bought at such stores, whereas independent stores are surveyed at the frequency indicated in table 5.

Sampling, Precision, and Bias.—Frequency distributions of prices reported by merchants for such commonly sold commodities as sugar and bran usually resemble the normal distribution. However, in a period of violent price changes, distribution may shift sharply. It may be considerably skewed in the direction of the change, as dealers do not all adjust prices uniformly. Retail price changes lag behind wholesale price changes. The extent of the lag is apparently affected by the rapidity of turnover of the stock.

TABLE 5.—*Prices paid by farmers; Frequency of surveys, regionalization, and seasonality of questionnaires, number of commodities and times reported, independent stores, 1949*

Survey	Times surveyed per year	Number of questionnaires used		Number of commodities					
		Regional	Seasonal		Times reported				
				Total	12	4	3	2	1
Food, tobacco, and household articles.......	4	2	4	74	..	24	2	29	19
Clothing and dry goods.................	4	1	4	89	..	18	14	10	47
Furniture, furnishings, and floor coverings..	4	1	1	28	..	28	..	..	..
Building material, fencing material, fuel, and ice	4	2	2	65	..	50	..	15	..
Equipment and supplies..................	4	3	4	59	..	19	..	19	21
Farm implements and machinery..........	4	3	4	58	..	4	..	19	35
Feed	12	6	3	¹28	21	..	6	..	..
Fertilizer and spray materials [2]............	2	6	2	45	..	..	..	40	5
Retail seed prices......................	4	1	1	43	..	27	8	1	7
Automobile supplies, equipment, and services	4	1	2	16	..	11	1	..	4
Automobiles and motortrucks [3]............	2	1	1	21	..	..	..	21	..
Baby chicks and turkey poults.............	12	1	1	10	10	..	..	..	..
Total	..	28	29	536	31	181	31	154	138
Commodities duplicated	..	..	..	20	..	14	..	..	6
Net total	..	..	..	¹516	31	167	31	154	132

¹ One item reported six times.
² Fertilizer prices are obtained in April and September and spray material prices in April.
³ May be surveyed more frequently if general price changes have occurred.

Many elements contribute to variance in reported prices as of a given date, within a State. Among these are amount of competition between sellers, differences in freight rates from point of manufacture, and differences in quantities usually purchased. In addition to these variations are the geographic differences in buying habits and in quantities and kinds of goods sold to farmers in different States, which cause rather consistent spreads in prices between different localities. The same situation on a smaller scale occurs within a State, although it is not

always so apparent, as with a smaller number of reports sampling errors may be great enough to conceal some of the real differences.

One of the difficulties arising in any type of survey, either mail or interview is that the respondents may place wrong interpretations on the questions asked. One such error in reporting often occurs when items have a uniform retail price f.o.b. the point of manufacture, and freight, taxes, and other charges are added by the retailer when the sale is made. In these cases, prices reported by different dealers for a particular item, such as an automobile or motortruck, are likely to range from the price f.o.b. factory to the price paid for the same item delivered with all handling charges added, plus the cost of such extra equipment as is usually sold to customers in the particular trade area. Under such circumstances, the highest price reported may in fact be most typical of the price actually paid by farmers.

Another difficulty involved in collection of retail prices is that of lags. Much of the variance in reported prices can often be explained by differences in the rapidity with which selling prices are adjusted to changes in wholesale prices. This is highlighted in figure 36, which compares prices paid by farmers for bran in North Carolina and Kansas with wholesale prices at Kansas City during 1947. Prices paid by farmers for bran in Kansas, the center of an area of primary production, are sensitive to changes in wholesale prices. In this case, almost all of the mid-month variations in retail prices may be explained by changes in wholesale prices during the preceding 2 weeks, compared with the same period in the preceding month. In North Carolina, which is far distant from primary production centers, a different situation exists. Retail prices of bran in North Carolina had not fully reflected the March 1947 rise in wholesale prices until mid-April, and by mid-May the reaction to the early April slump was only minor. Later adjustments to wholesale price changes were minor, but tendency to follow a smooth upward trend in line with the longer-time movement of wholesale prices was marked.

Prices paid by farmers for items sold in a variety of grades or qualities are usually reported over a relatively wide range. In some States the reports on 20-percent-protein dairy feed form a distinct bimodal pattern, with feed mixed from ingredients with a high percentage of digestible nutrients selling at a price about that for 18-percent feed. If other ingredients with a relatively low total digestible nutrient content are used, another 20-percent-protein feed is manufactured which contains perhaps even less digestible nutrients than a high-grade 18-percent-protein feed. In editing, a statisti-
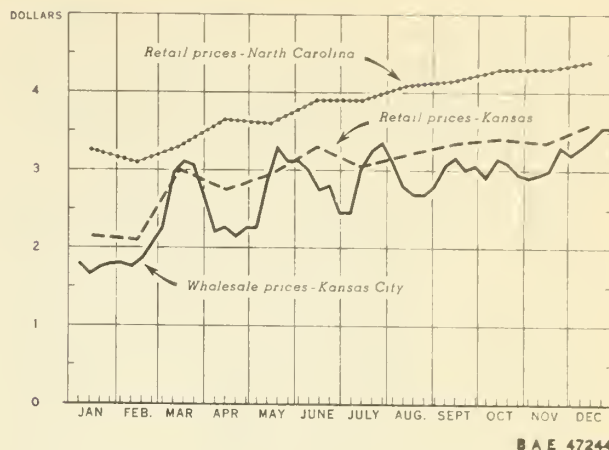
FIGURE 36.—Price of bran per 100 pounds, 1947.

cian must be alert to detect and appraise such departures from the usual. His training must be thorough, to enable him to interpret the returns with respect to their representativeness of prices within the State.

As a substantial proportion of farmers' purchases are selected from catalogues, it is desirable to have series of prices charged by mail-order firms. Although unpublished, these series are maintained in the Washington office. They are based on prices quoted in semiannual catalogues issued by the larger companies, supplemented with prices from the special sales catalogues normally issued in the summer and winter of each year.

Construction of Indexes.—Index numbers of prices paid by farmers are computed by a modified constant weight aggregative method in which subgroup indexes are computed and combined into a general index of the retail price level, using fixed percentage weights. Each national average estimate of commodity prices is multiplied by a constant weight, which is based on an estimate of average purchases of that commodity by farmers in the weight period, 1924-29. The sum of the aggregates currently so derived for each group of commodities is divided by the corresponding base aggregate (1910-14 average) to obtain index numbers for the several sub-groups. The sub-group indexes of family-living commodities are weighted by estimated expenditures of farmers for all commodities in each sub-group, expressed as a percentage of total expenditures for commodities used for living, to obtain the family-living index.

A similar process is followed in computing the index of prices paid for commodities used in production. The two indexes are then combined by weighting each by the percentage weights proportional to expenditures by farm-

ers for items in the corresponding groups during the 5 years 1924-29. Indexes of interest payable per acre on farm mortgage debt and real estate taxes payable per acre are weighted with the combined commodity price index to derive the index of prices paid, interest, and taxes.

All sub-indexes are based on commodity price averages for a 5-year pre-World War I period (1910-14 = 100) except the sub-index for seeds, which has a 1912-14 base. As prices are not available for all commodities in the index as far back as the 1910-14 base period, offset adjustments have been made in the base-period aggregates in computing the indexes, whenever new commodities are introduced after the base period. Base-period prices were derived on the assumption that the price at the time a new commodity was introduced stood at the same level in relation to 1910-14 as did the subgroup index to which it was added. As an example, suppose that a certain commodity was introduced into the food sub-index in March 1927; that the price of the commodity on that date was 18 cents a pound; that the purchases averaged 20 pounds per farm family per year; and that the food index was 150. Under such assumptions the base period aggregate for the commodity would be derived as follows:

$$\frac{\$0.18 \times 20}{1.50} = \$2.40.$$

This derived or estimated value in the 1910-14 period, when added to the original base-period aggregate, provides a new "divisor" which is comparable, in terms of the number of commodities, with the current aggregates. This makes it possible for the influence of changes in the price of the new commodity to be reflected in the general price level for food subsequent to its introduction.

Whenever one grade or quality of a commodity is substituted for another grade or quality of the same commodity, another kind of adjustment is made. This is accomplished by adjusting the weight in inverse proportion to the differences between prices of the old and the new items. As an example, suppose that a grade of fertilizer worth $30 a ton is to be substituted for a grade worth $24 a ton on some specific date. The weight assigned the former price is assumed to be 0.5 tons. The following computation would be made: $\frac{\$24 \times .5T}{\$30} = .4T$. This computation maintains the aggregate value of the old grade on the date of linkage, and permits the new and more commonly sold grade to reflect price changes from that date forward.

Obtaining information for use as commodity and group-index weights is one of the problems in constructing an index of prices paid by farmers. The weights in use in 1949 represent average annual purchases per farm during the period 1924-29. Surveys of quantities of specific items bought by farmers and of expenditures for groups of commodities used in family living have been made at infrequent intervals. Such surveys are not available on a Nation-wide scale for most commodities used in production. Necessarily, then, the weights must rest on approximations from other data. Census information as to domestic sales of farm machinery by manufacturers to dealers is an example of the type of indication of the volume of purchases by farmers that must be used in constructing tables of weights when information as to actual purchases by farmers is not available.

The reliability and accuracy of a price index depend mainly upon the accuracy of the prices reported, the accuracy of the weights with which they are combined, the representativeness of the commodities included, and the number of items used. Published price series and indexes are based on the quarterly reports from independent stores as indicated above, with chain-store reports used for estimating price changes in the inter-quarterly months.

Revisions of the prices-paid index are sometimes necessary when inter-quarterly estimates based on a sample of returns from chain stores do not approximate the same degree of change as does the large sample of quarterly returns from independent stores. Indexes of interest and taxes are also subject to revisions as preliminary data are replaced by more complete information and as new census bench marks are established at quinquennial intervals. Work upon revision of the index is now in progress. Among the improvements which are under consideration and development are introduction of more current weights and extension of coverage, both by increasing the number of individual commodities within groups and by adding groups not heretofore included. These groups include (1) feeder livestock, replacement stock, baby chicks, and turkey poults and (2) medical, dental, telephone, electric, and personal services.

By PAUL P. WALLRABENSTEIN

ESTIMATES OF FARM EMPLOYMENT

The present series of farm-employment estimates of the Bureau of Agricultural Economics was prepared in 1948 and released in 1949. It supersedes the old series which was first published in 1938 [22] for the period 1909-36 and carried forward through 1948. The current series differs from the old series in the definition of farm employment, the method of setting up factors to adjust for bias, and the bench marks used.

Estimates of farm employment as published monthly show numbers of farm operators and unpaid members of their families, numbers of hired workers, total number employed, and indexes of employment for each component of the series during a specific week. Indexes are adjusted for seasonal variation. Farm employment is defined to include employment on all farms that meet the census definition irrespective of the amount of time the operator spends working elsewhere. Counted as working during the survey week are: (1) All operators who do any work at all; (2) all hired workers who work 1 hour or more for pay; and (3) all unpaid family members who work 15 or more hours.

Basic data used to make the monthly estimates of farm employment are collected by mail from crop reports on the "monthly general schedule." They are processed in the usual way in the offices of the State Statisticians except that the State Statisticians are not at present required to make any recommendations. In the Washington office, reported averages per farm are adjusted for bias by using a set of previously established adjustment factors, one for each month for each geographic region. Adjusted averages per farm are multiplied by an estimated number of farms to arrive at the number of persons employed in each region. State estimates are prepared in the same way, but because the accuracy of such estimates has not been established, they have not been published.

Conversion to absolute estimates of numbers of workers on all farms in the United States is difficult for two reasons. Crop reporters and their farms are not representative of all farm-

ers and all farms. Not only are crop-reporter farms likely to be larger and better equipped than average, but general crop and livestock farms tend to be overrepresented, as most of the questions on the general schedule relate to field crops and livestock items. Specialized growers of fruit, vegetables, and all sorts of specialties are likely to be badly underrepresented or not represented at all in some States.

As a result of this lack of representativeness on the part of the sample, employment per reporting farm is generally at a higher level than is employment per farm for all farms. When large numbers of sharecroppers are at work during cotton chopping and cotton picking times, the tendency of plantation operators to report all sharecroppers on the plantation exaggerates the average number per farm.

The seasonal pattern of employment also differs somewhat on reporting farms from that on all farms. Reporting farms more often employ workers during the entire year and usually they report smaller fluctuations in number of hired farm workers than would all farms. For instance, dairy farms, which are probably adequately represented in the sample, have much more stable labor requirements throughout the year than do commercial potato or celery farms, neither of which are adequately represented.

Adjustment factors used to correct reported averages per farm were derived by a rather complicated process. For the current series, data from five Nation-wide interview surveys, which are mentioned later, were the starting point for computing adjustment factors. Absolute estimates of family employment (operators and unpaid family members), hired employment, and total employment were prepared for the survey weeks in March, May, and September 1945, July 1946, and January 1947, by regions. These estimates were converted to estimates for the same months in 1944 on the basis of year-to-year changes in reported averages per farm. Regional estimates for 1944 were then plotted on charts. Data on monthly labor requirements were also plotted on the same charts. Estimates of labor requirements, which are in man-days units, were converted to persons by using data from interview surveys on hours worked per day by different kinds of workers in different seasons of the year.

Smooth curves were then drawn through the estimates of employment for the five survey dates, with the labor-requirements curve used

[22] Techniques used in preparing the old series may be found in Shaw, Eldon E., and Hopkins, John A., U. S. Works Prog. Admin., Natl. Research Project, Report No. A-8, Trends in Employment in Agriculture, 1909-36, 1938.

as a guide for interpolation between the survey dates. Estimates were then read from the curve for the weeks that coincided with the general crop-reporter survey dates.

These estimates of monthly employment were then divided by the estimated number of farms in 1944 to obtain averages per farm. The averages per farm derived from the 1944 estimates were divided by the reported averages per farm for 1944. This process gave the adjustment factors which are used in the preparation of current estimates.

Adjustment factors used in preparing State estimates were similarly prepared. State estimates for the survey dates were adjusted when necessary so that the sum for the States in a region would equal the regional total previously obtained. Instead of using the reported averages for 1944 in the final step of dividing averages per farm of the estimates by reported averages, an average of the 1943, 1944 and 1945 reported averages for each State was used as the divisor. As State averages tend to have a greater variability than regional averages, this process tended to smooth sample fluctuations.

Interview surveys of April and September 1948 are to be used to check estimates for those months in 1948. If these surveys indicate changes in biases, revisions in the series and changes in adjustment factors will be made on the basis of the newer data. Interview surveys at rather frequent intervals are desirable as a check on current estimates.

FARM WAGE RATES

Statistics relating to wage rates in Agriculture in the United States date back to 1866. In that year the Department of Agriculture made its first survey of average wage rates paid to hired farm workers. Mail questionnaires addressed to its crop correspondents were used. Early wage-rate surveys were not made at regular intervals. In the period 1866 through 1908, 19 surveys were made. Annual surveys were made from 1909 to 1923. From 1923 to date wage-rate information has been collected quarterly, on January 1, April 1, July 1, and October 1.

Wage rates from 1866 through 1948 were for four types of rates: Per month with board, per month without board, per day with board, and per day without board. Beginning in 1948 the wage-rate series was changed to include more different kinds of rates and to more clearly specify perquisites received in addition to cash wages. The types of rates now asked are as follows: Per month with board and room, per month with house (no meals), per week with board and room, per week without board

or room, per day with board and room, per day with house (no meals), per day without board or room, per hour with house (no meals), and per hour without board or room.

These new types of wage rates are carried on the general schedule, as were the old rates. Reporters are asked to report "average rates being paid to hired farm labor in your locality." Not all rates are asked in all parts of the country as the importance of various rates varies by regions. As many as six different rates are asked in some areas; in others as few as three are required to cover wage rates paid to most hired farm workers. All rates are published for the United States, but only those rates which are of major importance are published for individual States and regions. In addition to individual rates, a "composite" which is an average of all rates, converted to an hourly basis, is published. The composite rate is the basis for the index of farm wage rates. Annual average rates are also prepared by States.

Wage rates reported by farmers are summarized in the offices of the State Statisticians and are forwarded to Washington together with the Statisticians' recommendations. State averages are reviewed in Washington and when reports for individual States depart materially from general trends or changes shown by nearby States with similar conditions, adjustments are made.

Summarization of State average wage rates consists of two processes:

1. The computation of regional and United States averages, which are weighted averages. Hired employment estimates are used for weights. Each individual type of wage rate is weighted by an estimate of the number of workers receiving that type of rate. Interview surveys are the source of percentages of workers, by regions, employed at each of the different types of rates during each season of the year. Before the regional averages can be combined to obtain a United States average, estimates of certain rates must be made, as not all rates are asked in all regions. These estimates are based on the relationship between the rate to be estimated and the most nearly similar rate in regions in which both rates are reported.

2. Calculation of the composite rates. The first step is the estimation of rates not reported for individual States. This estimate is made in the same way as that for the regional rates which are not reported, using relationships between regions. Next, monthly, weekly, and daily rates are converted to hourly equivalents. Conversion factors are the number of hours per month, week, or day put in by hired farm workers who are paid each specific rate that is converted. Interview surveys furnish the data

for use in preparing conversion factors. When wage rates other than hourly rates are converted to hourly equivalents, all rates are weighted together by the estimated number of workers receiving each type of rate. This process gives the hourly composite rate.

As data on wage rates are for the first of the month, to prepare annual averages it is necessary to weight the wage rates to center on July 1, the midpoint of the calendar year. To do this, January current rates are weighted by half of December employment plus that of January; April rates are weighted by February, March, and April employment; and so on through October. Wage rates for January 1 of the following year are weighted by employment for November and half of the December employment.

In addition to the regular series of wage rates, rates for picking 100 pounds of seed cotton have been collected since 1924. Cotton reporters are asked to give estimates for their locality of average rates paid for picking and for snapping or pulling cotton up to November 1. These data are summarized in the State offices. In Washington, snapping and pulling rates are converted to picking rates and the reported and derived rates are reviewed for reasonableness and then published. Custom harvest rates for other major crops have also been collected intermittently from general crop reporters.

LENGTH OF FARM WORKDAY

Data as to length of the farm workday for farm operators and for hired farm workers have been published at quarterly intervals since 1944, beginning on March 1. The first survey was made for September 1, 1939, but following surveys were made at irregular intervals until 1944. Two questions are carried on the general crop questionnaire, immediately following the employment questions. These ask for average hours worked per day by operators and by hired workers.

As no check data or no measure of any bias that may be in the reported data are available, reported State averages are accepted after a check for reasonableness. Regional and United States averages are weighted averages. Hours worked by farm operators are weighted by the number of farms, and hours worked by hired help are weighted by the estimated number of hired farm workers on the same date.

INTERVIEW SURVEYS

In 1945, the Bureau of Agricultural Economics began to make a number of Nation-wide interview surveys covering farm labor. Surveys were made in March, May, and September 1945, July 1946, January 1947, and April and September 1948. In 1945 and 1946 the surveys covered a preselected sample of about 20,000 farms in 158 counties and they were devoted entirely to farm wages and employment. The January 1947 and April 1948 surveys used a general-purpose sample of about 16,000 farms in about 800 counties. In these surveys, farm wages and employment were only two of a list of subjects. In September 1948 about 10,000 farms in about 400 counties were used to obtain information on farm wages and employment and farm accidents.

In these surveys, in contrast to previous farm-wage statistics, farmers were asked wage and related information for each hired worker employed on his farm during the reporting week. As the farmer is reporting on something which has actually occurred on his own farm, more accurate information is obtained in this way. Information was obtained as to wage rates, time worked, and cash wages received during the reporting week, together with information relating to worker characteristics such as age, sex, race, type of work, duration of employment, and also on certain farm characteristics. This type of information permits the conversion of any type of rate into hourly or daily equivalent cash earnings; it also permits comparisons of earnings, wage rates, and time worked, with worker and farm characteristics.

Information concerning employment of farm operators and unpaid members of their families was obtained at the time data were collected on hired farm workers. In the first two surveys in 1945, respondents were asked the number of persons working two or more days during the week. Separate columns were provided for operators and for unpaid family members. In September 1945 and July 1946, the concepts of farm employment adopted for the revisions made in 1948 were used. Respondents were asked the number of hours worked by the operator and the number of other family members working less than 15 hours, also the number working 15 hours or more. Each group was broken by age into "under 14" and "14 and over." In the 1947 and 1948 surveys, information on time worked at unpaid farm work was asked for each individual in the operator's household.

General reports on wages and wage rates of hired farm workers for the surveys made in 1945, 1946, and 1947 have been released in the Bureau of Agricultural Economics' series of publications, "Wages and Wage Rates in Agriculture." Several analytical reports have also been released in this series. The 1948 surveys are now (in the spring of 1949) being processed in preparation for publication.

CHAPTER 17. INTERVIEW SURVEYS

By Emerson M. Brooks

Interview surveys, in which respondents are interviewed to obtain economic information, play an increasingly important part in the work of the Bureau of Agricultural Economics. It is not envisioned, however, that they will replace the mailed inquiry which has been the backbone of the statistical work of the Bureau. It would not be possible to maintain a crop-reporting service of the size and scope of the present program without the use of mailed inquiries. The Bureau has been using enumerative surveys to obtain agricultural data that cannot be obtained satisfactorily by mail, and to provide bench-mark information for use in adjusting for bias indications from mail surveys.

Interview surveys are useful because they (1) provide the only means of obtaining adequate information on certain subject matters, (2) obtain information from certain groups of people who either cannot or will not respond to mailed inquiries, and (3) are "self-sufficient" in that estimates may be made from the sample data with a minimum of outside information.

A primary function of the interview surveys has been to furnish information on the interrelationships among such things as size of farms, types of farms, level of income and expenditures, amount of machinery, tenure, farm labor and wages, numbers of livestock, acres in crops, and crop yields.

The Bureau experimented with interview surveys as early as 1938 and 1939 in Iowa. In 1945, four Nation-wide interview surveys, each covering about 3,000 farms, were made to obtain data on a wide range of economic subjects. Also, three Nation-wide interview surveys were made in 1945 and one in 1946, in addition to 60 "spot" surveys, to obtain information on farm employment and wages. Since January 1947, three large-scale Nation-wide interview surveys have been made by the Bureau of Agricultural Economics. These were made in January 1947, and in April and September 1948.

The 1947 survey included interviews with 14,468 farmers in 814 counties throughout the 48 States. The questionnaire carried a total of 258 questions on 13 topics: Accidents to farm people, farm acreage, price of farms, farm population, farm employment and wages, livestock numbers, farm tractors, crops on hand, value of farm products sold, farm expenses, family living expenses, other income of members of household, and operator's dwelling facilities.

In the April 1948 survey, a different group of about 11,000 farmers was visited in each of the same 814 counties that had been used in the January survey. These 15 topics were covered: Farm acreage and tenure, tenure practices, grain and hay stocks and 1947 grain production, crop acreages, livestock and poultry, farm power and machinery, financing of farm machinery and equipment, farm population and family employment, hired farm employment and wages, accidents to people living or working on the farm, sickness of farm operator, fire damage, marketing channels and transportation methods, farm construction, and commercial fertilizer.

Budgetary limitations restricted the September survey to two topics—farm employment and wages and accidents to people living or working on farms. Interviews were obtained from 9,883 farmers in 427 of the original 814 counties.

These surveys obtained a great deal of information that is difficult to get by mail. For example, the data on farm accidents, marketing channels, and transportation methods are unique in their fields. This chapter discusses, at the process level, actual problems involved in planning and operating large-scale interview surveys.

PLANNING A NATION-WIDE INTERVIEW SURVEY

An interview survey, like a sturdy work table, stands on four legs. These are: Design of the sample, construction of the questionnaire, work of the interviewers, and analysis of the data. The end product—the published results—is only as strong as the weakest of the four legs. As there are about 6 million farms in the United States and only 10 or 15 thousand have been included in any one sample, it is obvious that an interview survey must be a precision instrument. This means that every phase of the project must be carefully planned and faithfully executed.

Initial decisions include determination of the budget, approximate number of farms to be visited, number of counties to be included in the sample, and approximate date the survey is to be made. Once these decisions have been reached, an interview survey goes through some 16 stages: (1) Determination of subject matter to be included in the survey, (2) design of and drawing of the sample, (3) preparation of a timetable of operations, (4) design of ques-

tionnaire, (5) pretest of questionnaire and procedures, (6) preparation of instructions for interviewers, (7) duplication of questionnaires, instructions, field forms, etc., (8) distribution of materials to the field, (9) training of State supervisors, (10) locating and hiring interviewers, (11) training of interviewers, (12) interviewing, including supervision of interviewers, (13) editing and coding of questionnaires, (14) tabulation and summarization of data, (15) analysis of data and expansion of the sample, (16) publication of results. All of these cannot be discussed in detail here, but consideration is given to some of the more important problems.

DETERMINATION OF SUBJECT MATTER

Experience in connection with these interview surveys has shown clearly that no question should be included in a survey unless the sponsor for the item can fully demonstrate (1) exactly what is needed, (2) how it will be used, especially, the plans for tabulation and analysis, (3) why it is needed, that is, who will use it or benefit from its use?, (4) frequency of need of the data, and (5) appropriate dates for collection.

If the person sponsoring a topic cannot give definite and reasonable answers to these questions, the proposal does not warrant serious consideration. This information is needed not only to decide on subjects to be included, but also to decide on the size and type of sample, to draft the questionnaire, to plan operations, and to train the field organization.

DESIGN AND DRAWING OF THE SAMPLE

For these surveys, an area sample was used; that is, interviewers visited all the farms that had "headquarters" inside the boundaries of selected segments in a specified number of counties. In drawing the sample, three steps were necessary:

1. Deciding the number of counties to be included and the method of selecting them. For the January 1947 and April 1948 surveys, 814 counties were used. Briefly, the sample of counties was selected by dividing all counties in the United States into 408 groups or strata on the basis of the most recent Bureau of Agricultural Economics generalized type-of-farming areas, with about an equal number of sample farms in each group. Except for those in the Mountain States and the New England States, each State was handled independently. Usually a group was divided into approximately equal parts and one county was selected from each at random, with probabilities proportional to the number of farms.

2. Selecting the segments within the sample

counties. For the Bureau surveys the master-sample segments were utilized, but as there are some 60,000 of these and only about 4,000 segments were needed, a random selection of the desired number was made in each county.

3. Selecting the farms within the segments. To give each farm a known chance of being in the sample, it is necessary to specify a single point or place for use in making this determination. This is referred to as the farm headquarters and if it is inside the boundaries of a sample segment, an interview is to be obtained. Interviewers are provided with county maps showing the location of the sample segments and with aerial photographs on which they trace the boundaries of each tract of land inside the segments; they then establish by specific rules the headquarters of each farm that has any land inside a sample segment. If the farm operator lives on his farm his residence is the headquarters, but if he does not live on his farm one of the following places, in the order given, is considered to be the farm headquarters: (1) The most valuable dwelling, either occupied or unoccupied, (2) the most valuable building, (3) the main entrance to the farm, (4) the northwest corner of the farm.

It may be seen that every county and every segment or area of land—hence, every farm—has a chance of being in the sample regardless of its size or type of agriculture. This procedure is statistically sound and it can be applied with satisfactory results.

In the January survey about a third of the segments were designated for a complete clean-up; that is, interviewers were to make a resolute effort to get an interview with every eligible farm operator in these segments. The theory was that the data obtained by a complete coverage of farms in about a third of the segments would provide a basis for estimating the bias for incomplete enumeration of the remaining segments. This procedure did not work as well as expected because it was impossible to get 100-percent coverage of the clean-up segments. Therefore, it was not used in later surveys. Moreover, the cost was rather high because of the excessive time and mileage expense of making the numerous return calls in the clean-up segments.

For the April survey, the same counties were used so that desirable previous interviewers could be re-hired. New segments were selected in order to avoid over-burdening respondents and to provide additional names for later mailed inquiries.

In addition to the area sample, the so-called "large farms" were handled separately in the 17 Western States for the April and September 1948 surveys. This is a relatively small but

very important group of farms with operations of such magnitude that statistical efficiency is increased if they are sampled at a heavier rate than other farms. In the April and September surveys for the Western States, where the area sample was rather small, a list of farms that met the 1945 Census criteria for large farms were sampled at the rate of 0.02; and to these were added any farms included in the area sample which satisfied the large-farm criteria.

The unit of observation must be clearly defined and rigidly adhered to if the results of an interview survey are to obtain their maximum usefulness. The Census Bureau definition of a farm was used in the interview surveys, as the sample was stratified on this basis, and data for "census farms" were needed to expand the sample data, analyze the results, and for the general public to interpret the published material. A census farm is all the land handled as a unit on which a person carries on agricultural operations with the aid of his family and hired workers, provided either that his place consists of 3 acres or more or the value of production the previous year amounted to $250 or more. This concept of a farm is rather complex and it is difficult to apply in field operations, but it is the best available and it does have the virtue of long use and general acceptance.

It is apparent that the sampling procedure used was complicated and that the interviewers had to do their job well if the results were to be satisfactory. Their success in identifying sample farms as compared with the expected number of farms in the segments (based on Census data) and in obtaining interviews from eligible farmers is indicated in table 6.

TABLE 6.—*Expected number of farms compared with number of farms identified and number of interviews completed*

Item	Jan. 1947 survey	April 1948 survey	Sept. 1948 survey
	Number	*Number*	*Number*
Expected farms [1]	19,756	12,917	[2]7,815
Farms identified	17,704	12,563	7,165
Interviews completed..	14,468	11,395	6,666
	Percent	*Percent*	*Percent*
Identified as percentage of expected	89	97	92
Interviews as percentage of identified....	82	91	93

[1] Based on 1945 Census number of farms.
[2] A total of 9,883 interviews was obtained, but the September survey figures reported here are based on only the new segments used in this survey.

The relatively low figures for the January 1947 survey, compared with those for the April survey, were due to many factors. Supervisors as well as interviewers were inexperienced. The weather was severe, roads were bad, and many farmers could not be reached because they were not on their farms during the winter. Because of excessive snow or prolonged floods, 73 segments could not be reached at all. It has been estimated that under average conditions 500,-000 farms in the United States cannot be visited during the winter because of impassible roads. In planning the date of a farm survey this should be given definite consideration.

Data in table 6 show that only 92 percent of the "expected" number of farms were identified in the new segments used in September, compared with 97 percent in April. It is believed that the reason for the decrease is that training schools for interviewers at which the importance of farm identification would have been stressed, were not held in September. Moreover, interviewers were not given the close supervision during the survey that they had been given in April.

Although the field procedure is difficult it appears that part-time interviewers can grasp the essentials of area sampling and can do the work satisfactorily if they have adequate supervision during the early stages of the survey.

PREPARATION OF TIMETABLE OF OPERATIONS

Successful planning for a large-scale survey requires both time and timing. To assure adequate time for the performance of each phase in the operation of a survey, preparation of a timetable is essential. Approximate time required for each of the more important phases of surveys on the scale of those discussed is as follows: Initial draft of questionnaire 4 weeks, clearance within the Bureau of Agricultural Economics 1, approval of Budget Bureau for pretest 1, duplication of pretest questionnaire 1, field pretest 2, re-draft for submission to Budget Bureau 1, Budget Bureau clearance 3, reproduction of schedules and instructions 2, distribution to field offices 1, regional training schools for State supervisors 4, and State training schools for enumerators 2, making a total of 22 weeks. It is assumed that the work of drawing the sample, writing detailed instructions for interviewers, preparing maps and aerial photographs, preparing time, mileage and other field forms, planning training techniques and material, locating and hiring interviewers, and doing the numerous other jobs can be accomplished during the time periods indicated.

DESIGN OF QUESTIONNAIRE

Although it is inanimate, a good questionnaire has a positive personality—a character-

istic that is essential to counteract the individual characteristics of the interviewers, and to make it possible for the thousands of respondents to give comparable answers to the questions. Further, a well-designed questionnaire simplifies and speeds up the interviewing as well as the editing, coding, tabulation, and analysis.

There are two general types of questionnaires: the "record type" and the "interview type." In the latter, each question is stated exactly as the interviewer is to ask it; in the former, the significant words or question objectives are provided for the interviewer to use in forming his own questions. Experience in these surveys supports the growing conviction that better results are achieved with an interview-type questionnaire than with a record-type. The 1950 Agricultural Census questionnaire will be largely the interview type.

The questions should be formulated in simple language, with few words, and in terms that are readily understood by respondents.

The use of "screening questions" that may be answered "yes" or "no" provides a time-saving technique for passing over groups of questions that are not applicable in a particular interview. Such items as size, shape, and color of the paper on which the questionnaire is printed and the use of a ring notebook for the convenience of the interviewer affect the interviewing situation and, therefore, the quality of information collected.

Following are a few principles of questionnaire design based on experience with these surveys: (1) Use short questions, each with only one objective, (2)·use clear and simple terms, (3) avoid questions that refer to periods too long for recollection, (4) avoid asking for percentages if absolute numbers can be obtained, (5) keep the average interviewing time under 1 hour, (6) use the best paper that can be afforded, (7) use a printed questionnaire with large type, (8) provide adequate space for recording answers, (9) leave ample white space in margins and elsewhere for interviewer notes.

PRETEST OF QUESTIONNAIRE AND PROCEDURES

No questionnaire can be considered ready for use in a survey until it has been tested, together with the field procedures, under conditions approximating the actual survey situation.

The pretests should be carefully planned with special attention given to these factors: (1) Location—counties or areas which provide tests of particular problems should be chosen; (2) personnel—including a subject-matter specialist, a sampling expert, an analyst, an operations man, a supervisor, and a number of typical interviewers; (3) supplies—maps, aerial photo-graphs, schedules, instructions, field forms, etc., that will be used in the full-scale enumerations should be given a trial in the pretest; (4) interviewing—both single and double. Double interviewing means that one person does the interviewing while another observes and takes notes on any phase of the questionnaire or the interviewing.

One of the complex situations with which interviewers have had to deal is that of "multiple-unit" farms, or farms with sharecroppers, in the South. In actual practice these are, for the most part, simply large farms on which the work is done by individuals, or sharecroppers, who receive a share of the crop and various perquisites in lieu of wages. Because it has been customary procedure of the Bureau of the Census to consider sharecroppers as independent farmers, it is difficult to devise a way that will obtain both information for the multiple-unit as a whole and information on sharecropper operations in a form that will permit them to be segregated and treated as separate farms.

To illustrate:

	Acres
Suppose that John Jones owns	1,000
and that he rents from others	500
Making a total of	1,500
Of this he rents out to two bonafide renters	200
Leaving him to operate with his family, hired workers, and croppers	1,300
Of this 1,300 acres, 50 croppers have	500
Leaving him to operate with his family and hired workers	800

According to the census definition, the total 1,500 acres consists of 53 farms, or 53 farm operators—the two bona fide renters, the 50 sharecroppers, and John Jones, who is considered the operator of the "home farm" of 800 acres. In practice, however, the specified 1,300 acres is usually operated as one farm—Mr. Jones makes the decisions as to what and when to plant, when to cultivate, when to harvest, and when to sell. Opinions differ as to what should be considered the "farm" for interview purposes. Some think the entire 1,500 acres should be considered the farm; others think it is the 1,300 acres; still others prefer the 53-farm idea.

In the January 1947 survey the headquarters of the 1,300-acre unit was decided upon, and if the headquarters was inside a sample segment, a schedule was obtained from Mr. Jones for the 800-acre home farm and for a sample of the 50 sharecroppers. This meant that sharecroppers who lived inside a segment, but were not associated with a multiple-unit with headquarters inside the segment, were not interviewed. Conversely, sharecroppers who lived outside a

sample segment, but were associated with a multiple-unit with headquarters inside the segment, were interviewed.

In the April 1948 survey the interviewers were instructed to obtain a complete schedule for each census farm with headquarters inside a sample segment.

TRAINING STATE SUPERVISORS

Regional training schools for supervisors achieve a meeting of minds between study directors and supervisors, who are the only personal link between the survey planners and the interviewers. The most successful method of training supervisors is to establish a pattern in their training schools that they can in turn follow in the State training sessions for interviewers. This gives greater promise that the specific questions which the supervisors will have to face later will be discussed in the regional training schools. A combination of explanation, demonstration, and actual practice, with emphasis on practice, has been found profitable in training both supervisors and interviewers.

For the January and April surveys, area training schools for State supervisors were held in Columbus, Ohio; Salt Lake City, Utah; and Montgomery, Alabama. For the first survey, the schools lasted 5 days each; for the second, they were limited to 3 days. As the subject matter for the September survey was rather similar to that of the April survey, no area training schools were held.

The program for the 1947 schools for supervisors follows: The first day was spent in general background discussions. Topics covered were survey methods, techniques for establishing rapport, use of maps and aerial photographs, scope and objectives of the survey, and highlights of the questionnaire and interviewer instructions.

On the second day, half of the group went to the field for practice interviews under conditions approximating the actual interview situation, including the use of maps, aerial photographs, etc. The remainder made recorded interviews with farmers at a central location. These recorded interviews were played back so that the adequacy of the interviewing and any weaknesses in the construction of the questionnaire could be studied. During the third day the second day's procedure was followed, with the two groups reversed.

The fourth day was devoted to discussions of the experience with practice interviews in the field, appraisal of the recorded interviews, and explanation of the sample design and its operation in the field. The fifth day was used in explaining methods of hiring interviewers, reviewing the job to be done in each State, and describing the way the data would be handled in Washington—including editing, coding, machine tabulation, and methods of expansion.

Area training schools are an indispensable part of every successful Nation-wide survey, unless the subject matter and field procedures have been used in a recent survey so that the supervisors are thoroughly familiar with them.

Supervisors should have an opportunity to study the questionnaire and instructions carefully and to take some practice interviews before they come to the training school. This makes training more effective and reduces the number of days needed for the schools.

LOCATING AND HIRING INTERVIEWERS

Interviewers can make or break a survey not only from the point of view of public reaction, but also with respect to the adequacy of the data collected. The sample may be statistically perfect, the questionnaire well designed, the supervision excellent, and the analyses skillfully made, but if the interviewers have done a poor job the results of the survey will not be satisfactory. This makes the task of the State supervisors in locating and hiring interviewers especially important. Usually supervisors sent letters to county agricultural agents or other influential people in the sample counties, telling about the forthcoming survey and asking for recommendations of people who might make good interviewers. The supervisors then made a trip through the State to interview the people who had been recommended and to search out others who were needed. Copies of the questionnaire and instructions were left with prospective interviewers for study and practice before they attended a training school.

Ages, previous interviewing experience, educational background, and general qualifications of the interviewers varied widely. On analyzing the personnel forms for the 453 interviewers in January 1947 it was found that 91 percent were men, 60 percent were between 30 and 60 years old, 45 percent had been graduated from high school, 24 percent had attended college, and only 23 percent had had previous interviewing experience.

A rating of the interviewers' work indicated that in general women do better work than men, people with farm experience excel those without it and young people are somewhat superior to older people. Perhaps this means that the type of person who makes the best interviewer in surveys of this kind is a farmer's daughter under 30 years old with a college education. A farmer's daughter has a knowledge of farm practices and terms that helps in interviewing; being young, she can better stand the strains

of the work; her college study aids her in grasping the objectives of the survey and the details of the procedures, and as a woman, she usually has an advantage in gaining courteous and helpful acceptance by the respondents.

TRAINING INTERVIEWERS

Training of interviewers must be carefully planned and effectively carried out to insure a successful survey. The number of interviewers attending a school should be held to 10 or less, because in larger groups some may be reluctant to take part in the discussions and the supervisor cannot give the individual much attention. In cases in which interviewers are located in widely separated parts of a State it has been necessary to train on an individual basis, but training in groups is preferable. In either case the content of the training should be the same, with maximum application of the sound principle that one learns better by "doing" than by being "talked to". Fully half of the instruction time should be devoted to practice interviewing, both within the classroom group and with actual farmers on their farms, and to identifying sample area segments, determining farm headquarters, and completing identification of farms for which interviews are to be obtained. A 3-day school is none too long to impress on interviewers the importance of their work and their responsibility as government employees, to explain the objectives of the survey, the sample, the questionnaire and field procedures, and to train the interviewers in the skills necessary for successful completion of their work.

SUPERVISION OF INTERVIEWERS

Interviewer supervision should follow the training schools. At the close of the schools it is desirable for the supervisors to rate the interviewers somewhat as follows: (1) Good—requiring a minimum of supervision, (2) average—requiring additional training and supervision during the first few days of the survey, (3) fair—requiring substantial additional training and supervision; in some cases these should be held over for an extra day's training; or given "on-job" training and supervision immediately preceding and during the first day of the survey, (4) not usable—need to be replaced, (5) absentees—unable to attend; these must be trained individually by the supervisors after the close of the schools.

The supervisors' itineraries should be planned to enable them to work with the interviewers in accordance with their need for additional training. Interviewers should be instructed to take some practice interviews in their neighborhoods before the starting date of the actual survey. This work should be reviewed by the supervisor and any questions answered or corrections explained. This procedure provides a last-minute check and a vehicle for additional supervision. In addition, interviewers should be given some on-the-job supervision during the survey.

PROCESSING SCHEDULES AND ANALYSIS OF DATA

The magnitude and variety of the analyses which are generally made of the interview survey data make it feasible to use punched card machine tabulation methods. Before data are punched, careful review of completed questionnaires is necessary on the part of the interviewer, the State supervisor, and the central agency which does the coding and machine tabulation. At State and local levels the personnel have a knowledge of local customs, practices, and terms that is valuable in editing the returned filled-in questionnaires. Review of the editing by the central agency assures greater comparability. Coding in State offices has been attempted, but because all of the problems cannot be anticipated it is usually preferable to have the coding centralized.

INTERVIEW SURVEY COSTS

Generally speaking, any interview survey will cost more on a per schedule basis than will a mailed survey of the same size of sample. It is necessary, therefore, to take into consideration the value of the kind of data obtained, the greater amount of information obtained, and the types of analyses that can be made which are not possible with returns from a mailed inquiry. In short, if interview surveys are to be worth the time and expense, they must provide information that cannot be obtained for less money by other methods.

Costs obviously vary with the size and design of the sample and the length of the questionnaire. Direct costs of interviewing in the three recent large-scale surveys ranged from about $3.35 to more than $5 per interview. Total out-of-pocket costs, including design of the sample, pretest of the questionnaire and instructions, duplication of survey materials, supervisor schools, hiring, training, and supervision of interviewers, and machine processing of data, ranged from about $5 to almost $12 per schedule. In general, cost of interviewing should be only about half the total cost of a survey.

SUMMARY

Experience to date indicates that interview surveys are useful in providing types of data not otherwise obtainable and in checking cur-

rent statistics. It is evident that they can play an increasingly important part in the collection of primary agricultural information to supplement the results of the mailed inquiries which are the backbone of the statistical work of the Bureau of Agricultural Economics. In foreign countries, where the results of mailed inquiries are not very satisfactory, interview surveys serve a useful purpose, and it is anticipated that they will be increasingly utilized in the future. Too much stress cannot be placed on the importance of planning the surveys, designing a questionnaire, obtaining an adequate number of competent supervisors and interviewers and training them, processing the completed questionnaires, making a thorough analysis, and publishing or distributing the survey results so that they will be used to the fullest advantage. Large-scale interview surveys cost too much in time, effort, and money to be done with hasty preparation. They must be carefully planned and as carefully executed.

CHAPTER 18. STATE ASSESSORS' FARM CENSUS

By Charles F. Sarle

The taking of a farm census by the local tax assessor at the same time that he assesses real and personal farm property for taxation purposes is a time-honored and well-established method of obtaining agricultural statistics in many countries of the world.

In this country, however, the over-all administration and technical direction of the assessors' State farm censuses in States that have such censuses have been for years under the general direction of the experienced agricultural statisticians in charge of the cooperative State-Federal statistical offices. This responsibility is delegated by the cooperating State authorities. As a result of this technical supervision, these farm censuses have become an extremely valuable asset to these States and to the Nation. They have particularly increased the accuracy of acreage and production forecasts and estimates of grain and hay crops and of livestock numbers, not only at State and county levels for those States that have them, but also at the national level.

Trained agricultural statisticians have been able either largely to overcome or to avoid many of the weaknesses and shortcomings of a farm census taken by local tax assessors. In some States the completeness of coverage has been built up to a satisfactory level; where this has not been possible, census data have been treated as a sample and regression and other methods of estimation or expansion are successfully utilized. Regression methods of estimation provide a satisfactory means of adjusting for biases that are reasonably constant from year to year. Furthermore, direct questions concerning inventory numbers of livestock are held to a minimum on the census questionnaires.

The purpose of a State farm census is to meet the local demand for annual statistics on agriculture in greater geographic detail than the Federal Crop Reporting Service has had funds to provide. An annual State farm census is made in 14 States, mostly in the midwest. In these States the Federal agricultural census has not provided data by counties at sufficiently frequent intervals to meet local needs.

VALUE AND IMPORTANCE

The State farm census provides a satisfactory basis for annual county estimates of crop acreages in most of the 14 States. Mail samples of crop yields are used to estimate yields per acre.

Consequently, in nearly all of the States that have an annual census, the increasing demand for annual county estimates of acreage and production of all important crops is now met.

State farm censuses are especially valuable in estimating feed-grain and hay crops, for which commercial check data on marketings or quantities processed are inconsequential or nonexistent because these crops are largely fed on the farms where they are produced. State farm censuses contribute materially to the accuracy of the national estimates, as well as to State estimates of these crops. Thirteen States with active annual farm censuses in 1948 produced 73 percent of the Nation's corn crop, 78 percent of the oats, 50 percent of the barley, 43 percent of the hay, 51 percent of the wheat, 75 percent of the rye, and 84 percent of the soybeans for grain.

Annual State farm censuses, when reasonably complete, provide a more accurate indication of year-to-year changes than can be expected from any voluntary mail sample. This is especially true for the acreage of highly localized crops.

LENGTH AND CONTENT OF QUESTIONNAIRE

The questionnaire varies considerably in length and content among the 14 States—from as few as 26 questions to as many as 76. Average length is 46 questions. Major emphasis is on acreage of crops, as 61 percent of all the questions relate to acreage of crops or number of fruit trees, and 7 percent to production of crops. Livestock questions comprise 14 percent of the total; that is to say, 82 percent of the questions relate to crops and livestock. In 11 States the census provides valuable data as to numbers of sows farrowing, milk cows and hens. Information concerning farm machinery is obtained in 8 States, farming practices in 5 States, and marketing practices in 1 State. Farm population data are collected in 7 States (table 7).

Generally speaking, State farm census questionnaires may be grouped into two classes in regard to the crop-year for which the crop acreages are enumerated. In eight of the States the schedules are predominately on a *historical* basis, that is, questions as to acreage and production relate to crops harvested the previous season. Five States are predominately on a *current* basis of planted or intended acreages.

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TABLE 7.—*Number of questions devoted to acres in crops, crop production, livestock numbers and other topics* [1]

States	Total number questions	Farm pasture idle land etc.	Crop acres [2]		Crop production	Livestock numbers	Farm machinery etc.	Practices		Other
			Number	Percent				Farm	Mkt.	
Colo.	75	4	53	71	..	15	1	..	..	2
Ill.	36	4	30	83	..	..	..	..	..	2
Ind.	34	4	28	82	..	..	[3]	..	..	2
Iowa	52	5	18	35	8	11	5	2	..	3
Kans.	76	4	47	62	8	9	2	..	..	6
Minn.	35	2	22	63	..	4	5	..	..	2
Mo.	26	3	22	85	..	..	..	..	..	1
Nebr.	58	3	39	67	1	12	..	2	..	1
N. Car.	49	4	26	53	..	7	4	2	..	6
N. Dak.	58	4	24	41	13	9	2	..	..	6
S. Dak.	53	3	32	60	3	11	..	1	..	3
W. Va.	28	1	17	61	2	6	1	..	..	1
Wis.	36	1	20	56	4	3	..	2	7	1
Wyo.	34	1	16	47	9	3	..	..	..	3
Total	650	43	394	60.6	48	90	20	9	7	39
Percent	100	6.6	60.6	...	7.4	13.8	3.1	1.4	1.1	6.0

[1] The 1948 questionnaire in all States, except Minnesota, Indiana, and Iowa, for which 1949 questionnaires were available for this study.
[2] Including number of fruit trees.
[3] A supplemental tally count of 19 machinery items is printed on the first page of questionnaire booklet.

In one State the schedule obtains both historic and current acreages of field crops. In one other the questionnaire is predominately historical, but it includes five questions concerning planted or intended crop acreages.

Both types of questionnaires have their advantages and disadvantages. Historical acreage data are used in making revisions of acreage and production estimates a year after the crops are harvested, and thereby cumulative error is minimized. Furthermore, as they relate to harvested acreages they are free from "intentions bias" and are more nearly comparable with the United States Census of Agriculture. On the other hand, current acreage data are used immediately in estimating crops of the current season. In States that have current censuses, a subsample of townships is used in estimating crop acreages for the July 1 Crop Report. In all these States the completed farm-census data are used in making the December estimates of crop acreages and production.

Of the 90 questions concerning livestock, those relating to the number of sows farrowed or to farrow are considered most useful in estimating livestock numbers and production. Questions concerning inventory numbers of cows milked probably rank second in usefulness, and inventory numbers of hens third (table 9). A question as to number of feeder cattle bought has proved of considerable value in preparing special lists of cattle feeders which have been used successfully in special-purpose sampling to estimate cattle on feed. This is also true of questions concerning cattle sold, and turkeys raised.

TABLE 8.—*Number of questions relating to acreage and production of crops*

States	Field Acres C[2]	Field Acres H[3]	Field Prod.	Hay Acres C	Hay Acres H	Hay Prod.	Seeds Acres H	Seeds Prod. H	Veg. Acres C	Veg. Acres H	Trees & Vines Acres C	Trees & Vines Acres H	Trees & Vines No. Trees C	Trees & Vines Prod.	Total Acres[1]	Total Prod.
Colo.	..	23	..	..	6	..	2	..	..	14	..	8	..	..	53	..
Ill.	..	13	..	..	8	..	4	..	..	2	..	..	3	..	30	..
Ind.	5	8	6	1	5	..	2	..	..	6	..	1	..	..	28	..
Iowa	14	11	..	..	5	..	2	2	..	..	..	..	..	..	18	8
Kans.	11	2	..	4	5	..	6	..	..	..	6	..	10	8	47	8
Minn.	..	..	..	4	..	..	5	..	2	..	..	..	..	..	22	..
Mo.	19	10	..	..	6	..	4	..	..	1	..	1	..	..	22	..
Nebr.	..	..	..	7	7	..	6	..	..	..	..	..	2	1	39	1
N. Car.	8	14	8	..	6	2	1	..	..	3	..	..	..	..	26	..
N. Dak.	15	8	..	3	5	1	..	3	..	..	..	..	1	..	24	13
S. Dak.	3	..	..	9	2	..	4	2	1	..	..	..	..	..	32	3
W. Va.	10	9	..	..	5	..	..	..	7	..	..	..	..	2	17	3
Wis.	..	..	..	3	..	..	..	4	..	..	..	..	..	..	20	2
Wyo.	..	10	8	..	5	..	1	1	..	..	..	..	..	..	16	4
Total	85	108	22	31	65	3	37	12	10	26	6	10	16	11	394	48
acreage and trees	193			96			37		36		32				394	
Production	..		22	..		3	..	12	..					11	..	48

[1] Includes number of trees.
[2] "C" stands for current, or planted or intended acreages of the current season.
[3] "H" stands for historical, or acreages harvested the previous season.

TABLE 9.—*Questions relating to numbers of livestock* [1]

States	Total	Number raised or born	Inventory numbers			Sows Farrowed			Other
			Specific date						
			Cows milked	Hens	Other	Spring	Fall	Year	
Colo.	15	6	1	..	3	..	..	1	4 Sold
Ill.	..	..	..	..	..	..	..	..	..
Ind.	..	..	..	..	..	..	..	..	
Iowa	11	7	1	1	..	1	..	..	1 Cattle bought
Kans.	9	3	[2] 1	..	1	1	1	..	2 Farm slaughter
Minn.	4	..	1	1	..	1	1	..	..
Mo.	..	..	..	..	..	..	..	..	
Nebr.	12	6	[2] 1	..	1	1	1	..	2 Placed on feed
N. Car..........	7	..	1	1	3	1	..	..	1 Broilers sold
N. Dak..........	9	3	1	1	3	1	..	..	..
S. Dak..........	11	3	1	..	5	1	1	..	..
W. Va...........	6	2	1	..	1	1	1	..	..
Wis.	3	..	1	1	..	1	..	..	..
Wyo.	3	2	..	..	..	1	..	..	..
Total	90	32	10	5	17	10	5	1	10
Group totals...	..	32	32			16			10

[1] Three additional questions related to production of livestock products; wool in North Dakota, and honey and beeswax in Kansas.
[2] During the year.

QUESTIONNAIRE DESIGN

Funds and resources available for field interviewing and tabulation of assessor State farm censuses are so limited that the booklet type (record type) of questionnaire is used, rather than a separate individual interview questionnaire for each farm.

FIELD OPERATIONS

Period of enumeration.—The annual State farm census is taken during definite, predetermined periods in the first half of each calendar year; the period during which it is taken ranges from a little less than 2 months in some States to as long as 5 or 6 months in others. Generally speaking, very few farm-census books are received in the State offices before early June, and the last of the books may not be received until late August or early September.

Enumerators.—In most States actual enumeration is done by townships or minor civil divisions. Data are generally obtained by farm visitation, but in a few places farmers are interviewed in the local assessor's office. In one State both the farm interview and mail are used and in another all three methods are now in use—farm visitation, office interview, and mail—depending on the county.

In most States the work is done by the township or village assessor who is usually an elected official. In a few States, however, an elected county assessor appoints deputy local assessors to collect the data.

In practically all 14 States, local, county, or township funds are used for paying the assessors. In a few States, however, State funds are used to supplement local funds.

Instructions, training, and supervision.—Brief instructions concerning the farm-census questionnaires are prepared by the agricultural statisticians. They are printed on the first pages of the questionnaire booklets furnished the local assessors. In some States these printed instructions are supplemented by special mimeographed instructions and letters, as problems arise and come to the attention of the field statisticians. In most States, representatives of the statistician's office attend annual assessors meetings and give personal instruction.

Very little training in farm-census enumeration is given local assessors in any of the States. The degree of supervision varies greatly among the States, from practically none in some States to other States in which the county auditor or the county assessor provides some supervision and checks the completeness of the enumeration.

Costs of Field Operations.—The actual cost of taking an annual farm census by local tax assessors cannot be determined accurately, as the cost is figured jointly with the cost of assessment of real and personal farm property. As tax assessment is a normal and necessary function of local government, the additional cost of taking a farm census at the same time tax assessments are made is limited to the time required to ask and record the farm-census questions, to add the columns of data, and, in some States, to check for completeness. The travel and time required to locate the farm operator and to establish rapport is properly charged to the tax-assessment work. Consequently, the actual cost of making the assessor's census is much lower than when a farm census is taken by itself.

The time required to take a farm-census enumeration depends upon several factors, of which the number of questions is one of the more important. The type of questions asked also influences cost. Questions relating to current planted acreages of crops probably require less time for the farmer to answer than do historic questions concerning the acreages of crops harvested the previous year. Questions about production of last year's crops no doubt require a little more time than do questions on acreage. Still another factor is the design and structure of the questionnaire itself, and the way in which questions are worded.

The attitude of the assessor toward the farm census also influences the time required. From experience gained in the last few years in interview surveys, it is estimated that from 8 to possibly 25 minutes would be required on an average farm properly to complete a farm-census questionnaire. At 90 cents an hour, the average cost of enumeration per schedule taken would vary from 12 to 38 cents; at 75 cents an hour the cost would vary from 10 to 31 cents.

STATE OFFICE OPERATIONS

In most States questionnaire booklets and instructions are prepared for the printer by the State statisticians and printed by the State department of agriculture. Well in advance of the starting date of the enumeration, these booklets are sent to the local officials responsible for the work. In one State the number of farms and farm acreage for the township from the last Federal census are recorded in the township questionnaire booklets, as a "goal" for the assessor to reach in enumeration of his township. In another State the "total farm land acreage" of the township is written on the front cover of each township book to serve as a goal for the assessor.

In most States the local assessor returns the completed questionnaire booklet directly to the State statistician's office. In one State, however, a preliminary review of the data for each township is made in the counties and the books are returned to the deputy if they are not considered complete; otherwise they are mailed to the State statistician's office. Upon receipt in the State statistician's office, each township booklet is given a preliminary check for completeness of enumeration, and if coverage of farm land or number of farms is not satisfactory the booklet is returned to the local assessor for more complete enumeration.

Editing.—In view of the limited amount of training, supervision, and direction given the local assessors in their farm-census work, all questionnaire booklets need careful editing in the State statistician's office. The amount of editing done varies considerably among the States. Insofar as resources permit, these questionnaire booklets are checked column by column and farm by farm for such errors as listing data in the wrong columns, improper entries, and errors due to misinterpretation of instructions.

In several States the questionnaire includes questions as to land utilized for purposes other than for growing specified crops, such as pasture, woodland, waste, idle and fallow land, and land area in other crops, thereby making it possible to account for all of the land in the farm. The cross addition of the reported acreage for all uses can therefore be checked against the acreage reported for the entire farm, either by individual farms or by township totals. It is customary to make this comparison for township totals, and when discrepancies are serious individual farm acreages are checked to discover errors in addition or omission.

In general, the editing instructions are prepared so that all editing is done in a comparable way. The more significant aspect of editing occurs when township totals for the various items are compared with corresponding totals for preceding years and with comparable Federal census data, especially if the totals appear inconsistent. Township books are reviewed briefly for general completeness and consistency. Any township booklet which appears incomplete for a specific time, when compared with preceding years, is returned to the assessor for more complete enumeration. When it is obvious that the assessor has overlooked a number of farms or has failed to ask a certain question, the book is returned. If it is not satisfactorily completed by the assessor, the incomplete items are "edited in," in keeping with data shown by that township in past years and/or by surrounding townships for the current year. This does not mean that all items are edited to a point at which they appear to

be fully complete. The object of editing is to remove glaring incompleteness so that comparisons on either an absolute or ratio-to-land basis will not be unduly distorted at the county level. This comparison of township totals with preceding years and with the Federal Census is common editing practice among the States.

Summarization.—In the States where crop acreages are current rather than for the previous year, it is customary to re-add all columns in the booklet questionnaire. As previously mentioned, this is not necessary when the acreage balance is used. After addition, the totals from each booklet are copied on sheets with printed column headings, and with township names on the stub. Comparisons are made with township totals for previous years to discover evidence of incompleteness in any items, and necessary adjustments are made, as described under editing. When county totals have been check-added they are transferred to other summary sheets, and totals are obtained for crop-reporting districts and later for the State.

Costs.—Cost records of office operations of the annual State farm census are available for only a few States. Costs range from a few hundred dollars to about $12,000, depending on the size of the State and the amount of effort expended by the statistician's staff on the census.

METHODS OF ESTIMATION

Kinds of estimates made.—In States in which questions as to acreage relate to crops harvested the previous season, annual farm-census data are used in making revised estimates of acreage and production.

In States in which acreage questions relate to the current season's intended acreages, census data are used in making the current season's estimates which are published in December. In order to have an estimate of harvested acreage, it is necessary to estimate abandonment of planted acreages or change from intentions before harvest. In three of these States in which abandonment and change in intentions are usually small, abandonment is estimated from the regular fall acreage, production, and utilization mail sample. However, in two of the States—Kansas and Nebraska—abandonment and change in intentions may be large, especially in years of abnormal weather conditions. In these two States, abandonment is estimated from a large mail survey sent in the fall to a random list of names drawn from the farm-census books.

In the five States that have current crop enumerations, a subsample of assessors' data also is used successfully as a basis for estimating year-to-year changes in crop acreages for the July 1 Crop Report.

Methods.—Methods used in making State estimates from annual farm-census data depend upon several factors, such as whether acreage questions relate to crops harvested the previous year or to the current season's crops, completeness of the coverage, nature of the items for which data are obtained, and degree of statistical refinement desired. The variability of the completeness among counties and townships within a State may result in the use of a combination of estimation methods in one State that differ somewhat from those used in another.

In Iowa, where the farm census is strictly historical and the completeness of coverage of land in farms has long compared favorably with the Federal censuses taken in that State, methods used in making both State and county estimates are simple and effective. Total land in farms for each township is checked against the goal or base of total land in farms that was established more than 25 years ago from county engineers' records and other sources, and subsequently kept up to date. Enumerated total acres of farm land, if incomplete for any township, are adjusted to this base, and crop acreages are adjusted by the ratios of crop acreages to farm-land acreage of the enumerated township data. In case a township book is lost in the mail or destroyed in some way, data for the missing township are prorated by applying percentage changes shown for adjacent townships to the data for the previous year for the township in question. Totals for estimated townships are combined with totals for all other townships to obtain county totals and totals for the State. In Iowa, where the farm census is within one-half of one percent complete, this direct method of adjusting individual township data is satisfactory.

Historical farm-census data are used in making revisions of estimates for the previous year's crops. In Iowa, for all major items, these revisions are usually close to the farm-census acreages as reported. Crop yields per acre derived from the Iowa farm-census data on acreage and production are handled on a regression-chart basis as is any other yield indication.

In most of the other States adjustments for incompleteness are made by townships, either on the basis of Federal census land in farms or the farm-census data for previous years for the same township, as previously described under editing. State totals of all townships are used in two ways (1) as ratios of individual crop acreages to total land in farms on a regression-chart basis, and (2) as percentages of year-to-year changes in individual crop acreages interpreted by regression charts.

Methods of sampling townships for July State acreage estimates.—In Nebraska, an ob-

jective probability sample of about 10 percent of the townships was selected a number of years ago for use in estimating State total acreages in July. A stratified random-sample design was used with at least one township per county. The design was such that the current year's sample could be expanded directly, or the percentage change from the previous year on a matched-township basis could be applied either to the previous year's complete farm-census acreages or to the official estimates. As might be expected from the high correlation between these township crop-acreage totals from one year to the next, especially with major crops, the direct percentage change indicated for the State has proved to be highly accurate, even though some of the crops have a relatively small acreage in the State. Very seldom are any changes in the State estimates of total planted acreage required in the autumn months, unless there has been a pronounced shift in intentions of farmers to plant due to abnormal weather conditions. County assessors are advised that the books from the sample townships will be required early in June. So far they have been able to submit these books without much extra effort in time for use in making the July acreage estimates.

In Minnesota, Wisconsin, and South Dakota, a special effort is made to obtain a sample of township books that is well distributed over the State. The geographic representativeness of the sample is improved by geographic weighting by crop-reporting districts. The sample of townships is used on a matched basis in estimating the year-to-year changes in acreages of individual crops. This method of sampling and estimating July 1 crop acreages has been highly successful in these States for a number of years, especially with the major crops.

In Kansas a sample of counties has been used for a number of years as a supplemental indication for the July 1 acreage estimates. The number of counties for which all of the farm-census books have been received in time for this purpose varies from year to year; books from 29 were available in 1948. The direct percentage change as shown by identical counties has been more reliable than have ratios to land.

Estimating abandonment of acreage.—The "Assessors' Checkup Inquiry," a voluntary individual-farm mail sample, has been used successfully in Kansas for a number of years as an indicator of change in intentions and abandonment of planted crop acreages, as well as an indication of volunteer wheat acreage harvested and wheat yields. The method of sampling is as follows: About 25,000 check-up schedules, representing a 20-percent sample, are mailed about October 10. The rate of return has been around 20 percent, a relatively

good return for this type of mailing list. Questionnaires are sent to every n-th farm as shown by the township roll books. If the farm does not meet specified minimum requirements as to acreage or crops produced, an alternate farm is selected. Because the number of farms per county and the percentage of schedules returned varies in different parts of the State, the sampling rate is not the same in all crop-reporting districts, but it is generally held consistent within each district. A few problem counties in western Kansas in which the rate of return is quite low have been sampled at a higher rate than the rest of the State in order to secure adequate abandonment and yield data for use in preparing county estimates.

Acreage reported to the assessors is listed on the questionnaire in the office before it is mailed to the farmers in the sample. The farmer is asked to fill in the acreage actually seeded and the acreage harvested in two additional parallel columns. Acreage of winter wheat and rye (seeded and volunteer), production of wheat, and information on intended plantings of wheat for the following harvest are also obtained. The amount of wheat seeded or to be seeded can be rather definitely determined by October 10 in most seasons.

Indications of change in intentions or abandonment as shown by this survey are used to adjust assessors' figures as reported, in obtaining both State and county indications. Adjustments at the State level are made on a district basis. Because of the large number of returns and the way in which the sample is selected, the assessors' checkup has been the more reliable and consistent indication for both State and county estimates.

Special-purpose sampling.—A State farm census provides an ever-current list of names of farmers within a State from which lists of producers of any specific crop or class of livestock included in the farm-census questionnaire can be drawn at any time. Furthermore, it supplies names for general-purpose sampling as is done in Kansas and Nebraska for estimating abandonment in planted acreages of crops reported on the farm census. In Iowa, rather extensive use of this source of names has been made in special-purpose sampling of farmers who feed cattle. This project has already been described in chapter 11. The potential usefulness of the State farm census as a source of names for special-purpose sampling has not been fully applied partly because of staff limitations in the field offices.

PUBLIC INTEREST

When an annual assessors' State farm census is given sound technical direction and reasonable administrative supervision and when the

program is integrated with other aspects of the work of Agricultural Estimates, the State office is able effectively to meet the ever-increasing demand for annual county statistics of agricultural production and, in some instances, even for township statistics. Demand for localized agricultural statistics within a State appears to be greatest in those areas in which changes in agricultural production are more pronounced. Year-to-year changes are likely to be considerable in the Great Plains States because of the variability of the weather from season to season. Longer time trend changes in agriculture are probably greatest in the Southeastern States because of the economic impact of industrialization and the cash-crop nature of the agriculture. In areas in which important changes in agricultural production occur, the Federal census, taken only once in 5 years and not available for nearly 2 years after it is taken, does not satisfy the demand for timely county statistics of agricultural production.

In view of the value of the assessors' State farm censuses in providing a valid statistical basis for county statistics within a State and their importance in contributing to the accuracy of State and national estimates, no effort should be spared to insure their continuance. Their continuance cannot be taken for granted. Many assessors feel that it is an unnecessary job superimposed upon their assessment work, for which they are inadequately paid. Active support of the farm-census program at State, county, and local levels is important, not only to insure continuance of the program, but also to obtain greater completeness of coverage and to maintain high standards of accuracy. Local assessors themselves need to have the importance of the farm-census work brought to their attention by the users of county statistics.

Attendance of the statisticians at State, district, and county meetings of the assessors, and personal visits with them, help to build good will and to acquaint them with the value and importance of the work they are doing.

CHAPTER 19. A LOOK AHEAD

By CHARLES F. SARLE

PERSPECTIVE

In this changing world no national agricultural statistical service can remain stationary. The present service of the United States started from a small beginning in the eighteen sixties. Practically the only source of current information concerning agriculture at that time was a small voluntary mail sample of county reporters, who periodically received questionnaires asking, in terms of the locality in which the reporter lived, for condition and yield per acre of major crops, farm prices and wages, and year-to-year changes in crop acreages and livestock numbers. In the eighteen nineties the size of the sample was materially increased by establishment of a "township list" of reporters. After the turn of the century still another list was established. It was called the "field aid list" and was about the size of the township list. All three lists were consolidated and moved to the field offices in the early nineteen thirties, and those on the consolidated list became the "general crop reporters" of today.

About 1914 the estimates of crop condition and acreage were combined and interpreted in terms of prospective production of the various crops. In the early twenties the individual-farm type of mail schedule replaced the judgment-for-the-locality type in estimating year-to-year change in crop acreages and livestock numbers, and the sample was increased several fold by building up a large list of farmers in each State and by instituting the rural mail carrier surveys. In the late twenties the regression method of estimation was developed. It has been used ever since 1930 except with farm prices, farm employment, and wage rates. Accuracy of estimates has been materially increased by the use of regression methods. For the cotton crop, for instance, the departures of the current December production estimates and the revised estimates made the following May from the final revised estimates have been cut in half since 1930 as compared with the nineteen twenties.

During the last 15 years the amount of statistical information that the organization is called upon to supply has tremendously increased. This was in response to requests for statistics on items that were previously not covered by the program as well as for more detail in the statistics that were already being published. Those developments have required the use of more refined sampling and estimating methods. Considerable progress has been made in obtaining more complete and accurate check data on volume of sales and market movement of agricultural products, especially manufactured dairy products. Agricultural adjustment data relating to crop acreages also have been utilized. These check data are invaluable in improving the accuracy of the revised estimates which in turn are used on a regression basis in making forecasts and estimates from current mail sample surveys. Furthermore, the theory and practice of objective probability sampling, both area and list sampling, as well as field sampling of growing and mature crops, have been developed and tested since about 1937. During the last few years a number of Nation-wide probability area interview surveys have been made, and the utility of semicontrolled and controlled mail sampling has been demonstrated. The potentialities of special mailing lists and the use of scientific sampling methods in mail surveys are receiving more attention. Devices such as interview sampling of nonrespondents to a mail survey and the measurement of trends shown by data reported in returns to successive mailings are utilized for the purpose of further controlling bias that may be introduced by nonresponse.

The effectiveness of improved questionnaire design from the standpoint of increasing returns and improving the accuracy of replies to individual questions in voluntary mail sampling has also been demonstrated.

THE FUTURE

On the basis of present knowledge concerning the theory and practice of sampling and estimating methods, the Bureau of Agricultural Economics is in a position to make substantial progress in the years ahead in terms of increased accuracy of forecasts and estimates and efficiency of operations. Research at the *operational level* is now needed (1) further to improve the accuracy and efficiency of general-purpose voluntary mail sampling, especially of individual farms and processing establishments in States for which the present samples are small and unstable, (2) to develop the use of semicontrolled and controlled mail sampling techniques in order to improve the special-purpose sampling of highly commercialized agricul-

tural products which cannot be successfully handled by general-purpose sampling, (3) to increase the accuracy of estimates of crop yields made when crops are mature or later, (4) to develop and standardize methods for making county estimates along sound statistically efficient lines, and (5) to identify factors affecting the response rate to mail inquiries. Returns of a voluntary mail sample can be made more accurate and meaningful and the percentage of response can be increased by improved design of questionnaires. The effectiveness and usefulness of the assessors' State farm census program in 14 States can be increased above present levels.

The time may soon come when current estimates will be required of agricultural conditions, practices, and processes that cannot be successfully sampled and estimated by means of voluntary mail sampling and regression methods of estimation. In fact, the plans and recommendations for initiating an annual sample census utilizing a probability area sample are now being developed jointly by the Bureau of Agricultural Economics and the Census Bureau. The sample used would be essentially a general-purpose sample, the efficiency of which would be increased by using differential sampling rates to obtain proportionately larger representation of the large farms. Semicontrolled and controlled mail sampling of the lists of respondents to the interview survey could serve as a basis for estimates of year-to-year changes in crop acreages and livestock numbers and intraseasonal estimates of livestock numbers and crop acreages. Quarterly estimates of livestock numbers would be feasible, and the voluntary individual-farm mail samples now used for March acreage intentions to plant and for the July 1 crop acreage estimates could, in time, be replaced by semicontrolled mail sampling, provided the original area interview survey is of adequate size for this purpose. Eventually, this approach would probably substitute more carefully controlled mail surveys for the present three rural carrier surveys, two on livestock and one on crop acreages harvested, and perhaps also for the acreage utilization and production survey as well. An annual sample census would place a valid statistical foundation under the general-purpose sampling of individual farms, strengthening many of the weaker points of present procedures.

Special-purpose sampling too could be strengthened and improved materially by close coöperation with the Federal Bureau of the Census in developing a complete list of names, addresses, enumeration district locations, and other control information for producers of special commodities who cannot be sampled satisfactorily by general-purpose sampling, either interview or mail. These lists could be kept up to date by each State office of Agricultural Estimates until the next census becomes available.

With complete current lists of these special producers, their acreage or production in the census year, and their geographic location, it would then be possible to utilize the techniques of controlled mail sampling, either alone or in combination with an annual sample census. As an example of combining the two methods, we might take the poultry industry of New England. Controlled mail sampling might be used for the large producers who comprise 10 percent of all farms having poultry, but have 70 percent of the hens. The annual sample census (a general-purpose sample) would be used to represent the other 90 percent of the poultry farms which have less than 30 percent of the hens. This same principle might well have broad application for many of the populations requiring "special-purpose" sampling including fruits and vegetables and specialized field crops.

The time may come when it will be necessary to increase the accuracy of estimates of yield per acre by harvesting very small samples from fields selected according to the principles of probability area sampling, as was done with Alabama yields of corn for grain in 1948. Sampling and estimating techniques are available, and surveys of mature crops just before harvest that have been conducted during the last 10 years have provided the necessary experience.

It cannot be emphasized too strongly that the changes foreseen will occur slowly and gradually, as they have in the past. They will not come automatically with the passage of time, but only as a result of increased public interest in, and demand for, more and better statistics, implemented by increased facilities.

PART II. ESTIMATES AND REPORTS ORIGINATING OUTSIDE OF AGRICULTURAL ESTIMATES

CHAPTER 20. FARM INCOME

By Ernest W. Grove, Margaret F. Cannon, and Harry C. Norcross

Estimates and forecasts of farm income and expenses are essential guides in the determination of agricultural policy. There is also widespread popular interest in the farmer's income; and its continuous measurement has been necessary in order to satisfy this general interest. Under the circumstances, it is not surprising that development of such measures should have been among the earliest projects undertaken by the Bureau of Agricultural Economics after its establishment in 1922.

As the effects of changing prices, production, sales, and costs are all combined in estimates of net farm income, the latter are a composite reflection of the major economic forces in agriculture. And similarly, from a statistical point of view, the estimates to be considered in this chapter are in considerable part a combination and synthesis of the measures discussed in other chapters of this report. Under the circumstances, a simple description of the statistical methods used in constructing the estimates of farm income and expenses is not enough for an adequate understanding of their nature and significance. It is even more important for this purpose to consider how the estimates were originally developed, the uses for which they were intended, the general concepts employed, and the characteristics of the principal series.

DEVELOPMENT OF THE ESTIMATES

The first estimates of gross and net farm income in the United States appeared in 1913.[23] But they had been developed largely from data collected in the 1910 Census of Agriculture and were for 1 year only. It was not until 1924 that a full set of annual estimates was published— on a crop-year basis beginning with 1919-20.[24] In one phase or another, the work has been carried on continuously since then; the initial estimates have been kept up to date, revised, improved, and supplemented with new information from time to time. Monthly estimates of cash receipts from farm marketings first appeared in 1925. In 1930, gross and net income were put more nearly on a calendar-year basis. State estimates of gross and cash farm income also appeared in that year. And in 1932 estimates of gross income and the more important production expenses were extended back to 1909.

In 1936, the work was given added impetus and a somewhat different orientation by the new concept of "income parity" for agriculture, first included as one of the goals of the farm program in the Soil Conservation and Domestic Allotment Act. As revised in 1938, the legislative formula provided in general that the net income of persons on farms from farming is at parity when it bears the same per capita relationship to nonfarm income as in the 1910-14 base period. Although results of the income work up to that time had been considerable, they were nevertheless incomplete or otherwise unsatisfactory for this type of comparison. So the Department of Agriculture launched an extensive project of research and estimation in the field of farm-income statistics.[25]

The results of this project have formed the basis for the present measures. Its major objectives were three: (1) to extend all the estimates back to 1910 as required by the income-parity formula, (2) to present them on a full calendar-year basis comparable with similar estimates of nonagricultural income, and (3) to expand the data and improve their comparability in other respects. Partial results were published as they were ascertained in a series of 31 reports under the general heading of *Income Parity for Agriculture*. All the results in preliminary form were assembled and published in 1941; and the various series have been re-

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[23] Spillman, W. J. the farmer's income. U. S. Bur. Plant Indus. Cir. 132, 1913.

[24] United States Bureau of Agricultural Economics. crops and markets, monthly supplement. August 1924, pp. 286-7.

[25] O. C. Stine exercised general supervision over the conduct of this project. For an early prospectus, see his paper, income parity for agriculture Natl. Bur. Econ. Res. Studies in Income and Wealth, v. 1, 1937. For a subsequent appraisal, see the concept of income parity for agriculture, by E. W. Grove, Natl. Bur. Econ. Res. Studies in Income and Wealth, v. 6, 1943.

vised and brought up to date every year since.[26]

Thus, the estimates currently in use are relatively new, having been developed and assembled within the last 15 years. They were designed specifically to meet the requirements of the legislative formula for determining "income parity" for agriculture, and some of their characteristics stem directly from this fact. Nevertheless, they have also provided a systematic and reasonably comprehensive set of general-purpose statistics on income from farming operations and on expenses of farm production in the United States for the period from 1910 to date.

This refers to estimates for the United States as a whole. Estimates for individual States are also available for some of the more recent years. Monthly estimates of cash receipts from farm marketings in each State are published currently, and on an annual basis State estimates of cash receipts by commodities are available back to 1924.[27] State estimates of production expenses and net income were the last important series to be developed.[28] As yet, they are available only for the years 1929 and 1939-45.

GENERAL CONCEPTS, SOURCES, AND METHODS

Agriculture is composed of a very large number of independent proprietors; and only a few of the more prosperous of these have ordinarily been required to report their incomes to the tax collector. Incomes of more representative groups of farmers have been obtained in several interview surveys on a sampling basis in recent years. But these surveys have not been sufficiently comprehensive, continuous, or reliable to serve as an adequate basis for the construction of systematic estimates of farm income and expenses.

In the absence of direct reporting on anything like an adequate scale, it has been necessary to develop the estimates by indirect methods, using available data on production, marketings, prices, and costs. The procedure followed in the Bureau of Agricultural Economics has been to treat agriculture as though it were one tremendous enterprise, and to derive its net income by first computing "gross income" and then deducting aggregate expenses of production.

The market values of sales and home consumption are the principal components of gross farm income. They have been built up commodity by commodity and State by State from estimates of production, disposition, and farm prices of the various commodities released periodically by the Crop Reporting Board of the Department of Agriculture, and discussed in previous chapters of this publication. Earlier estimates of gross farm income were not on a full calendar-year basis. Sales of livestock and livestock products were for calendar years; but in the case of crops, most of which have marketing seasons extending through parts of two successive calendar years, both sales and home consumption were usually assigned to the year in which the crop was produced regardless of when it was sold. This has been corrected in the current series, in which monthly prices are generally applied to estimated monthly marketings and the totals for each of the 12 months in the calendar-year are added together.

In the case of production expenses, estimates are generally based on enumerations in the quinquennial census of agriculture or on the results of special sample surveys. For years other than census or survey years, for the most part they have been interpolated or extrapolated on the basis of relative changes in available series that are similar or related to the expense items in question. Whenever possible, a combination of two series is used, one representing or indicative of changes in quantity and the other of changes in price. For a very few types of cost, however, the records of public or private agencies provide the basis for direct annual estimates.

Thus, all the estimates are constructed from price, quantity, and value data that have been collected primarily for other purposes. But there is reason to believe that gross income and most of its components are more accurately measured than production expenses. The latter are not so firmly grounded in recurrent field reports as are the former.

SUMMARY DESCRIPTION OF MAJOR SERIES

Table 10 presents the major totals that are currently in use, and gives an indication of how they were derived. It is designed solely for purposes of illustration; and preliminary figures for 1947 are included simply to show the order of magnitude of the various series.

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[26] The most recently published estimates appear in United States Bureau of Agricultural Economics NET FARM INCOME AND INCOME PARITY REPORT, 1947. U. S. Bur. Agr. Econ. Farm Income Situation, August-September 1948, pp. 9-21. [Processed.] New estimates each year and revisions for several previous years are published regularly in the monthly issues of this periodical. For some of the more detailed series before 1940, the latest estimates are given in UNITED STATES BUREAU OF AGRICULTURE ECONOMICS NET FARM INCOME AND PARITY REPORT, 1943, AND SUMMARY FOR 1910-42, 1944. [Processed.]

[27] UNITED STATES BUREAU OF AGRICULTURAL ECONOMICS. CASH RECEIPTS FROM FARMING, BY STATES AND COMMODITIES, CALENDAR YEARS 1924-44. Bur. Agr. Econ., 1946. [Processed.]

[28] UNITED STATES BUREAU OF AGRICULTURAL ECONOMICS. INCOME PARITY FOR AGRICULTURE, PARTS I-VI, 1938-45. See part VI, Sec. 1.

The first seven lines of the table comprise gross income and its principal components. These estimates are "gross" in the sense that they represent the total market value, actual or imputed, of commodities and services produced by farms in the United States, without any deduction for costs incurred in their production, and without any consideration as to who reaps the ultimate benefit from their sale or use,—be he a farm operator, a landlord, a farm laborer, or a banker. Cash receipts from farm marketings, in the case of crops, include all sales of crops by farmers; purchases of feed and seed are deducted later as production expenses. Similarly, in the case of livestock, estimates include all sales except those by one farmer to another in the same State, with purchases of livestock by farmers in other States included as a production expense in line 8. Farm sales of firewood and other forest products are included in the crop totals.

TABLE 10.—*Principal Series Relating to Farm Income and Expenses, with Estimated Values for 1947*

[Values in Millions of Dollars]

Series	1947 Value
(1) Cash receipts from marketings of crops	13,696
(2) Cash receipts from marketings of livestock & products	16,490
(3) Total cash receipts from farm marketings	30,186
(4) Government payments to farmers	314
(5) Market value of home consumption of farm products	3,105
(6) Rental value of farm dwellings	1,100
(7) Gross farm income	34,705
(8) Production expenses	− 16,874
(9) Realized net income of farm operators	17,831
(10) Net change in inventories held for sale on farms	− 1,235
(11) Farm wages of laborers living on farms	1,952
(12) Net income of persons on farms from farming	18,548
(13) Farm wages of nonresident laborers	839
(14) Net rent paid to nonfarm landlords	1,534
(15) Interest paid on farm-mortgage debt	222
(16) Net income from agriculture	21,143

Government payments, which cover the period 1933 to date, include rental and benefit, conservation, price-adjustment, parity, and production payments—in short, all money paid directly to farmers by the Government in connection with its various farm programs. Indirect financial aid, transmitted to farmers through commodity price supports or nonrecourse loan rates, is counted in cash receipts from marketings. Government payments to landlords are included, as well as those to farm operators, but the former are also represented in lines 8 and 14 of table 10 as a part of total rental payments to nonfarm landlords. The Bureau of Agricultural Economics usually presents all the major series both including and excluding Government payments.

"Home consumption" comprises all farm-produced food and fuel consumed directly in farm households, and is valued at prices received for the sale of similar products. It includes food and fuel furnished to hired farm laborers, later deducted as a part of total labor costs to farm operators.

The rental value of farm dwellings is an imputed gross figure that covers all dwellings. Whenever services to be obtained from consumers' durable goods are commonly purchased on a rental-payment basis, as is the case with houses and other types of dwelling units, comparability of income totals is best achieved by including also an imputed rental value for the services obtained by persons who have bought such goods outright. In agriculture, however, it is difficult to distinguish between rent paid for a farm as a business unit and rent paid for use of the dwelling by the farmer and his family. For this reason, it seemed best to charge off all rents paid as an expense of production, but to offset this deduction in some measure by adding an imputed rental value for all farm dwellings, whether occupied by tenants or owners. This is a gross value; later deductions of taxes, insurance, interest, maintenance, depreciation, and net rents are for farms as a whole with their buildings and equipment, and they include shares allocable to farm dwellings.

The series on total farm production expenses, line 8 in the table, comprises the aggregate cost to farm operators, or all of that part of gross farm income which is not retained by farm operators. It includes overhead costs as well as current operating expenses, and is composed of some 40 separately estimated series. Its principal components are listed below in the more detailed section on methodology. In the case of farm rents, only net rents going to nonfarm landlords are included as an expense. Other farm rents, paid to landlords who are also farm operators, are not included as they constitute offsetting items of income and cost for farm operators as a group.

Realized net income of farm operators is obtained by subtracting total production expenses from gross farm income. The term "realized" is used because the results represent the net value of farm output only as it is sold or used by the

farm family, with no allowance either for commodities produced but not sold or consumed during the year or for sales in excess of current production. In other words, the estimates do not include changes during the year in farm inventories of crops and livestock.

Inventory changes are allowed for, however, in the next major series shown in the table. This series, or the net income of persons on farms from farming, is the one that has been used, together with corresponding estimates of the income of persons not on farms, in the legislative formula for computing income parity for agriculture. It includes: (1) The realized net income of farm operators, (2) the value, at year-end prices, of the net change during the year in farm inventories of livestock and of crops held for sale, and (3) wages, in cash or in kind, paid to farm laborers who live on farms. Inventory changes are included here primarily in order to achieve comparability with the net income of nonfarm business enterprise as ordinarily reported. They represent only those commodities that are held for ultimate sale, and exclude changes in crop inventories held for feed. Only about two-thirds of all hired farm workers live on farms; and in compliance with the residence criterion in the income-parity formula, only their wages are included in this series.

Net income from agriculture, the last line in the table, is obtained by adding back into the series the wages, rents, and interest that were previously excluded because they went to persons who were not farm residents. In other words, it is the total net income originating in agriculture regardless of who receives it.

The principal series, the way in which they are combined, and the meaning that attaches to them both severally and in combination have been indicated; a more detailed consideration of the methods used in estimating their various components follows.

METHODS OF ESTIMATING CASH RECEIPTS FROM MARKETINGS

More than 125 commodities or commodity groups are included in this category; and each is separately estimated. With few exceptions, moreover, cash receipts are estimated separately for each State in which the commodity is produced; and estimates for the United States are simply the sums of the State estimates.[29] In general, therefore, it should be as-

sumed that the methods discussed below are applied on a State basis.[30]

References to quantities marketed, monthly distribution of marketings, and prices received by farmers are as reported by Agricultural Estimates unless otherwise specified. When these basic data are regularly provided, methods used in estimating cash receipts are much the same for each commodity. But when the data are incomplete, methods of estimation are necessarily different. And in the case of certain crops for which full data are provided, their use in estimation of cash receipts has been complicated by the loan programs of the Commodity Credit Corporation.

Annual estimates for crops.—The simplest case is when all or practically all of a crop is sold during the year in which it is produced, and the value of crop-year sales can be used without any adjustment as the value of calendar-year sales. This is true of the following crops: Truck crops for processing,[31] tung nuts, cherries, apricots, plums, cranberries, figs, dates, olives, persimmons, pomegranates, pineapples, walnuts, almonds, pecans, filberts, sugarcane sirup, maple sirup, maple sugar, sorgo sirup, hops, crimson clover seed, lupine seed, Austrian winter peas, sunflower seed, rapeseed, Kentucky bluegrass seed, white clover seed, Ladino clover seed, redtop seed, meadow fescue seed, common ryegrass seed, perennial ryegrass seed, hairy vetch seed, purple vetch seed, common and Willamette vetch seed, and Hungarian vetch seed.

The marketing season for most crops, however, extends through parts of two calendar years. And in such cases, calendar-year estimates of cash receipts are obtained by distributing total crop-year marketings by months, multiplying these monthly marketings by midmonth prices received by farmers, and adding the results for the twelve calendar-year months. Crops to which this method is applicable, without any allowance for Commodity Credit Corporation loans, are as follows: Buckwheat, hay, peanuts, sweetpotatoes, cottonseed, grapefruit,

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[29] The only important exceptions are in the case of forest, nursery, and greenhouse products, where estimates are made first for the United States as a whole and then distributed by States.

[30] For annual estimates of cash receipts, a more complete summary of methods than is provided here may be found on pages 162-174 of CASH RECEIPTS FROM FARMING BY STATES AND COMMODITIES. (See footnote 27, p.   .) And for 18 of the more important commodities and commodity groups, complete details are given in the 18 sections of PART I, INCOME PARITY FOR AGRICULTURE. (See footnote 28, p.   , Part I, Secs. 1-18.) The monthly estimates are discussed more fully in UNITED STATES ESTIMATES OF MONTHLY CASH FARM INCOME and INDEX NUMBERS OF INCOME, JANUARY 1935 TO SEPTEMBER 1942, Bur. Agr. Econ., December 1942; but a few of the methods have been changed since that report was issued.

[31] Asparagus, lima beans, snap beans, beets, cabbage, sweet corn, cucumbers, green peas, pimientos, spinach, and tomatoes.

limes, lemons, oranges, apples,[32] peaches, pears, alfalfa seed, alsike clover seed, cowpeas, lespedeza seed, red clover seed, sweetclover seed and timothy seed.

A nonrecourse loan, made to a farmer by the Commodity Credit Corporation, is treated as cash receipts in the month when the loan is made. If the crop is later redeemed and the loan repaid, the outlay required for such redemption is treated as an offset to cash receipts during the month it takes place. But total crop-year marketings include quantities delivered to the Commodity Credit Corporation—that is, quantities placed under loan but not redeemed —whereas the monthly percentage distribution of marketings does not include such deliveries. To avoid double counting, therefore, it is necessary to subtract deliveries from total marketings before the monthly distribution of sales is made. After applying mid-month prices to the monthly quantities thus obtained, the value of loans is added and the value of redemptions subtracted, month by month as they occur. Crops to which this method applies at the present time are as follows: Rice, rye, barley, corn, sorghum for grain, oats, flaxseed, soybeans, potatoes, dry edible beans, and dry field peas.

For two additional loan crops the method varies from that described above. In the case of wheat, crop-year marketings are further adjusted to include sales out of stocks; or, in the case of increased stocks, the crop-year total is reduced by the amount of the increase. For this purpose, both total stocks on farms and balance of loans outstanding in warehouse storage are used. As farmers do not ordinarily redeem their loan cotton, but rather sell any equity they may have in it, a deduction is not made for the value of cotton redeemed from the Commodity Credit Corporation. Instead, the total amount of cotton put under loan is subtracted from crop-year marketings before a monthly distribution of the quantity sold on the market is made. The value of loans is added to the value of sales, month by month, and the amount of cotton redeemed is valued at an "equity price," over and above the loan rate. The result is added to cash receipts from regular sales during the month.

For some crops whose marketing seasons extend into the next calendar year, monthly prices are not available. In such cases, constant prices are assumed; and the value of crop-year sales (total marketings times the season average price) is distributed directly by months in proportion to estimated sales. This method applies to the following crops: Mung beans, grapes, prunes, avocados, sugarcane for sugar,

hemp, popcorn, broomcorn, crested wheatgrass seed, Bermuda grass seed, mustard seed, Sudan grass seed, and bromegrass seed.

Cash receipts from tobacco are estimated separately for the various types. For each type except cigar leaf, crop-year sales are distributed by weeks on the basis of warehouse auction sales.[33] Weekly prices, also obtained from warehouse auction sales, are applied to estimated quantities sold. Crop-year totals of weekly cash receipts are adjusted to the value of production of the crop, and adjusted weekly cash receipts are then added to calendar-year totals. For the cigar types, crop-year sales are distributed by months on the basis of a seasonal marketing pattern derived from data supplied by the State Statisticians, and modified from time to time by current information as reported in newspapers and trade journals. These estimated monthly sales are multiplied by monthly prices as reported by Agricultural Estimates, and cash receipts for the 12 calendar-year months are then added. Unlike other crops which have loan programs, loan rates for tobacco and quantities placed under loan are automatically reflected in auction-market prices and sales respectively. If any profit above the loan rate should later accrue to the grower, it is allowed for separately at that time.

In the case of sugar beets, calendar-year cash receipts consist of the final payment on the preceding year's crop received by growers from processors, plus the initial payment on the current year's production. Government payments under the Sugar Act are not included with cash receipts from farm marketings of sugar crops, but appear as a component of the series on Government payments.

Cash receipts from forest products represent farm sales of firewood, fuel wood, standing timber, logs, posts, ties, turpentine, resin, etc. Estimates are based on year-to-year percentage changes in average value of forest products sold by farmers, as indicated in mailed questionnaires obtained by Agricultural Estimates. These data are tied in with bench-mark census data through 1929, and are checked currently against information on marketing conditions supplied by the United States Forest Service. Estimates are made initially for the United States as a whole.

United States estimates for nursery and greenhouse products are based on the 1929 Census of Horticulture, supplemented by the Census of Agriculture for each 5-year period. In the absence of any current data bearing directly on prices and marketings of these products, estimates for noncensus years are derived from

[32] In addition to commercial sales, cash receipts from apples include an allowance for sales in noncommercial areas based on the correlation between total and commercial sales during the years 1934-38.

[33] UNITED STATES PRODUCTION AND MARKETING ADMINISTRATION. WEEKLY TOBACCO MARKET NEWS REPORT. State Divisions of Markets cooperating. [Processed.]

changes in total nonagricultural income and changes in average prices received by farmers.

Receipts from all berries other than strawberries and cranberries are estimated as a fixed percentage of receipts from strawberries on the basis of the latest census of agriculture. Similarly, receipts from other fruits not specifically mentioned in this section are derived on the basis of their census relationship to total receipts from all fruits.

Receipts from strawberries, and receipts from each of 26 truck crops sold for fresh market, consist of commercial sales plus market-garden sales, both valued at the season average price received for commercial sales. Truck crops included here are those on which Agricultural Estimates reports commercial sales for fresh market, as follows: Artichokes, asparagus, lima beans, snap beans, beets, cabbage, cantaloups, carrots, cauliflower, celery, sweet corn, cucumbers, eggplant, escarole, garlic, honeyball melons, honeydew melons, kale, lettuce, onions, green peas, green peppers, shallots, spinach, tomatoes, and watermelons.

The sum of cash receipts from the foregoing truck crops is then expanded to include others reported only by the Census of Agriculture, on the basis of their relationship to total truck crops as shown therein.

A number of important crops already mentioned are grown only in small amounts in certain States; and the regular reports of Agricultural Estimates on these crops may not include these States. In such cases, however, cash receipts are reported in the Census of Agriculture, and census data are interpolated or extrapolated in proportion to changes in cash receipts for the same crop in one or more neighboring States.

Annual estimates for livestock and livestock products.—Unlike crops, most livestock items are produced more or less continuously throughout the year. Output may vary seasonally; but it is not confined to a particular season of the year as is the case with most crops. As there is no "crop-year" for these commodities, the value of sales is reported on a calendar-year basis and may be used directly as an estimate of cash receipts. The commodities for which this is true are discussed in chapters 11, 12, and 13 above. They include: Cattle and calves, hogs, sheep and lambs, wholesale milk, retail milk, butterfat, farm butter, chickens (excluding commercial broilers), commercial broilers, eggs (chicken), turkeys, horses, mules, and beeswax.

A few livestock products, however—wool, mohair, and honey—are more like "crops" in this respect, and are treated accordingly. They are produced at a certain time of the year; and sales may extend into the next calendar year.

Total sales are therefore distributed by months; in the absence of monthly prices, each monthly quantity is multiplied by the season-average price; and cash receipts for the appropriate months are added to calendar-year totals.

Data on ducks, geese, pheasants, guineas, quail, pigeons, etc.—generally lumped under the heading, "other poultry"—are not included in the regular reports of Agricultural Estimates. The value of their total production, as shown in the latest census of agriculture, is estimated as a fixed percentage of the total value of chickens, broilers, and turkeys produced. And the value of their sales or cash receipts in any given year is assumed to bear the same relationship to value of production as is shown by chickens and turkeys combined for that year.

Packaged bees are another special case. Quantities shipped, as reported by Agricultural Estimates, are valued at prices reported in trade journals.[34]

Current monthly estimates. — In general, methods used in deriving the annual estimates apply also to current monthly estimates of cash receipts. But data available are less complete on a current basis, and estimates must rest more heavily on assumption of continuity in previously established relationships. For the most part, monthly prices are currently reported by Agricultural Estimates. So the problem is essentially one of determining monthly marketings well in advance of the final reports on such marketings.

Marketings of each type of meat animal are estimated from the volume of its receipts at 66 principal markets,[35] using the correlation between such receipts and total monthly farm sales during previous years. Sales of eggs and dairy products are each determined from monthly production reports released by Agricultural Estimates. But the total for milk or its equivalent must be broken down according to the various methods of sale—wholesale milk, retail milk, and butterfat—in order to apply the prices of each separately. This break-down is accomplished partly from current information and partly on the basis of relationships in the previous year.

An annual total of sales of chickens (other than commercial broilers) is established by assuming the same ratio to sales during the preceding year as the number of chicks expected to be hatched bears to the number hatched the year before, with an adjustment for the change in number of layers on farms January 1. After allowing for a bulge in marketings of young

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[34] As in *Gleanings in Bee Culture,* published by the A. L. Root Co., Medina, Ohio.

[35] Reported monthly by the Production and Marketing Administration.

chickens between 4 and 8 months after the peak of hatchings, the remaining quantity to be sold during the year is distributed by months in the same proportion as in the preceding year. Estimates of annual sales are revised from time to time during the year as better information becomes available. Quantities of commercial broilers marketed each month are estimated from numbers of broiler chicks placed on farms 3 months earlier, as reported by Agricultural Estimates for seven of the most important broiler areas. Marketings of turkeys during the first half of the year are assumed to be in the same proportion to numbers on hand January 1 as was the case during the same months of the year before. For the latter half of the year, estimates are based on the size of the turkey crop, with a monthly distribution corresponding to that of the previous year.

Little if any current data are available for other livestock items as to either sales or prices; and it must be assumed that their cash receipts remain about the same as in corresponding months a year earlier. But these items represent only a very small proportion of total cash receipts.

For most crops, the total quantity of current crop-year sales is estimated from the correlation between total sales and total production in previous years. And in the absence of current market data, a normal seasonal distribution—usually an average for the two crop years just preceding—is used to derive estimates of monthly sales. But a few sources of current information on crop marketings are available, especially for cotton and tobacco. The Bureau of the Census furnishes data on cotton ginnings, which are used as an indication of cottonseed sales; and with a slight lag, these same data yield a monthly percentage distribution that may be applied to sales of cotton lint.

Receipts from tobacco are estimated currently by the same method described for the annual estimates, except that the final adjustment to revised annual totals cannot be made until the end of the crop-year. The normal distribution of marketings used for other crops may also be adjusted from time to time in the light of whatever information becomes available concerning weather conditions, stocks on farms, unusual transportation situations, Government purchase agreement programs, etc.

The treatment of Commodity Credit Corporation loans and redemptions is identical with the method described above in connection with the annual estimates. But the subtraction of total deliveries, or total loans in the case of cotton, from crop-year sales at the beginning of the marketing season requires some extremely tenuous forecasting well in advance of the fact in the case of the current monthly estimates.

Revised monthly estimates.—For several recent years—1935–39 and 1945 to date—monthly estimates of cash receipts have been revised to agree with the revised annual totals. For many commodities, these final monthly estimates are simply a byproduct of the method used in deriving calendar-year totals. But for others annual totals must be distributed by months if final monthly totals are to be obtained.

Monthly distributions of sales are reported for major livestock groups after the end of the calendar year. In the minor cases that are not reported, distributions previously used must be held constant from year to year. And when only season average prices are reported, estimated monthly sales must be valued at constant prices.

Monthly estimates for most crops are obtained in the process of developing the annual estimates. In the case of truck crops and some fruits, quantities of calendar-year sales are distributed on the basis of carlot shipments or truck unloads, the results are multiplied by monthly prices, and the totals thus obtained are adjusted to agree with the annual totals previously derived. For some fruits whose monthly sales may be derived from carlot shipments or truck unloads, constant prices must be assumed. In several other cases monthly information is almost wholly lacking, and calendar-year cash receipts are distributed by months according to constant percentage patterns that are believed to represent normal seasonal marketings.

METHODS OF ESTIMATING OTHER ELEMENTS IN GROSS INCOME

In addition to cash receipts from marketings, gross farm income includes (1) Government payments to farmers, (2) value of home consumption of farm products, and (3) rental value of farm dwellings. A fourth element considered —net change in farm inventories—is not included in gross income as initially calculated; but it is later added to several of the net-income series. Rental value of dwellings is the only one of these four elements that is not estimated originally on a State basis.

Government payments to farmers.—Money paid directly to farmers by the Federal Government in connection with its various farm programs is a matter of continuous fiscal record and is reported by the responsible agency, which is the Production and Marketing Administration. The number of programs that involve direct payments has been considerably reduced since the end of World War II; and only two types of payments were made in 1948—conservation and Sugar Act.

All payments arising under these programs are included here. Relatively small amounts

may go to the landlord instead of the farm operator, especially in the case of share tenancy. This matter is considered in the section on production expenses.

Value of home consumption of farm products.—Significant quantities of almost half of the commodities included in cash receipts from marketings are consumed directly on the farms on which they are produced. As previously noted, these quantities of food and fuel wood are valued at prices received for the sale of similar products.

For livestock items, calendar-year values of home consumption are as reported by Agricultural Estimates. For most crops, information is not available as to monthly distribution or rate of home consumption; so crop-year quantities are assumed to apply to the calendar year. This assumption probably introduces only a slight error in the results because the volume of home consumption, unlike the volume of sales, shows little change from one year to the next. For potatoes alone, home consumption is carried over partly into the next calendar year on the basis of estimated proportions consumed.

Truck crops and forest products are a further exception to the general rule because total quantities of home consumption for these are not reported as they are for other crops. Instead, average annual values of truck crops and fuel wood consumed on a sample of reporting farms are used as measures of year-to-year change from bench-mark data supplied by the census of agriculture.

Rental value of farm dwellings.—The rental value of farm dwellings is a gross occupancy value, and it is designed to represent what would have to be paid if all the dwellings were rented separately from the farms themselves. The gross value is built up by first determining net value as an interest rate applied to estimated total sale value of the dwellings, then adding in that part of total farm expenses as is estimated to be allocable to the upkeep of the dwellings in order to put the results on a gross basis. This procedure is applied to operators' dwellings only; and results are later expanded to allow for other dwellings on farms.

The average rate of interest paid on farm-mortgage loans is used as the measure of net rental value in relation to the total market value of operators' dwellings. Annual estimates of the latter are derived from the following data: (1) the value of all farm real estate, as reported annually by the Bureau of Agricultural Economics,[36] (2) the value of all farm

buildings as reported every 5 years in the Census of Agriculture, and (3) the value of operators' dwellings as reported only in the 1930 Census of Agriculture. The value of all buildings is estimated as a percentage of total farm real estate on the basis of the latest census of agriculture; and the value of operators' dwellings is determined as a fixed percentage of all buildings on the basis of the 1930 Census.

The net rental value thus obtained is assumed to contain such mortgage-interest payments as should apply to operators' dwellings. To it are added estimated depreciation, taxes, and insurance on the dwellings to derive a gross rental value. The section below on production expenses includes discussion of methods used in estimating depreciation on operators' dwellings; methods used in estimating total real estate taxes and total insurance are discussed in the next chapter. The proportion of taxes assigned to dwellings is the same as the ratio of the estimated value of operators' dwellings to the value of all real estate, and the proportion of insurance assigned is equal to the 1930 value ratio of operators' dwellings to all buildings.

The gross rental value thus derived for operators' dwellings is inflated by a variable ratio to allow for other dwellings on farms. For 1930, the ratio used is that between the census value of all dwellings on farms and the census value of operators' dwellings alone. The ratio in other years is adjusted to reflect changes in number of families living on farms as compared with number of farms.

Net change in farm inventories.—This is a measure of the net value, at year-end prices, of physical changes during the year in farm inventories of crops and livestock. It does *not* represent the change in total value of inventories. All livestock on farms are included in this measure, but crop inventories are included only to the extent that they are held for ultimate sale. In other words, crops held for use as feed or seed on farms where grown are excluded.

Numbers and value per head of all classes of livestock on farms on January 1 of each year are as reported by Agricultural Estimates. In each case, the increase or decrease in number from January 1 of the year in question to January 1 of the following year is counted at the value per head reported for the latter date.

The quantity of each crop still remaining to be sold on January 1 of each year is estimated as the difference between the total amount to be sold from the previous year's production of the crop and the amount actually sold through December. Increases or decreases during the calendar year in the quantities thus derived are valued at average prices reported for December 15.

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[36] In *The Farm Real Estate Situation*, issued annually as a circular prepared by the Bureau of Agricultural Economics of the Department of Agriculture, 1942–43—1946–47. See chapter 21 for a discussion of the Bureau's estimates relating to farm real estate.

Commodities included in the measure of inventory change are listed below: Cattle, hogs, sheep, horses, mules, chickens, turkeys, wheat, rice, rye, buckwheat, corn, oats, barley, hay, cotton lint, cottonseed, tobacco, flaxseed, peanuts, soybeans, potatoes, sweetpotatoes, dry edible beans, dry field peas, and apples.

METHODS OF ESTIMATING PRODUCTION EXPENSES

With few exceptions, the basic data available for estimation of farm production expenses are less complete than are those that underlie the estimates of gross income. The latter are generally determined initially by States, on the basis of actual price and quantity data for each State. Wherever possible this procedure is also followed in estimating production expenses. But in about half the cases, limitations in the available data are such as to require that the initial estimate be for the United States as a whole, the resulting total being allocated among the various States in accordance with the most relevant information that can be found.

Methods discussed here are those used in deriving the Nation-wide estimates, but if these are obtained as the sum of separate State estimates, the fact is noted.[37] The following expense items are considered approximately in descending order of their dollar magnitude.

Purchased feed.—In census years, farmers' expenditures for purchased feed are as reported in the Census of Agriculture. For intercensal years, interpolations are based on changes in estimated total expenditures for 18 different commodities as follows: Corn, hay, oats, alfalfa meal, dried beet pulp, brewers' dried grains, copra cake and meal, corn gluten feed, cottonseed cake and meal, distillers' dried grains, fish meal, linseed cake and meal, peanut cake and meal, rice millfeeds, soybean cake and meal, tankage, wheat millfeeds, and dry milk for animal feed. The estimated quantity of each item purchased is multiplied by the price paid. For corn, hay, and oats, the quantity imported is added to that sold from the farm; from this amount is subtracted the quantities exported, used for industrial purposes, or fed to nonfarm livestock; and after an adjustment for changes in commercial stocks, the residual is multiplied by the farm price. For each of the manufactured feeds, domestic production plus imports, minus exports and quantity fed to nonfarm livestock, and adjusted for change in stocks, is multiplied by a retail price. A straightline interpolation of the ratio of the census total for feed expenditures and the sum of the estimates for the aforementioned 18 commodities is made for intercensal years; and this adjustment factor is used to bring the estimate for each year in line with the census totals.

Depreciation of plant and equipment.—Depreciation charges on buildings, motor vehicles, and other farm machinery and equipment are estimated to approximate the amount that farmers would have to pay each year if they had replaced, at prices prevailing during the year, the amount of plant and equipment used up in that year. Because of the durability of buildings and farm machinery and the wide variation in cash outlay from year to year, depreciation is a better measure of capital cost than cash expenditure. An excess of expenditures over depreciation charges represents a net addition to farmers' capital in the form of buildings and machinery, whereas an excess of depreciation charges over expenditures indicates that farmers have delayed the replacement of equipment and have used up a part of their capital investment.

Depreciation is estimated separately for (1) operators' dwellings, (2) other farm structures,[38] (3) automobiles, (4) motortrucks, (5) tractors, (6) other farm machinery, and (7) harness and saddlery. Only 40 percent of the total depreciation on automobiles is charged off as a production expense, on the assumption that 60 percent of the use of the average automobile on farms is for nonbusiness purposes.[39]

The method used in estimating depreciation of operators' dwellings and other farm structures starts with their total value in 1910 as shown in the census of agriculture, carries the calculation through in terms of constant prices at the 1910 level, then revalues the result at current prices, using an index of changes in cost of construction since 1910. Estimated expenditures during any given year are added to the total value of the buildings on January 1 of that year, both in terms of 1910 prices; this total is multiplied by a rate of depreciation[40] based on their average length of life.

The estimate of depreciation thus derived is

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[37] A full set of State production-expense estimates is now available only for the years 1929 and 1939-45. Methods used in the State allocation of all expense items are summarized on pages 68-85 of Part VI, section 1, INCOME PARITY FOR AGRICULTURE. (See footnote 28, p. 146). For 6 of the more important categories, more detailed information than is provided here may be found in Part II of INCOME PARITY FOR AGRICULTURE as follows: Section 1—Hired labor; 2—Fertilizer and lime; 3—Depreciation of motor vehicles, machinery, and equipment; 4—Motor-vehicle operating costs; 5—Depreciation of farm buildings; and 6—Farm-property taxes.

[38] Including fences, windmills, and wells in addition to service buildings and dwellings not occupied by the operator of the farm.

[39] The percentage of depreciation charges to production was stepped up to 50 percent during the recent war years as a result of gasoline rationing for nonessential uses.

[40] 3.6 percent is used for operators' dwellings, 6 percent for other farm structures.

also in terms of 1910 prices. When it is subtracted from the previous total, the next January 1 value is obtained. When revalued at current prices, the appropriate capital cost of current production is the result. The cost-of-construction index used for revaluation represents wage rates of hired labor and prices paid for building materials, with the latter part of the index varied in its composition for application to operators' dwellings on the one hand and "other structures" on the other hand.

This procedure requires annual estimates of total expenditures on farm buildings, and a break-down of the total as between expenditures on operators' dwellings and expenditures on other farm structures. For the years 1934-37, 1939, and 1946, both are based on miscellaneous surveys relating to farm construction. Estimates for other years are in part derived from annual census reports on factory-made equipment for farm use.[41] But for the most part, they can only be approximated from changes in farm construction costs and changes in such indicators of physical volume as (1) lumber consumption on farms, (2) sales of building materials in rural areas, and (3) nonfarm residential construction.

Methods used in estimating depreciation on motor vehicles and other types of farm machinery and equipment are essentially the same as those described above for farm buildings, except that no attempt is made to carry the calculations through in terms of constant prices. Depreciation rates—applied to estimated current value of machinery on farms at the beginning of the year plus the value of purchases during the year—are based on studies of the length of life of each type of machine. And in some cases, allowance has been made for a gradual increase in average length of life.

Again, estimates of annual expenditures are an essential first step. In the case of automobiles and motortrucks, annual expenditures are based on a variety of data and assumptions relating to changes in numbers on farms, rates of replacements, proportions purchased new and second-hand, number of new owners, prices paid, and allowances for trade-ins. For tractors and other types of machinery and equipment, farmers' expenditures are generally estimated from the annual Census of Manufacture and Sale of Farm Machinery and Equipment. Factory values reported therein are first adjusted to allow for imports, exports, and sales to nonfarm users; and the results are then marked up to a retail level to indicate the total cost to farmers.

Hired labor.—The cost of hired farm labor is estimated separately for (1) cash wages paid, (2) cost of board and lodging, and (3) cost of other perquisites furnished to hired laborers. Only cash wages are estimated initially by States.

Cash wages are as reported in the census of agriculture, with estimates for other years derived from an index-number series representing the product of average farm-wage rates and average employment.

The cost of board and lodging was obtained in two of the earlier census enumerations and in a sample survey conducted several years ago. Estimates for other years are obtained from percentage changes in the product of (1) average employment with board, and (2) the difference between average wage rates with and without board, with the latter taken as representing the average cost of board and lodging.

The cost of other commodities and privileges received by hired farm workers as perquisites in addition to cash wages was derived from data collected in two widely separated surveys. Estimates for other years are obtained with the aid of an index-number series showing changes in employment of hired farm laborers and changes in farm prices of the more important perquisite items.

Wages are a cost to the farm operator, but they are also income to the hired worker. To obtain the income from farming operations of all persons living on farms, it is therefore necessary to distinguish wages paid to laborers who live on farms from those paid to nonresident laborers. The estimates are broken down largely on the basis of data collected in the 1930 Census of Agriculture. Cash wages are divided in proportion to numbers of hired farm workers living on and off farms, but a much greater proportion of the cost of board and lodging and other perquisites is assigned to resident laborers.

Motor-vehicle operating costs. — Operating costs are estimated separately for farm automobiles, motortrucks, and tractors. They include the cost of gasoline and other fuel, motor oil, grease, tires and tubes, repairs, licenses, and insurance. Only 40 percent of the total cost for automobiles is charged to farm production.

In general, the average of each type of cost per vehicle is estimated first, their sum is then multiplied by the number of vehicles on farms. Numbers are reported in the census of agriculture. Estimates for other years, in the case of automobiles and trucks, are derived from changes in total registrations in predominantly agricultural States, and from actual assessors' records on farm vehicles in a few States. Numbers of tractors are interpolated on the basis of estimated sales of new tractors to farmers,

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[41] Electric lighting systems, barn and barnyard equipment, windmills, silos, domestic water systems, farm gates, etc.

after an allowance for the scrapping of old ones.

The cost of gasoline and other fuel is based on prices paid and average consumption per vehicle. The prices used allow for tax exemption to the extent that gasoline is used for production purposes; prices for tractor fuel reflect kerosene or distillate as well as gasoline. Consumption is determined from survey data and occasional spot checks on average annual mileage and average mileage per gallon in the case of automobiles and trucks, and on average number of days used per year and fuel consumption per day in the case of tractors.

The cost of motor oil is determined from prices paid, allowing for the use of cheaper grades in motortrucks and tractors, and from quantities estimated on the basis of their relationship to fuel consumption. The cost of other oil and grease is then added simply as a fixed percentage of the cost of motor oil for tractors.

A survey conducted in 1936 provided bench-mark estimates of the average cost of tires and tubes per automobile and per truck. Estimates for other years in the case of automobiles are based on changes in prices paid by farmers and changes in a national average replacement rate for tires and tubes.[42] The cost per truck is extrapolated on the assumption that the cost per mile, as indicated in the survey, continues to be 67 percent greater than the cost per mile for automobiles. The estimates for tractors, including an allowance for tires on other machinery, are based directly on replacement shipments as reported by the Department of Commerce and on average prices paid by farmers.

Bench-mark estimates of the average cost of repairs for each type of vehicle were also obtained from the 1936 survey. Estimates for tractors in other years are derived from (1) changes in the deflated factory value of all tractor parts sold, as indicative of the quantity factor, and (2) changes in wage rates of automobile mechanics.[43] Extrapolations in the case of automobiles and trucks can only be approximated on the basis of changes in wage rates and certain arbitrary assumptions concerning the average age of the vehicles.

The average cost of license fees for farm automobiles and trucks is assumed to be the same as the national average derived from data supplied by the Bureau of Public Roads. Insurance premiums shown in the 1936 survey are assumed to vary with other types of farm-insurance premiums.

Net rent to nonfarm landlords.—State estimates of total farm rents, both gross and net, are discussed in the next chapter. Gross rent represents cash and share rent, and includes that part of Government payments that goes to the owner of a farm instead of its tenant operator. Net rent is after the deduction of taxes, insurance, depreciation, and such miscellaneous operating costs as may be borne by the landlord instead of the operator.

Only net rents paid to landlords who are not also farm operators are considered as an expense of production for farm operators as a group. Net rents as a whole, and Government payments included therein, are broken down as between farm and nonfarm landlords on the basis of sample surveys of farm tenancy and rental arrangements covering the years 1936 and 1945.

But for inclusion in the aggregate farm income and expense account, net rent to nonfarm landlords must be further adjusted to eliminate any farm-mortgage interest that is paid by nonfarm landlords—because such interest will already have been deducted as an expense of production in estimates of total farm-mortgage interest. In making this adjustment, interest paid on all rented farms is first estimated on the assumption that its ratio to total mortgage interest is the same as the ratio of mortgage debt on rented farms to total farm-mortgage debt. After an adjustment to allow for rented farms owned by banks and other lending institutions—which are assumed themselves to be free from mortgage debt—the result is broken down as between farm and nonfarm landlords in the same proportion as their net rents.

Purchased livestock.—Farmers' expenditures for livestock are estimated separately by States. They include purchases of stocker, breeder, and feeder meat animals—cattle and calves, hogs, and sheep and lambs—from all sources outside the State and from livestock markets within the State as reported by Agricultural Estimates. They also include the cost of hatching eggs and an adjustment for the purchase of day-old chicks. Purchases of horses and mules are considered elsewhere.

The quantity of eggs purchased for hatching is derived from the number of chicks hatched by commercial hatcheries; and their cost is estimated at a price 12 cents per dozen higher than the average price received by farmers for all eggs.

The cost of day-old chicks is not included as such in the Nation-wide estimates of production expenses because receipts from the sale of chicks are not included in gross income. But

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[42] This replacement rate represents total domestic sales for replacement purposes, as reported by the Department of Commerce, divided by total registrations as reported by the Bureau of Public Roads.

[43] From (1) Censuses of Manufacture and Sale of Farm Machinery and Equipment, and (2) the Bureau of Labor Statistics.

a small proportion of chicks sold by farmers is not bought by other farmers; and the value of sales is a little larger than the value of purchases for all farmers as a group. So expenditures for livestock purchases are adjusted downward by the difference.

Taxes, interest, and insurance.—Taxes on farm property, interest on outstanding indebtedness, and net property-insurance premiums are deducted as expenses of production. Separate estimates are made for (1) real estate taxes, (2) personal property taxes, (3) farm-mortgage interest, (4) short-term interest paid to commercial banks and Federal agencies, (5) short-term interest paid to noninstitutional lenders, (6) premiums on fire insurance, (7) premiums on windstorm insurance, and (8) premiums on hail insurance.

The more important of these are estimated initially by States, using sources and methods that are discussed in the next chapter.

Fertilizer and lime.—Expenditures for fertilizer and lime are estimated separately for each State. The cost of commercial fertilizers is derived from quantities reported in trade sources [44] and average prices paid by farmers. In the case of fertilizer distributed by the Government, both quantity and price of each type are as reported by the Production and Marketing Administration.[45] This agency is also the source of data as to quantity and price of lime purchased by farmers.

Seeds and nursery stocks.—The cost of seeds and nursery stock purchased by farmers is estimated separately in 33 categories. In the absence of any data on either prices or quantities for vegetable seeds and nursery stock, the estimate for these items derived from the 1930 Census of Horticulture is extended to other years in a lump sum on the basis of relative changes in the combined gross income from truck crops, sweetpotatoes, fruits, and tree nuts. Estimates for the other 32 kinds of seed are each derived by applying retail prices as of the months when most seeding is done to estimated quantities purchased. But the method used in obtaining price and quantity data vary somewhat among the different types of seed. Data are as reported by Agricultural Estimates unless otherwise indicated.

For flaxseed, peanuts, wheat, cowpeas, rye, soybeans, and potatoes, quantities purchased are derived simply as the difference between volume of production for seed and quantities used for seed on farms where grown. In the case of cottonseed, quantity is estimated by

applying an average seeding rate to the total acreage of cotton in cultivation on July 1. Prices used in the case of cowpeas, soybeans, potatoes, and cottonseed, are those paid by farmers as reported by seed dealers on March 15. Prices for the other types of seed in this group are prices received by farmers in the month of seeding plus an estimated percentage mark-up to the retail level.

Total expenditures for hybrid seed corn are derived by multiplying average retail prices for the period from February through May by the quantity purchased, the latter having been determined from an average seeding rate and the total acreage of corn planted with hybrid seed. But only a fraction of the result is considered to be a net cost to farmers. Most of this type of seed is grown by farmers under contract with seed dealers; the extra income of these farmers has not been counted in total gross income, so only the difference between that premium and the total expenditure for hybrid seed should be counted as a cost.

For other types of seed not specifically mentioned above, retail prices obtained from the price lists of important seed houses are applied to certain percentages of the total "domestic disappearance." The latter is the quantity of seed produced for sale by farmers after adjustment for imports, exports, and changes in stocks on hand. And it is assumed that purchases by farmers bear the same relationship to total disappearance as sales by farmers to their total production.

Containers.—The total cost of fruit and vegetable containers is estimated as the sum of the cost for each of 35 different fruits and vegetables. The initial estimates were based on a survey made in 1936, and estimates for other years are projected from these on the basis of changes in container prices and changes in the quantity of each commodity sold fresh or produced for commercial sale.

Irrigation.—The cost of irrigation water, including overhead costs as well as current operating expenses, is estimated from data collected in the decennial Census of Irrigation. For noncensus years, however, no information bearing directly on irrigation costs is available. So estimates for these years are derived from the latest census-year estimate on the basis of changes in (1) harvested acreage of representative crops in the 19 States where irrigation is important, as a measure of the quantity factor, and (2) farm-wage rates in those States as a measure of the price factor.

Dairy supplies.—Miscellaneous costs incurred by farmers in production of dairy products include payments for milk cans, pails, strainers, bottles and caps, ice, fly sprays, equipment and fuel for sterilizing utensils, disinfectants and

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[44] National Fertilizer Association. *Fertilizer Review.* Quarterly, Washington, D. C.

[45] But the average freight rate from Muscle Shoals, Alabama, is the only price applied to fertilizer from the Tennessee Valley Authority.

washing powders, registration fees, cow-testing fees, and membership fees in dairy-herd improvement associations. On the basis of a review of State experiment station bulletins on organization and management of dairy farms during the period 1935-38, a bench-mark estimate of the total cost of these items was made for the year 1938. Estimates for other years are derived from relative changes in two index series, with equal weight assigned to each. One of these indexes represents 2 percent of the value of sales of butter and butterfat plus 4 percent of the value of milk sold at wholesale and milk and cream sold at retail—a relationship to cost that was observed during the years studied. The second index represents the product of three other series: (1) the number of dairy cows on farms, (2) prices paid by farmers for equipment and supplies, and (3) an estimated quantity of supplies purchased per cow.

Blacksmithing and hardware supplies.—This category includes the cost of horseshoeing and other blacksmith work (sharpening machinery parts, welding, etc.) and the cost of miscellaneous hardware supplies (carpenter tools, wrenches, wire stretchers, greasing equipment, etc.). A bench-mark estimate for horseshoeing was provided in a survey made in 1929; estimates for other years are derived from relative changes in number of horseshoes manufactured, as reported in the census of manufactures, times the estimated average cost of shoeing.

The average combined cost of other blacksmith work and miscellaneous hardware supplies was estimated at 10 cents an acre in 1910-14. Estimates for later years apply this rate, after adjustment for changes in prices paid by farmers for machinery, to the annual crop acreage.

Ginning.—The cost of cotton ginning is obtained by applying appropriate rates per bale, as reported by the Production and Marketing Administration, to the production of cotton lint in each State.

Veterinary services and medicine.—The cost of veterinary services and medicine is estimated for each type of farm animal on the basis of (1) the number of animals on farms each year and (2) the average cost per animal as revealed in a survey made in 1936. In the case of hogs, however, the current estimates are checked against quantities and prices of serum and virus as reported by the Bureau of Animal Industry.

Twine and wire.—The cost of twine and wire is estimated separately for each crop that is harvested by methods requiring their use; then, a small fixed percentage is added to the total for twine to allow for its other uses on farms.

Prices paid by farmers for twine and wire are as reported by Agricultural Estimates or in trade sources. The quantity used in harvesting each crop is estimated from the annual acreage or production of the crop on the basis of detailed survey data showing (1) the proportions of acreage or production harvested by different methods, and (2) average rates of consumption of twine or wire in each case.[46]

Greenhouse and nursery supplies.—Many costs are incurred in greenhouse and nursery production that are not included in other farm-expense categories—such as plants, seeds, bulbs, pots, fuel, advertising, materials for packaging and tying, commissions, etc. Annual estimates of expenditures for all these items combined are based on the assumption that they bear the same relationship to cash receipts from greenhouse and nursery products as was shown in the 1930 Census of Horticulture.

Electricity.—Estimates of the cost of electricity are designed to represent all charges arising from farm-production activities other than irrigation. Charges for electricity used in irrigation are included in that category.

Trade sources in the electric light and power industry provide data as to number of farms using electricity and average bill per farm.[47] The total number of farms using electricity is multiplied by the average cost for farms east of the 100th meridian, on the assumption that higher costs farther west are due to electricity used in irrigation. Twenty-five percent of the result is charged to production.

Insecticides and fungicides.—The cost of insecticides and fungicides is estimated separately for cotton, tobacco, 13 varieties of vegetables, and 18 varieties of fruits and nuts. Livestock sprays are not included here as they come under "veterinary services and medicine."

The 1935 cost for each of these 33 commodities was determined from the results of a survey conducted in 1936. Estimates for other years are derived from these on the basis of changes in quantity—as indicated by the number of trees or vines in the case of fruits and nuts and by acreage harvested for all other crops—and changes in a specially constructed index of prices paid for insecticides and fungicides. This index is a weighted average of wholesale prices as reported in trade sources.[48]

Miscellaneous.—Other cost items, applicable for the most part on relatively few farms, include (1) sugar tolls, (2) operating costs for gasoline and steam engines, (3) grazing fees,

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[46] See the following B.A.E. publications: (1) HARVESTING THE CORN CROP, 1945; (2) HARVESTING THE HAY CROP, 1946; and (3) HARVESTING SMALL GRAINS AND UTILIZATION OF THE STRAW, 1947.

[47] Edison Electric Institute. THE ELECTRIC LIGHT AND POWER INDUSTRY IN THE UNITED STATES. Annual.

[48] *Oil, Paint, and Drug Reporter.* Weekly. New York, N. Y.

(4) purchases of horses and mules, and (5) crop insurance. The dollar size of each is quite small in contrast with the expense items already considered.

Tolls on sugarcane and sorgo sirup represent the value of sirup given to mills in exchange for extraction services. The amount of these tolls is derived by multiplying the value of production in each State by appropriate percentages furnished by Agricultural Estimates.

The cost of operating gasoline engines is the product of the number on farms and the average cost per engine. Numbers have been interpolated between estimates of the Bureau of Agricultural Engineering for earlier years and a recent count obtained from a sample of the 1945 Census of Agriculture. The cost per engine assumes an average annual consumption of 60 gallons of gasoline and 3 of oil, valued at current prices paid. The operating cost of steam engines on farms, always a small item, has been negligible in recent years as nearly all steam engines have been replaced by tractors.

Grazing fees in each State are the sum of fees reported by the Forest Service and by the Bureaus of Land Management and Indian Affairs in the Department of the Interior.

The cost of horses and mules purchased is a net cost representing the excess of purchases over sales, as reported by Agricultural Estimates, in each State where purchases are larger than sales. If sales are larger than purchases, the difference is added to cash receipts from marketings in that State.

Cost of crop insurance is also a net cost representing the excess of premiums over indemnities for each crop insured in each State as reported by the Federal Crop Insurance Corporation. The item is negative in years when indemnities exceed premiums.

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In addition to those mentioned previously, statistical series of publications originating within the Bureau of Agricultural Economics, cover a wide field of subjects. Some involve collection of primary data; others make use of materials already collected. In all cases the series discussed represent major contributions of the Bureau. These estimates, which are prepared by the analytical divisions of the Bureau, are described briefly as in most cases detailed explanations are available in other publications of the Bureau.

The series described in this chapter include the following:

A. Financial Series: (1) The balance sheet of agriculture, (2) index of farm real estate values, (3) indexes of deposits of country banks, (4) farm-mortgage credit, (5) farm-mortgage interest rates and charges, (6) farm tax series, (7) farmers mutual fire insurance, (8) farm fire losses, (9) gross and net rent due landlords, (10) labor returns, and (11) farm-retail price spreads for farm products.

B. Miscellaneous Series: (1) Index numbers of farm output and gross farm production, (2) farm labor requirements, (3) number of farm machines, (4) number of farms changing hands by various methods, (5) animal units of livestock fed annually, (6) farm population, and (7) domestic food disappearance.

THE BALANCE SHEET OF AGRICULTURE

This series (1940 to date) presents as of January 1 of each year the consolidated assets and claims relating to agriculture, as though the industry and the households on farms were one vast enterprise. Aggregate values of physical assets of agriculture, principal financial assets of people living on farms, farm-mortgage debt, non-real-estate debt of farm operators, and residual equities of proprietors (owner and tenant operators and landlords) are separately itemized. In general, the values of physical assets are in terms of current prices of each year.

Physical assets

With the exception of household equipment, the balance sheet values reported for physical assets are taken from the regularly published series of the Bureau of Agricultural Economics. These series are described in this publication

as follows: Real Estate, chapter 21; Livestock, chapter 11; Machinery and Motor Vehicles, chapters 20 and 21; and Crops Stored on Farms, chapter 8.

However, in the Balance Sheet of Agriculture, crops stored off farms are included with those stored on farms. The value of off-farm storage is limited to crops held in warehouses as security for loans guaranteed by the Commodity Credit Corporation.

Household equipment is from an unpublished and tentative set of estimates of the Bureau of Human Nutrition and Home Economics. Valuations are as of a 1940 base, plus purchases and additions caused by migration to farms, less depreciation and subtractions caused by migration away from farms.

Financial Assets

Annual estimates of the amount of commercial bank deposits (separate estimates for demand and time deposits) owned by farmers have been made by this Bureau for the period January 1, 1940, to date. The estimates are based on the percentages of farmer-owned to total deposits reported by banks in 1931 in a Nation-wide inquiry and on the growth of deposits in commercial banks located in places of various sizes.[49]

In the meantime, the Board of Governors of the Federal Reserve System developed its semi-annual estimates of ownership of demand deposits of individuals, partnerships, and corporations. Beginning with July 31, 1943, separate estimates were made of farmer-owned demand deposits. This series, as revised and adjusted to a January 1 basis, was substituted for estimates of farmer-owned demand deposits made by this Bureau for the period 1944-49 and they will be used hereafter. Estimates of farmer-owned time deposits made by this Bureau will continue to be used in the Balance Sheet of Agriculture.

These series are estimates of the amount of commercial bank deposits owned by persons whom bankers classify as farmers. Presumably

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[49] The method is described in detail in Tostlebe, Alvin S., Horton, Donald C., Burroughs, Roy J., Larsen, Harald C., Jones, Lawrence A., and Johnson, Albert R., under the direction of Norman J. Wall. Impact of the war on the financial structure of agriculture. U. S. Dept. Agr. Misc. Pub. 567, pages 185-195.

most such persons are active farmers or members of farm families. However, the estimates may include deposits of some absentee landowners whose principal incomes are from farms, and they probably exclude deposits of persons living on farms who are not principally engaged in farming.

Annual estimates, from 1940 to date, of the currency held by persons living on farms have been based on surveys of liquid asset holdings made by the Board of Governors of the Federal Reserve System. In the estimates, the same per capita holdings of currency are ascribed to persons living on farms as to other segments of the population, excluding business firms.

Annual estimates of the amount of United States Savings Bonds owned by persons living on farms have been made by this Bureau for the period 1940 to date. The estimates for series A-E bonds are based on sales and redemptions in a large number of primarily agricultural counties as shown by data collected by the United States Treasury. Aggregate sales and redemptions in the sample counties of each crop-reporting district are reduced to a per capita basis, and the per capita sales and redemptions are then multiplied by the number of persons living on farms in the crop-reporting district. Resultant figures for the various crop-reporting districts are combined into geographical area totals as well as a United States total. The difference between sales and redemptions as thus computed for each geographical area, after adjustment for interest accrual, is taken as the outstanding amount of series A-E bonds held by the farm population of the area.

Due to the large number of institutional purchasers of series F and G bonds, it has not been considered feasible to use the method described in estimating the amount of series F and G bonds held by the farm population. Instead, sales of such bonds to persons living on farms have been estimated at the rate of 1 dollar of F and G bonds for each 6.14 dollars of E bonds purchased by the farm population (the rate assumed before 1946 was 1 to 11).

Redemptions of F and G bonds by the farm population are estimated at the rate of two-thirds of the redemption rate of such bonds for the entire population. Estimates for sales and redemptions, and the resultant estimate of F and G bonds currently held by the farm population are made only for the country as a whole, not for geographical areas.

Annual estimates of the farmer-owned part of the net worths of farmers' cooperative associations have been made by this Bureau for the period 1940 to date. Figures for the cooperative credit associations, such as the land-bank and production-credit systems, are reported currently by the Farm Credit Adminis-

tration and require no estimating procedure except adjustment of some data from a June 30 to a January 1 basis. Figures for the rural electrification associations are supplied by the Rural Electrification Administration. Estimates for cooperative purchasing and marketing associations are based on the results of a survey made in 1937 by the Farm Credit Administration, showing the condition of such associations at the end of the most recently completed fiscal year, and on later statements from a large sample of the associations which report annually to the Farm Credit Administration. Estimates for farmers' mutual fire insurance companies are based on information filed by the companies with the State Insurance Commissioners and on supplemental data supplied by the companies to this Bureau. For other types of associations, such as farmers' mutual irrigation and mutual telephone companies, estimates are based on fragments of data collected from various sources.

Although variously designated as "Farmers' Financial Interest" or "Farmers Investment" in cooperative associations, this series has indeterminate coverage. With available data, it has been possible to estimate only the net worths of the associations, excluding any parts owned by the United States Government. The privately owned net worths of farmers' cooperative associations are doubtless chiefly owned by active farmers, but there must be extensive ownership by other rural residents, as in the case of rural mutual telephone companies, and by urban patrons who own farm land as in the case of the Federal land banks.

Claims

The real estate mortgage debt is reported in the series described later in this chapter. Non-real-estate debt of farmers to principal lending institutions is reported by these institutions. Non-real-estate debt of farmers to others, such as merchants, dealers, and individuals, is recognized by an estimate based on fragmentary bits of information and on trends of producer and consumer loans made by reporting lending agencies such as banks, finance companies, and Federal agencies.

Proprietors' equities include the net value, after deducting all debt, of (1) rights of landlords, (2) owner operators, and tenant operators in the physical farm assets, and (3) the various rights, chiefly of people living on farms (including some nonoperators), in the financial assets included in the Balance Sheet of Agriculture.

INDEX OF FARM REAL ESTATE VALUES

Dollar values of all farm land (including improvements) are expressed as index numbers

for the various States, regions, and the United States, using 1912-14 and 1935-39 as base periods. An index of land values is also calculated for 7 major type-of-farming areas which cut across State lines.

This series is based on estimates made by crop reporters in March, July, and November. The reporters are asked to give an estimate of the average value of all farm land (including improvements) in their locality. They are instructed to omit from consideration all lands affected by use as, or offered for sale as, town or suburban lots, resorts, or country homes, and all land whose value would be influenced by such nonagricultural uses as timber, minerals, oil, and the like.

In the 11 Mountain and Pacific Coast States separate estimates are obtained for irrigated, dry-land farming, and grazing lands to show estimated values "now" and "a year ago." Elsewhere, the request is for a single figure to indicate the average market value of all farm land as of the reporting date. As such estimates are based only to a limited degree on selling prices, the index derived from them is considered to be an index of farm real estate values rather than one of farm real estate prices. The purpose of the index is to measure trends and changes in the general level of values. It is not intended to measure average selling prices for the relatively few farms that change hands.

The number of acres in farms, as taken from the 1925 Census, is used in calculating a weighted average dollar value per acre for the various States, geographic divisions, and the United States. In the Western States, the "now" and "a year ago" figures are used to compute a ratio of change for each class of land and this ratio is applied to a previously established per acre value. This procedure eliminates much of the random variation due to the relatively small number of reports obtained for the various classes of lands in these States. The separate estimates for the three types of land are then combined into a single average value per acre of all land, using as weights the acreage of each class of land taken from the 1930 census. The dollar values then obtained for the Western States are combined with averages for the other geographic divisions, using the 1925 census weights, to yield a weighted average dollar value per acre for the United States. Weights used in combining the various crop reporting districts into farming areas are the same as those used in the Bureau's State index series.

INDEXES OF DEPOSITS OF COUNTRY BANKS

Monthly and annual indexes of demand, time, and total deposits of member banks of the Federal Reserve System located in places of less than 15,000 population in 20 leading agricultural States are available for the period 1924 to date. The period 1924-29 is taken as the base. The monthly index of demand deposits for the 20 leading agricultural States is in two forms, unadjusted for seasonal variations and adjusted. Unadjusted indexes are available for groups of States as follows: 5 Corn Belt States, 8 cotton-growing States, 8 Mountain States, 3 Lake States, 4 Great Plains States, and Texas-Oklahoma. Indexes of time and total deposits likewise are available for these various geographic groups, but without adjustment for seasonal variations.

The deposit series for each State is weighted in proportion to each State's cash farm income in the base period. Interbank deposits are excluded from the basic data.

In agricultural areas interrelationship between cash receipts of farmers and those of the rural community as a whole is very close. Hence, an index for banks located in the smaller towns is believed to reflect the direction of change and to a considerable degree the amplitude of changes in farmers' deposits. However, shifts in ownership of country bank deposits between farmers and nonfarmers is not reflected in the index. Moreover, the index is not corrected for Government war loans accounts, which at one time gave the demand-deposit index an upward bias of at least 18 percent. The effect of weighting the index for cash farm income in each State has been consistently small throughout the years.[50]

FARM-MORTGAGE CREDIT

Estimates of outstanding farm-mortgage credit represent the amount of credit secured by farm real estate, regardless of the purpose for which funds are used. Furthermore, they represent credit extended under all types of loan instruments—mortgages, deeds of trust, vendors' liens, or sales contracts—so long as the security offered is farm real estate.

Estimates of the total amount of farm-mortgage debt outstanding at the beginning of each year, by States, begin with 1910. Amounts of loans held by selected lender groups are also available back to 1910. Estimates of the total number of mortgaged farms, by tenure of farm operator, have been prepared for 1930, 1935, 1940, and 1945.

Census-year estimates of debt and number of mortgaged farms are based on information obtained in the census for owner-operated farms (full-owner farms only for years before

[50] For an analysis of these series see Wall, Norman J., Demand deposits of country banks, U. S. Dept. Agr., Tech. Bul. 575, 1937, and Indexes of Deposits of Country Banks. U. S. Bur. Agr. Econ., Agr. Finance Rev., Vol. 7, 1944.

1940), mailed inquiries sent out jointly by Bureau of Agricultural Economics and the Bureau of the Census, and information obtained from selected lending agencies.

Estimates for intercensal years are based on published information showing the amount of farm mortgages held by certain lending agencies and on estimates of the amount of mortgages recorded and released annually by other lender groups. Data for Federal land banks, the Federal Farm Mortgage Corporation, the Farmers Home Administration, and joint-stock land banks are taken from official publications. Those for life insurance companies are estimates of the Bureau of Agricultural Economics, based on data obtained from companies holding a substantial proportion of all loans of life insurance companies. Data for banks before 1935 are based on special surveys in 1914, 1918, 1921, 1924, and 1931 and on data relating to farm mortgages recorded and released. Data for banks since 1935 are those reported by the Federal Deposit Insurance Corporation for insured banks. Estimates for individuals and miscellaneous lenders are based mainly upon mortgages recorded and released by these groups. At each census year a bench-mark estimate is made, and intercensal estimates are revised back to the previous census year.

FARM-MORTGAGE INTEREST RATES AND CHARGES

Farm-mortgage interest rates represent contract rates except for the period 1934-44, when the temporarily reduced rates for the Federal land banks are used, and for the period 1938-45, when the temporarily reduced rates for the Federal Farm Mortgage Corporation are used. Estimates of interest charges represent the amount payable during the calendar year. Data concerning interest rates and interest charges on total farm-mortgage debt are available by States back to 1910.

Most of these data are based on sources other than census enumerations. Interest rates on mortgages recorded during the year are from two sources. Those for years since 1935 are compiled biennially from data obtained by the Farm Credit Administration for the month of March. For 1935 and earlier years the data were obtained in a Nation-wide Works Progress Administration project sponsored by the Bureau of Agricultural Economics.

Rates on mortgages outstanding at the beginning of the year for years since 1936 are based on data on farm mortgages recorded, special surveys by the Bureau, and reports from lender groups. For earlier years the rates are based on census enumerations and data obtained in a Nation-wide WPA project for mortgages recorded during the year. Estimates of average interest rates on outstanding mortgages for these earlier years are made on the assumption that mortgages were outstanding during the full term for which they were written.

The series on amount of interest charges payable was developed from estimates of farm-mortgage debt outstanding at the beginning of the year and the average interest rate charged thereon, except in the case of the Federal agencies. Calendar-year estimates are obtained by averaging the charges computed on debt outstanding at the beginning of the year with charges computed on debt outstanding at the end of the year. For Federal agencies, interest charges are reported by these agencies.

FARM TAX SERIES

The farm tax series now regularly published by the Bureau of Agricultural Economics include taxes levied or paid by farmers on real and personal property, Federal income taxes, and State automotive taxes.

Taxes levied on farm property.—These series cover all ad valorem taxes levied upon farm property by State and local governments. They do not include special assessments such as those levied on a per acre or other benefit basis by drainage, irrigation, or other special districts. The annual farm real estate tax series show by States and regions (1) amount per acre, (2) index numbers of amount per acre (1909–13 = 100), and (3) amount per $100 of value. Personal property taxes are United States totals and are not broken down into State figures.

Farm real estate is all land that falls within the Bureau of the Census definition of land in farms. Farm personal property covers all livestock, machinery, automobiles, trucks, produce, and household and personal effects. Much personal property on farms is not taxed because some States provide a flat dollar exemption or they exempt certain classes of personal property entirely.

The real estate tax series are developed by the Bureau of Agricultural Economics from sample farm data obtained from local tax officials or from farmers themselves, and from farm real estate tax data reported by the agricultural censuses. Acreages used in computing taxes per acre are census enumerations of land in farms with interpolations for intercensal years. Values used in computing taxes per $100 of value are based on census enumerations of operator estimates of value with interpolations for intercensal years based on the Bureau of Agricultural Economics index of farm land values.[51]

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[51] For a more detailed discussion of the method used in constructing these series, see Jackson, Donald, and Isaac, Gerhard J., Farm property taxes and their relation to parity determinations. Bur. Agr. Econ., 1941. [Processed.]

The personal property tax series is developed by the Bureau of Agricultural Economics from the annual figures for total real estate taxes and the ratios between the amounts of farm real and farm personal property on the tax rolls as shown in published reports of State tax commissions, boards of equalization, or similar bodies.[52]

Taxes shown include those levied upon farm property whether owned by the operator or not. To the extent that nonfarm landlords own and pay taxes on farm property, the figures are greater than are the taxes paid by farmers. "Levies" rather than "payments" are shown partly because data for payments are not available for many States. For short periods and in particular States, levies and payments may differ widely. Over long periods and for the country as a whole, however, levies and payments probably are about equal. The figures, therefore, can be said to represent property tax charges against the agricultural industry.

State automotive taxes paid by farmers.— The series for State motor vehicle licenses and permits includes payments of all registration and "tag" fees for automobiles and trucks on farms and for drivers' permits by farmers. Estimates have not been made for years before 1910, as the number of vehicles on farms was very small and registration charges were low. The increase in amount paid by farmers since 1910 reflects both the increase in number of vehicles on farms and the increase in average charge per vehicle. The latter increase resulted partly from a long-time trend toward increasing the tax contribution of motor-vehicle owners and partly from a tendency to simplify administration by adjusting license fees upward, then exempting motor vehicles from the property tax. The license and permit series is derived from Bureau of Agricultural Economics estimates of vehicles on farms and average charges per vehicle. The latter is the average charge for all vehicles registered, adjusted to the level of charges for vehicles on farms as determined from special surveys.

The State motor-fuel taxes are those arising out of the use of automobiles and trucks by farmers. For practical purposes they may be considered as paid by farmers, although in many States these taxes technically are levied upon the distributor or dealer. The taxation of motor fuel began in 1919 when four States adopted gallonage taxes on gasoline. By 1929 all States had such taxes. The motor-fuel tax series is derived from Bureau of Agricultural Economics estimates of fuel consumption of farm vehicles and the average tax rate on such fuel as developed from special surveys.[53]

Federal income taxes paid by farmers.—This series represents total Federal income-tax payments of farmers during the calendar year, and it largely reflects liability growing out of income received during the previous year. The series goes back only to 1941 because this tax, so far as farmers are concerned, is essentially a World War II phenomenon. As recently as 1939, the Bureau of Internal Revenue reported only about 140,000 farm businesses in the "farming" category in its classification of individual tax returns by industries. By 1941, however, the farming category contained a total of more than 1,160,000 returns.

Later figures are not available and tabulations of the Bureau of Internal Revenue do not show amounts of income taxes paid by various economic groups. Thus, in order to arrive at approximate income tax payments of farmers, it was necessary to resort to other data. The series is now based upon available data on income distribution and tax payments made by sample groups of farmers. Figures are available only for the United States as a whole and are not broken down by States or Divisions.

FARMERS' MUTUAL FIRE INSURANCE

Included in this series are number of farmers' mutual fire insurance companies, amount and cost of insurance, and surplus and reserves, by States and by years. Data are for "farmer" companies which insure against fire and lightning, but, in most cases, not against windstorm, hail damage to growing crops, and other hazards. For the period 1914-33, farmer companies were defined as those which had more than 65 percent of their insurance on farm property. For the years since 1933, farmer companies were defined as those which had more than 50 percent of their business on farm property. During both periods, however, all business of such companies was considered farm business, although only about 86 to 88 percent of the total insurance was on farm property. On the other hand, general-writing mutual and stock fire insurance companies also write insurance on farm property; but the business done by such companies is not included, as they do not come within the definition of a "farmer" company.

Data are compiled from published State reports and from data supplied by State insurance officials, company officials, and others. The number of companies indicated is the number for which data were obtained and it may not

[52] A discussion of this series appears in Isaac, Gerhard J., Personal property taxation and the farmer. U. S. Bur. Agr. Econ., Agr. Finance Rev., Vol. 3, No. 2, November 1940.

[53] Further discussion of these series appears in Isaac, Gerhard J., Automotive taxes and the farmer. U. S. Bur. Agr. Econ., Finance Rev., Vol. 4, No. 2, November 1941. [Processed.]

be entirely complete for any year. The amount of net assets or reserves shown represents the excess of assets over liabilities. Most farmers' mutuals are assessment companies and, as such, they are not required to set up unearned-premium reserves. "Costs per $100 of insurance" does not include any amounts collected from members which have been added directly to surplus or reserve funds. Such funds are available for payment of future losses and operating expenses. The average increase in these reserve funds, during the 10 years 1935-44, suggests that annual assessments collected from members averaged about 11 percent higher than did the amounts actually paid out for losses and operating expenses.

FARM FIRE LOSSES

This series, which begins with 1937, includes losses from fire and lightning on farms, as defined by the Agricultural Census. Losses included are those in connection with buildings, implements and machinery, livestock, stored crops, and household goods.

For census years, losses are estimated by applying to census valuations (1) operating experience of farmers' mutual fire insurance companies, and (2) rate data compiled by State rating and inspection bureaus.

For intercensal years, losses for a current year are estimated by multiplying the estimated percentage change in farm mutual losses for that year by the total farm fire loss estimate for the previous year or by the bench-mark estimate. As there is a 2-year lag in the data for all farm mutuals, the estimate of percentage change is derived from the loss experience of sample farm mutual companies.[54]

GROSS AND NET RENT DUE LANDLORDS

This series represents a computed value of crops, livestock, and cash rents paid for the use of rented lands in the United States. Estimates are also made annually of the expenses paid by landlords. These are deducted from rents paid to obtain net rents. Net rent is then divided between landlords living on farms and those not living on farms. This latter series is treated as a production expense of farm operators and it is also incorporated in the estimates of national income. Basic data for the estimates of gross rents and landlord expenses are derived from the various census reports, from a special survey of landlords made in 1936, and from annual reports of the total value of farm crops, cash receipts from farm marketings,

and cash outlay for various farm operating expenses.

Gross rent payable to landlords.—The gross-rent estimate is made up of four parts: (1) Cash rent paid for farms and separate tracts rented by tenants and part-owners, (2) cash paid for pasture and buildings in addition to a share of the crop, (3) value of crops due as rent from land operated under crop-share leases by tenants, sharecroppers, and part-owners, and (4) value of the landlord's share of the crops and livestock produced on farms rented under livestock-share leasing arrangements. Acres of total rented land, acres of cropland, and acreage rented under various leasing arrangements are taken from census reports. An estimate of the amount of cash rent paid is derived by multiplying the total acreage rented for cash, as reported by the census, by an average cash rent per acre. This rate is adjusted annually to reflect the prevailing cash rents reported by crop reporters on the April General Schedule.

The value of the rent due landlords for land rented for a share of the crop is estimated by distributing the total farm value of crops according to the acreage in cropland that is subject to this lease arrangement, and applying the landlord's fractional share. A weighted-average rental share for all crops was determined from the 1936 special survey of landlords. The amount of rent due landlords for land rented on a livestock-share basis is assumed to be proportional to the total farm acreage operated under this rental arrangement. The average landlord's share is applied to estimated receipts from the sale of crops, livestock, and livestock products produced on such farms.

Estimates of landlord's expenses.—The major expense items entering into this computation are taxes, building repairs, fertilizer, seed, feed, ginning, insurance, and a group of other miscellaneous expenses. The amount paid annually by all farm operators for these expenses is estimated by the Bureau for the purpose of calculating net farm income and other series. The problem of estimating the proportion of these expenses paid by landlords requires the application of various assumptions and ratios established from the 1936 special survey and from census reports.

The estimate of taxes payable on leased land is derived by applying the ratio of the value of leased land to all farm land to the estimate of the total farm real estate taxes payable. The ratio of the value of buildings on leased land to the value of buildings on all land is used as the basis for estimating the proportion of the total cash outlay for building repairs that is borne by landlords. Estimated expenditures for seed, fertilizer, and binder twine on leased

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[54] Methodology used in estimating U. S. farm fire losses is discussed in Botts, Ralph R., and Houseman, Earl E., Method of estimating farm fire losses in the United States. Bur. Agr. Econ., July 1948. [Processed.]

lands are based on the ratio of the crop acreage leased on a share-rent basis to crop acreage of all farms. The ratio of cotton acreage on tenant's farms to total cotton acreage is used as a basis for estimating ginning costs. Allocation of the cost of insurance on rented property is assumed to be proportional to the value of buildings on rented land in relation to the total value of all buildings.

Division of rents between farm and nonfarm landlords.—Estimates of total acreage in farms owned by landlords living on farms and those not living on farms were made on the basis of the 1936 survey. More recent data as to residence of landlords were obtained from a land-ownership survey made in 1945. Net rent and government payments are divided between the two classes of landlords on the basis of the relative proportions of farm land owned by each.

Income to landlords from Government payments.—A portion of the Government payments since 1933 have been paid to the owners of rented property. Although the nature of these payments has varied somewhat from year to year, usually they have been conditional on various practices associated with crop production. It has been assumed, therefore, that the proportion of total Government payments going to rented farms would be the same as the proportion of the total farm value of crops produced on rented land. This amount is then divided between landlord and tenant on the same basis that crops are shared.

Net land returns.—This series provides a measure of the rate of return per acre of farm land which is expressed both as an index number (1935–39 = 100) and as a percentage of the value of farm land. The basic assumption is that the ratio of net land returns to value for all farms is the same as the ratio of net rent to value for leased land in farms. The method of calculating net land returns for a particular year is as follows: (1) The net rent per acre for all land under lease (using the estimate of net rent and acreage under lease described previously) is expressed as a percentage of the value per acre of leased land. The value of leased land for March 1 is related to rents for the preceding year. The annual index of farm real estate values is used in projecting the values reported for Census years. (2) This ratio is applied to the average value per acre of all land in farms (as of March 1), and the resulting amount is designated as the "net land returns" per acre.

COSTS AND RETURNS BY TYPE OF FARM

Returns on commercial family-operated farms are obtained from detailed analyses of year-by-year operations on commercial family-operated farms, by type, in the major producing areas of the United States. Analyses begin with farm operations in 1930 and are kept current by summarizing results of each year's operations.

The procedure followed in collecting, compiling, and analyzing the data for each group of farms is the same. The studies at present are restricted to commercial family-operated farms. This is accomplished by using a combination of income and physical factors on the respective farms. In general, any farm which meets the requirements for type and has a gross value of products between $1,200 and $20,000, based on 1944 prices, is included. As a result, comparisons of returns may be made readily over the years on the same group of farms and also among types of farms.

The type of farm studied is the dominant or more common type in a major producing area. The limits of the areas studied are those outlined in figure 37.

Data for these studies come mainly from the Census of Agriculture, the Production and Marketing Administration, Rural Carrier Surveys, assessor's censuses, Production Credit Associations of the Farm Credit Administration, cost routes of various State farm-management associations, field surveys, and from published statistics on production, prices and related data from the Bureau and from State publications.

Census farm schedules for the years 1930, 1935, 1940, and 1945 for a given area are sorted according to type. This is done on the basis of a combination of value of products and physical factors. Frequency tables are prepared using various combinations of factors. Small-scale and large-scale farms are eliminated from these frequencies leaving only the commercial family-operated farms. Frequency tables of commercial family-operated farms supply the basis for sampling farms in the census, Production Marketing Administration, rural carrier surveys and related sources, and field surveys. The relative number of qualified farms in each cell supplies the weights for compiling various data.

Detailed information is tabulated for a comparatively large sample of farms in each of the respective census years. Similar data are tabulated from Production and Marketing Administration schedules and listings, from assessors' censuses, Production Credit Administration data and related sources. These data supply information as to size of farm, land use, crop production, livestock numbers and production, mechanization, and investment. Rural Carrier data are largely used to estimate year-to-year changes in livestock numbers, land use, and production.

Information as to farm practices, methods of production, feed, seed, fertilizer and labor requirements, farm expenditures, mechanization,
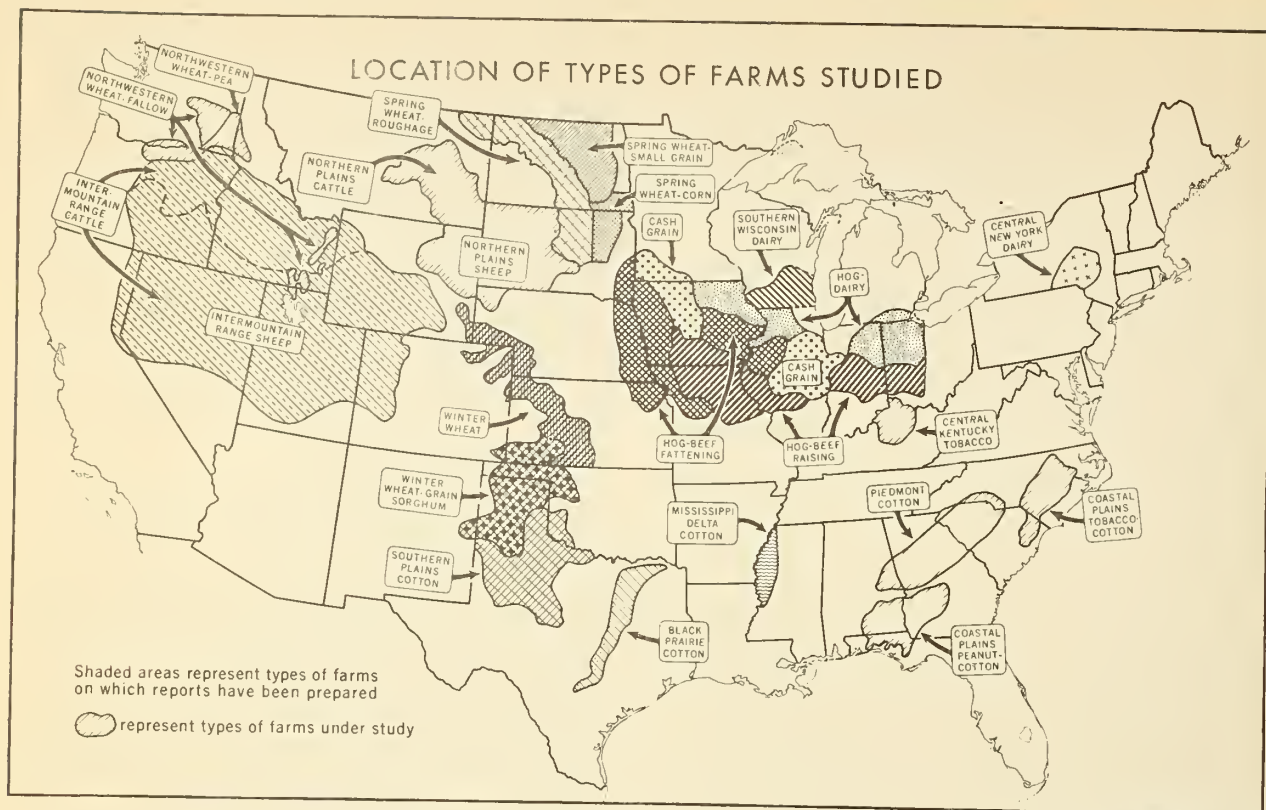
FIGURE 37.—Generalized types of farming in the United States.

cost rates, etc., are obtained from field surveys and also from farm-management cost studies, Production Credit Administration data, and State and Federal publications. A detailed budget and farm-income statement showing both physical and financial information is compiled each year for farms in each type. Several important measures of financial returns are readily available from these analyses and computations. A few important measures of return are:

Operator's net income.—The gross income of operators is computed, for certain types of farms, by adding together income from marketings and government payments, allowances for food and fuel produced and consumed on the farm, a nominal allowance for rental for use of the farm dwelling, and change (plus or minus) in inventory from the beginning to the end of the year. Net farm income of operators (adjusted for changes in inventory) is obtained by subtracting from this gross figure, current expenditures for feeds, seeds, fertilizers, supplies, labor, and other operating expenses including depreciation on machinery, service buildings and related items, and rent and interest paid by the farm operator. The result is

a summary measure of the return to the operator and his family for their labor and management and their investment in the farm. It should be noted that this method of determining the net income of operators for certain types of farms differs in some details from the method of computing realized net income of farm operators for the United States as a whole, described in chapter 20.

Return per hour.—The return per hour to all labor (including the return to farm operators for their management) is obtained by subtracting return to investment from operators' net farm income, then adding to this result the amount paid to hired labor and dividing by the number of hours of labor used on the farm.

The estimated return to total investment is calculated in two steps: (1) Current value of machinery, livestock and feeds and supplies is multiplied by the interest rates on intermediate credit to obtain estimated returns on these farm investments. (2) Average net farm rentals which prevail in the respective area and which could be obtained by the operator as an alternative to operating the farm are used to determine returns to land and buildings.

Net returns per hour to all labor (including

management) used on the farm include allowance for food and fuel consumed by persons working on the farm and a nominal allowance for rental of dwelling. Thus the returns may be compared directly over time on the same farm, among farms of various types, and between farms and competitive types of work.

FARM-RETAIL PRICE SPREADS

The Bureau of Agricultural Economics calculates and publishes estimates of price spreads between farmers and consumers on a continuing basis for foods, cotton products, and tobacco products. Estimates for foods are on a monthly basis, estimates for cotton are quarterly, and the tobacco series are annual.

For each individual food product, an average retail price paid by all purchasing consumers in the United States is estimated. This is based upon large-city retail price quotations of the Bureau of Labor Statistics and retail price quotations of the Bureau of Agricultural Economics for other cities and towns, with supplemental adjustments in some cases. The quantity of physical farm produce equivalent to the retail unit for each item is determined and valued in terms of the price received by farmers. An imputed byproduct allowance is subtracted from this farm value for those products yielding a significant value of byproducts during a processing operation. Subtraction of the finally adjusted farm value (after allowance for imputed by-product valuation) from the retail price provides the farm-to-retail price spread or marketing margin for the product.

Some products, such as sugar and margarine, are taxed during marketing. During the processing tax period of 1933-36 a number of other products were so taxed. These taxes are included in the margin, but are not considered to be components of "marketing charges." They are subtracted from the marketing margin to obtain an estimate of the marketing charge. On the other hand, subsidies paid to marketing agencies cover a portion of the total marketing charge and are a net addition to the marketing margin. Marketing subsidies, such as those paid to marketing agencies during the wartime price-control program, are added to the marketing margins in order to obtain estimates of marketing charges.

Individual food items are combined into related commodity groups and are further combined into a family "market basket" of farm food products through weighting by quantities which represent 1935-39 average annual purchases per family of three average consumers.

The farmer's share of the consumer's dollar spent for each product, commodity group, or the "market basket" of all farm food products, is calculated by expressing the farm value as a percentage of the retail value or price.

Similar estimates of farm-retail price spreads have been developed for a group of 42 cotton products which include clothing, home furnishings, and yard-goods items. For each description of a retail article, farm value has been calculated for the equivalent quantity, grade, and staple length of lint cotton required in its manufacture. Retail prices, farm values of equivalent lint cotton, marketing margins, and marketing charges are combined into aggregates for all cotton products through weighting by quantities representing average purchases per family per year, as reported by the Bureau of Labor Statistics for surveys conducted during 1934-36. Complete series from 1927 to date are available for only a few of the 42 individual items.

Estimates of farm-retail price spreads for four principal tobacco products, cigarettes, cigars, smoking tobacco, and plug chewing tobacco begin with 1927. Appropriate types and quantities of leaf tobacco for each product are valued at the average of prices received by farmers for the second and third seasons preceding the year of pricing at retail, to allow for the time lag for storing, curing, and aging the leaf. The four products are combined through weighting by relative tax-paid withdrawals of leaf for manufacture of each, as reported by the Bureau of Internal Revenue, and adjusting the total to represent the quantity of products obtainable from one pound of leaf tobacco. No allowance is made for use of imported tobacco in these series.

INDEX NUMBERS OF FARM OUTPUT AND GROSS FARM PRODUCTION

Over-all measures of farm output and gross farm production for the United States and geographic divisions have been developed as aids in analyses of changes in farm production and labor productivity. Farm output measures the annual volume of farm production available for eventual human use. Gross production is a measure of the total product of farm land and farm labor resources each year. Gross production includes total crop production, pasture consumed by all livestock, and the product added in the conversion of feed and pasture into livestock and livestock products for human use and into farm-produced power of horses and mules. The quantity-price aggregate of farm output is calculated by subtracting from the quantity-price aggregate of gross production the quantity-price aggregate of farm-produced power (feed and pasture consumed by horses and mules plus the product added in converting this feed and pasture into animal power).

Weighted average values per unit of each

commodity in 1935-39 were used as weights. Separate sets of average values were calculated for use as weights in each geographic division. The quantity data for crops are of total production in the crop year. The quantity data for livestock are of net live-weight production for the calendar year or the quantity of livestock products. The most important item omitted was farm forestry production. Commodities of little importance were omitted in some regions.

Production of crops and production of livestock were combined by the product-added method. This method credits production of feed crops to the geographic division in which the feed was grown and credits livestock "manufacturing" production (product added) to the geographic division in which shipped-in feed was fed. For instance, the farm price of hogs averaged about $8 per cwt. in the 1935-39 period. Enterprise studies show that about three-fourths of the cost of hog production is for feed; therefore, the product added per 100 pounds of hogs is $2 at average 1935-39 prices. In calculating product added by each class of livestock the same factors were used each year.

Annual quantity-price aggregates of farm output and gross production for the United States were obtained by summing the regional data for the period 1919 to date. The two indexes have been extended back to 1910 on a United States basis only.[55]

FARM LABOR REQUIREMENTS

Man-hour requirements per acre of each crop, and per head or per unit of production for each kind of livestock, have been estimated annually for the nine geographic divisions, beginning with 1919, and for the United States beginning with 1910. These rates were applied to estimated crop acreages and estimated numbers of livestock or quantities of livestock products to arrive at total direct man-hour requirements for all farm enterprises.

Farm-cost accounts and other data indicate that the direct man-hour requirements in farming constitute about 85 percent of the requirements for all farm work. The additional 15 percent is for overhead or farm-maintenance work consisting of such jobs as construction and repair of fences and buildings, machinery repair, work on permanent pasture and in farm forestry, construction and upkeep of ditches and structures for irrigation, drainage and erosion control, farm business, and other miscellaneous work.

Man-hour requirements are expressed in terms of man-equivalent hours or the time used by an average adult male worker in performing farm jobs. As many women, children, and older workers accomplish less in an hour than an average adult male, actual hours spent at farm work by all workers in any given year will exceed the total of man-equivalent hours.

The bench-marks for the man-hour requirements per acre, and per head were those published by States for 1939 in "Labor Requirements for Crops and Livestock," [56] and for 1939 and 1944 in "Farm Labor Requirements in the United States, 1939 and 1944." [57] Estimates for years before 1939 were based primarily on reports of the Works Progress Administration National Research Project, chiefly "Changing Technology and Employment in Agriculture." [58] Factors considered in developing the annual changes in labor requirements per acre or per head vary among enterprises. For crops, important factors were yields and changes in farm practices and mechanization. For livestock, size of herds, production per animal (such as eggs per hen), total volume of production, and extent of mechanization (such as use of milking machines) were considered. Labor-requirements data from other sources, chiefly reports of State Experiment Stations, were used in checking hours per acre or per head.

NUMBERS OF FARM MACHINES

The first estimates of numbers of principal farm machines were published in the Bureau of Agricultural Economics report F.M. 41, "Age and Size of Farm Machines," and F.M. 42, "Work Performed with Principal Farm Machines." [59] In these reports, estimates of machine numbers were by State groups and for the United States.

In developing the original estimates of machine numbers, several sources of information were used. In late 1941 county war boards estimated numbers of specified kinds of farm machines in their counties. In February 1942, crop correspondents reported the number of specified machines on their farms on January 1,

[55] A list of products included, price weights, and other details concerning the construction of the indexes are contained in Barton, Glen T., and Cooper, Martin R., F. M. 53, 1945, Farm production in war and peace. United States Bur. Agr. Econ. [Processed.]

[56] Cooper, M. R., Holley, W. C., Hawthorne, H. W., and Washburn, R. S., Labor requirements for crops and livestock. U. S. Bur. Agr. Econ., F. M. 40, 1943. [Processed.]

[57] Hecht, Reuben, Farm labor requirements in the United States 1939 and 1944. U. S. Bur. Agr. Econ., F. M. 59, 1947. [Processed.]

[58] United States Works Progress Administration. National Research Project. [Reports.]

[59] Brodell, A. P., and Birkhead, James W., Age and size of principal farm machines. U. S. Bur. Agr. Econ., F. M. 41, 1943 [processed], and Brodell, A. P., and Birkhead, James W., Work performed with principal farm machines. U. S. Bur. Agr. Econ., F. M. 42, 1943. [Processed.]

1942, as well as age of machine, hours used in 1941, and average amount of work performed in a 10-hour day. The Bureau of the Census shows for most machines, total shipments and exports, and thus the number of machines available for the domestic market.[60] These reports, together with the age-distribution pattern of the machines on crop correspondents' farms, provided the chief basis for estimating the total number of each machine in the United States. County war boards' estimates and crop correspondents' reports provided the chief basis for estimating the number of machines in each State. State estimates were sent to the various State colleges for review before publication.

In a later Bureau of Agricultural Economics report, F.M. 46, "Number and Duty of Principal Farm Machines," estimates of numbers of farm machines are reported for individual States for January 1, 1942, and for January 1, 1945, and for State groups each year from January 1, 1942, to January 1, 1945. State estimates for war years following 1942 were based principally on allocations of specific machines to States and on estimates of loss of machines from wear and obsolescence.

The 1945 Agricultural Census provided for 1945 State estimates of numbers of combines and numbers of farms with milking machines. Previous estimates for these machines were revised in line with the census estimate. Since 1945, yearly estimates of corn pickers, milking machines, windrow pick-up balers, and combines have been developed from data on farm purchases of new machines, and by estimating disappearance of machines because of wear and obsolescence. Findings of the interview survey provide an estimate of numbers of corn pickers and combines and numbers of farms with milking machines on May 1, 1948. These were in close agreement with the previously published estimates for January 1, 1948. The May 1948 interview survey also provided an estimate of numbers of tractor-moldboard plows, grain drills, mowers, manure spreaders, side-delivery rakes, and grain binders. Estimates show about the same percentage distribution by State groups as was shown for 1945 in F.M. 46, Number and Duty of Principal Farm Machines.[61]

NUMBERS OF FARMS CHANGING HANDS BY VARIOUS METHODS

This series presents the number of farms changing hands per 1,000 farms during the last year, by States and geographic regions. These

types of transfers are recognized: (1) Voluntary sales and trades (including contracts but not options), (2) sales due to delinquent taxes, (3) foreclosures of mortgages, bankruptcies, and related defaults, (4) transfers resulting from inheritance and gift, (5) administrator and executor sales, and (6) miscellaneous and unclassified sales.

The basic data for this series are obtained from the March General Schedule. Crop Reporters are requested to list the number of farms that have changed ownership during the preceding 12 months within a relatively small area, which includes their own farm and those that adjoin or corner on their own. In recent years between 16,000 and 17,000 reporters have supplied this information annually. The average sample area is about 6.6 farms per reporter.

State statisticians summarize these reports by crop-reporting districts. A percentage distribution of the various classes of transfers is then calculated for each crop-reporting district and the ratio for each class of transfer is multiplied by the total number of farms in the district, as taken from the 1925 Census. This gives an estimated number of each type of transfer occurring in the district. These district estimates are then combined into estimates for States, geographic divisions, and the United States, using number of farms as weights throughout. Final results are then expressed in terms of the number of farms changing hands by various methods per 1,000 of all farms. The numbers of farms used as weights in the Southern States exclude sharecropper farms. This adjustment is necessary because changes in ownership usually involve entire plantations rather than individual share cropper units.

LIVESTOCK ON FARMS

The Bureau of Agricultural Economics formerly published four series which were called animal units of livestock on farms. These came to be used for two different purposes: (1) an indication of year-to-year changes in inventory numbers of livestock on farms January 1; (2) an indication of potential demand or requirements for feed. In order to meet both types of needs more adequately, the Bureau in 1948 replaced the four old series with six new ones falling into two different categories. To measure inventory changes—that is, changes in the total number of animals on farms January 1— it constructed four new series which it calls index numbers (instead of animal units) of livestock on farms January 1. The weights used in combining the numbers of each class of livestock into index numbers are based on the rela-

[60] United States Bureau of the Census. Facts for industry reports.

[61] Brodell. A. P., and Cooper, M. R., Number and duty of principal farm machines. U. S. Bur. Agr. Econ., F. M. 46, 1944. [Processed.]

tive sales value per head of livestock and poultry (in 1937-41, or in 1941 alone for horses and mules) instead of on the relative amounts of feed consumed by the different classes of livestock. To measure potential feed consumption by all livestock on farms, the Bureau constructed two new series which it calls animal units, but which are based on the number of feed-consuming animal units on farms throughout the year (instead of on January 1). Weights used in combining the individual classes of livestock into the two animal unit series are based on relative feed consumption of the different classes of livestock. The two new series of animal units fed include all livestock and poultry fed in a year rather than only those on hand January 1. These series are computed by States, whereas the former series were computed only for the United States. The feeding year commencing October 1 has been used as the year to which the animal units relate.

Two sets of animal units are computed (1) grain-consuming livestock, and (2) roughage-consuming livestock. Animal units of grain-consuming livestock show the number of all kinds of livestock combined that consume concentrated feeds of all kinds, including grain and byproduct feeds but excluding corn in silage. Animal units of roughage-consuming livestock show the number of all kinds of livestock combined that consume hay, silage, stover, straw, pasture, range forage, and other roughages.

In each case an animal unit is the equivalent in feed consumption of one average milk cow. In 1945-46 for example, there were 75.3 million animal units of roughage-consuming livestock. This means that all of the farm livestock of this country in 1945-46 consumed as much roughage as would be consumed by 75.3 million milk cows, at the constant rate of consumption used in the calculations.

Animal units were computed by multiplying the number of different classes of cattle, sheep, horses, mules, and hens and pullets on farms on January 1 in each State by factors that reflect the feed consumption of these classes for a year. In addition, the number of pigs saved and chickens and turkeys raised are multiplied by factors that represent their feed consumption in a year. Thus, the total for a given kind of livestock or of all livestock gives the animal units fed in a year.

FARM POPULATION

Since the early nineteen twenties, the Bureau of Agricultural Economics has issued annual estimates of the number of persons living on farms at the beginning of each year and of the several types of changes that occurred in the farm population during the preceding year, for the United States and its nine major geographic divisions. In 1944, certain changes in methods of developing the estimates were introduced, and since that time the estimate of the total number of persons living on farms of the United States has been developed jointly by the Bureau of the Census and the Bureau of Agricultural Economics. However, annual estimates of migration to and from farms, and of births and deaths in the farm population of the United States and major divisions, as well as the total farm-population estimates for divisions, are developed and issued by the Bureau of Agricultural Economics.

At the beginning of each year mailed questionnaires on movement of farm population are sent to approximately 55,000 farmers. These request a report on population changes through births, deaths, and migration that occurred in the preceding year on the reporter's own farm and on each farm that touches his own. Between 10 and 15 thousand replies are received. Each contains information as to population changes that took place on 4 or 5 farms in the year just past and on the number of persons living on these farms at the beginning and the end of the year. The questionnaires are returned to the offices of the State agricultural statisticians and are forwarded to Washington for editing and summarization.

The report for each farm is edited for consistency so that the number of persons living on farms at the end of any year is the sum of (1) the number of persons at the beginning of the year *plus* the number of births and (2) the number of persons moving to farms *less* the number of deaths, and (3) the number of persons moving from farms. Results are tabulated by States, but are summarized only for groups of States, because the returns from many States are too few to permit stable estimates. Each type of population change in a year—births, deaths, in-and-out migration—is expressed as a ratio to the population living on the farms at the beginning of the year. These ratios are applied to the estimates previously made of the population living on farms at the beginning of the year to give preliminary estimates of the various types of changes that have occurred during the year. Combining the estimates of change with the previously estimated farm population at the beginning of the year affords a preliminary estimate of the farm population at the beginning of the next year.

These preliminary estimates are subjected to several types of adjustments. The more important of these is adjustment of the migration in a year to the level that will make the estimate of the farm population at the beginning of the next year correspond with the level for the en-

tire United States estimated cooperatively by the Bureau of the Census and the Bureau of Agricultural Economics. Minor adjustments of a smoothing nature are made if irregularities appear in the reported birth or death rates. Adjustments are made to the reported farm-to-farm movement to make the net balance of such movement equal to zero for the United States.

After the adjustments described above, the estimates are released as postcensal estimates of the farm population and its several types of annual changes. When new bench-mark data become available from censuses or enumerative surveys, the estimates are revised. Sources of bench-mark data utilized for the farm population estimates since 1940 include the 1940 Population Census, the 1945 Census of Agriculture, and the January 1947 Bureau of Agricultural Economics Survey of Agriculture.

DOMESTIC FOOD DISAPPEARANCE

The Bureau of Agricultural Economics combines the information on production of major food commodities with information on foreign trade, changes in stocks and amount used by the military and nonfood uses, to obtain estimates of domestic food disappearance or consumption. From these are derived the official estimates of food consumption per capita, in terms of primary distribution weights, which are published regularly in *The National Food Situation*. An over-all index of civilian per capita food consumption in terms of retail weight is prepared in which average retail prices in 1935-39 are used to combine the quantities of major foods consumed per capita in each year. The data relating to supply and distribution of the major foods also form the basis for an index of total food utilization by source and distribution. For this index the major agricultural food commodities are combined in farm-weight terms by means of average farm prices during the years 1935-39. [62]

[62] The sources and methods used in making the estimates of food consumption and the indexes are described in detail in U. S. Dept. Agr. Misc. Pub. *691*, Consumption of Food in the United States, 1909-48.

CHAPTER 22. THE MARKET NEWS SERVICES

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Since its beginning in 1915 the purpose of the Federal Market News Services has been to collect and distribute regularly and promptly accurate and complete marketing information, to aid in the effective distribution and fair pricing of farm products. Because market news is available for free public use, it helps many growers solve their marketing problems. It has put them on a more nearly equal bargaining basis with those with whom they deal. The Florida fruit and vegetable growers, for example, can hear every day over the radio what their commodities sold for on the current morning's market in northern cities. Thus, they have a means of judging approximately what returns they should receive. Market news also helps tradespeople do a more effective marketing job. It helps determine markets to which to ship in order to obtain better distribution and more profitable returns. By thus facilitating the diversion of supplies to the points where they are most needed, market shortages and gluts are prevented. When court action is required to settle disputes that arise out of the marketing of agricultural products, the prices of commodities appearing on a market news report are accepted by courts as evidence of prices prevailing in the market on the day in question. Market news also provides essential information for use in administering marketing agreements, price-support, and other Federal and State programs.

The need for timely market information on farm products grew out of several basic changes affecting American agriculture. After the Civil War, the growth of urban industries resulted in a shift of population to cities. In 1850 only 12.5 percent of the American people lived in cities of more than 8,000 population. By 1870 this percentage had increased to 20.9 and by 1910 to 38.7. [63]

Along with this movement of population to urban centers farming shifted from the largely self-sufficing occupation that it was before the Civil War to production of crops principally for sale. The rapid development of railroads opened up new markets to agriculture and made possible regional specialization in farm production.

With markets farther away from producing areas, marketing of farm products became more complex. More than estimates of crop production were found to be needed in making marketing decisions and establishing prices. Dealers in farm products at an early date developed their own private sources of information, and private market-reporting agencies were established to supply the growing demand for information. These private agencies operated in a limited way, and reports were supplied to subscribers only. This situation placed the producer at a disadvantage in bargaining with buyers better informed than himself regarding actual market conditions. Over the years it gradually became apparent that the only effective way of providing producers and the trade in general with the comprehensive marketing information they needed was through an unbiased public agency.

HISTORY

The establishment of marketing work in the Department of Agriculture was provided for by Congress in the Agricultural Appropriation Act for 1914, which was approved by the President on March 4, 1913. This Act, in pertinent part, reads: "To enable the Secretary of Agriculture to acquire and diffuse among the people of the United States useful information on subjects connected with the marketing and distribution of farm products . . . there is hereby appropriated the sum of $50,000."

On May 16, 1913, the Office of Markets was created by the Secretary of Agriculture. This organization undertook, among other things, "an investigation relating to the practicability, methods, and costs of conducting a general market news service." After a period of study and experimentation, the first United States Department of Agriculture market report was issued on March 27, 1915, at Hammond, La. It reported the movement and prices of strawberries. Later in the season, at a few other points, reports were added on fresh tomatoes, cantaloups, and peaches. In 1915, men engaged in market news work on fruits and vegetables were stationed in six cities—New York, N. Y.; Chicago, Ill.; St. Louis, and Kansas City, Mo.; Buffalo, N. Y.; and Baltimore, Md.—and in

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[63] United States Bureau of the Census The Fifteenth Census of the United States.

seven temporary offices located in producing sections during the harvesting seasons.

One of the first discoveries made in early market news reporting was that dealers were even more interested in arrivals on markets and in shipments out of producing areas than they were in quoted prices. Arrangements, therefore, were entered into with railroads for obtaining information on shipment of fruits and vegetables, and a Weekly Summary of Carlot Shipments was begun in May 1916, based on daily reports received from railroads representing approximately 225,000 miles of railroad out of a total of 260,000 miles of railroad in the United States. This summary showed number of cars arriving, unloaded, or diverted at all principal markets.

In 1916 initial studies were made on reporting marketing information for livestock and meat, dairy and poultry products, and grain, seed, and hay. In June and July of that year, market reports were sent out on oats from a few States in the Southwest. Bi-weekly reports were first issued on August 11, 1917, for wheat, corn, oats, and hay in the States of Virginia, West Virginia, North Carolina, South Carolina, Maryland, and Delaware. These reports showed stocks on hand, prevailing prices, probable receipts, and shipments in that territory. Branch offices for this service were opened in 1918.

The Agricultural Appropriation Act for the fiscal year 1917 authorized the Secretary of Agriculture to gather, compile, and publish market information on livestock, meat, and meat byproducts, and appropriated $65,000 to be used for this purpose. During that year Livestock Market News offices were established in Boston, Mass; New York, N. Y.; Philadelphia, Pa.; Washington, D. C.; Chicago, Ill; Omaha, Nebr.; Kansas City, Mo.; Portland, Oreg.; and Fort Worth, Tex. First reports on the wholesale meat trade were issued on February 19, 1917, from Boston, Mass.; New York, N. Y.; and Philadelphia, Pa.

In 1918 arrangements were made to report trading and prices at the public livestock markets, and the first reports were released from Chicago, Ill. on June 1, 1918. In early 1919 the service was extended to Kansas City and Omaha. The market news service for dairy and poultry products was formally inaugurated in the fall of 1918, although some daily reports had been issued on butter, eggs, and cheese since the fall of 1917. During 1918 dairy and poultry market news reporting offices were located in Washington, D. C.; Boston, Mass.; New York, N. Y.; Philadelphia, Pa.; Chicago, Ill.; Minneapolis, Minn.; and San Francisco, Calif.

The first telegraphic reports between offices

were sent in code over commercial wires, but in 1917, when the United States became involved in World War I, arrangements were made with the American Telephone and Telegraph Company to lease wire circuits for exclusive use 12 hours each day. This service was extended to connect most of the permanent offices. It expedited the service and enabled reporters to include more detailed information in the reports. It also did much to change the attitude of the city trade, because it enabled the Department to issue more price news from other markets than dealers were able to obtain for themselves.

In 1919 market news for cotton started under an amendment to the Cotton Futures Act. Since 1937, the Smith-Doxey Act has provided for the free classing of cotton to members of cotton-improvement groups and for collection and dissemination of cotton market news.

The first wireless broadcast of United States Department of Agriculture's market news formally arranged by market news personnel was made on December 15, 1920, over the radio station of the United States Bureau of Standards. For a time market news went out over this station daily. "Ham" operators who picked up the broadcast were requested to make copies of the report and deliver them to county agricultural agents, farmers' organizations, shippers, and others interested. The first radio market news broadcast by voice went out on February 19, 1921, over the radio station of the University of Minnesota, using the call letters 9XI. As the station had only 5-watt power, it covered a very small area. In May 1920, the same University of Minnesota station, using the same call letters, but operating through radio telegraph, made experimental broadcasts, using market news reports.

The Agricultural Appropriation Act for the fiscal year 1932 authorized market news for tobacco, and in July of that year the service was started on several markets in the flue-cured area on which inspection service was in effect on a voluntary basis. In 1935 the Tobacco Inspection Act was approved, providing for a market news service on any market where two-thirds of the growers voting in a referendum favor compulsory inspection.

ORGANIZATION

From the foregoing summary it can be seen that what is sometimes referred to as "the Market News Service" of the Department has developed as six separate services—Cotton, Dairy and Poultry, Fruit and Vegetable, Grain, Livestock, and Tobacco. These services are administratively located in their respective commodity branches within the Production and

Marketing Administration. The Dairy and Poultry Market News Service is in the Dairy Branch.

Basic policies and procedures are established in Washington, D. C. However, the nature of the market-news reporting job is such that the local reporter must be directly responsible for the accuracy of the reports, for maintaining working relationships with the trade, and for adjusting reporting methods to suit local conditions. Where two or more market-news field offices are housed in the same building, a Market News Service Joint Operating Committee is set up. These committees supervise and conduct cooperatively the duplicating and mailing of market news reports. In Washington, D. C., problems of joint concern are coordinated by the Deputy Assistant Administrator for Marketing of the Production and Marketing Administration, and through a Market News Committee consisting of the Deputy Assistant Administrator for Marketing as chairman, the heads of the six market news services, and one representative each from the Information, Marketing. Research, Fats and Oils, and Sugar branches.

RAIL AND BOAT REPORTS

In order to avoid confusion and duplication of effort all arrangements for securing reports on rail and boat movement of fruits and vegetables, dairy and poultry products, and livestock are made through the Transportation Reports Section of the Fruit and Vegetable Market News Service. When inaugurating arrangements or making drastic changes in existing arrangements, clearance is first made with the higher transportation officials of the railroad involved. When the scope of coverage is country-wide, the Association of American Railroads is asked to clear the project. If they do, it is their custom to write the operating officials of the railroads concerned, recommending that they cooperate. In the case of steamship line reports, officials of each individual steamship line are consulted, and the entire reporting plan is cleared with them. In each case, whether railroad, express company, or steamship line, the employees held actually responsible for preparation of the reports are instructed through their official channels what, when, and how to report. The systems of reporting rail and boat shipments have been developed in a way that will utilize so far as possible the methods used by the companies in keeping their own records.

FEDERAL-STATE COOPERATION

The United States Department of Agriculture and many States have entered into Federal-State agreements which make possible a greatly expanded market news service as compared with that which could have been provided by the Federal Market News Services alone. In 1949, agreements were in effect with 37 States. This cooperation has done much to reduce duplication of effort and to expand market news coverage. It has resulted in greater uniformity of reporting methods, market news terms, and presentation than would otherwise exist if each of the cooperating States and the Federal Government operated its own market news service independently. In those States in which the service is conducted under cooperative agreements, it is referred to as a Federal-State Market News Service and reports issued are thus credited. Because many agricultural products are produced for a distant market and are shipped across State lines, the States benefit from the exchange of information with the Federal service.

DISSEMINATION OF MARKET NEWS

In the dissemination of market news to users, speed is at a premium. Every effort is made to get news out while it is timely.

Leased wire

Market information is transmitted from one market news office to another through the use of leased wire. On an average, approximately 87 market news offices are connected by about 10,000 miles of communications wire leased on an 8-hour-day basis (fig. 38). The leased wire operates through eight circuits, each serving a section of the country. Messages placed on the wire at any one point in the circuit reach all points on that circuit and can be relayed to offices on any other circuit when this is desirable. The leased wire service is supplemented by Teletypewriter Exchange Service (TWX) and Western Union telegraph between seasonal offices and points on the leased wire, and in California through the State-operated short-wave radio. The Tobacco Market News Service uses the telephone for the transmission of market news between its offices.

Each market news office makes use of that part of the news carried on the leased wire that the reporter in charge believes to be of value in his reports. For example, a daily report put out by the Fruit and Vegetable Market News Service in New York City may contain brief statements on market conditions in Philadelphia, Pa.; Chicago, Ill.; Pittsburgh, Pa.; Boston, Mass., or other terminal markets and from a number of shipping points. This is in addition to information concerning market conditions in New York City. The market information is released to the public through mailed

FIGURE 38.—Market News offices and leased wire system, 1949.

mimeographed reports, newspapers, radios, bulletin boards, personal contact, telephone, and telegraph.

Cooperation with press and radio services

Arrangements are in effect with the Associated Press, United Press, International News Service, and Transradio Press whereby they distribute market news information over their facilities to newspapers and radio stations in all parts of the country. These services pick up market news reports from many of the market news offices for transmission to local and distant points. Special consolidated market news reports are prepared for their use by the five area offices of the Information Branch, Production and Marketing Administration, in Atlanta, Ga.; Chicago, Ill.; Dallas, Tex.; New York, N. Y.; and San Francisco, Calif. These consolidated reports cover all major commodities for each market in areas in which there is a Federal or Federal-State Market News Service. They are prepared for midmorning, afternoon, and overnight transmission. The Information Branch is responsible for relations with press, radio, and other information outlets for the Production and Marketing Administration, both in Washington and in the field.

Radio

Nearly 1,100 radio stations throughout the United States in 1949 regularly broadcast market news information. Probably many persons who listen to these broadcasts do not know that the information they receive in this way was collected by either the Federal or Federal-State Market News Services. In nearly all instances, radio market news reports are adapted to the specific needs of the listening audience. A city station may broadcast a report of local wholesale prices, or, if adjacent to a producing area, prices that are received by shippers for nearby products. A station serving a producing area may report on local prices, prices paid in city

markets, and shipments currently moving from the area. These radio reports are sometimes written by a market news reporter or an employee of an area office of the Information Branch. Usually, however, the reports are written by employees of the radio station on the basis of information furnished by the Market News Service through one of the commercial news services.

Telegraph

Whenever there is sufficient demand for a CND (Commercial News Dispatch) report on a product in a given market, the Western Union Telegraph Co. will transmit such market information on a subscription basis. When requested to do so by Western Union, any market news office will furnish information on which to base such a report. Information by wire is also supplied by market news offices to out-of-town users on a collect basis.

Mailed reports

Each of the market news services puts out market news reports which are mailed upon request. These reports are issued at different time intervals—daily, weekly, monthly, semi-annually, and annually—depending on the type of information and the needs of users. More than 25 million copies of these reports are distributed annually. While these reports are not disseminated as speedily as those broadcast over the radio, they provide a more complete and detailed report that can be studied at leisure and filed away as an authoritative record. See Appendix G for examples.

Newspapers

It is estimated that in 1949 approximately 1,100 daily newspapers out of the 1,887 daily papers published in the United States carried market news information collected by the Department. Also, approximately 2,000 weekly and farm papers frequently carry market news reviews and special articles of local interest based on market news reports. Information on which these newspaper reports are based comes either directly from the market news offices or from them via the Associated Press, United Press, and International News Services. In a number of cities the market news reporter prepares special reports for the local newspapers on commodities which are of special interest. Reports carried by newspapers are seldom as complete as are the official mimeographed reports, but they have an advantage in that newspapers sometimes are delivered earlier than are mailed reports in some sections.

Bulletin boards

Market news releases of local interest are posted on bulletin boards that are accessible to farmers and tradespeople. These bulletin boards are located in stockyards, cotton gins, shipping sheds, tobacco warehouses, post offices, country stores, or banks.

Telephone

So far as possible, market news offices answer telephone requests for market information. Occasionally, market news offices are requested to supply information by telephone to out-of-town firms or individuals. This they will do on a collect basis.

COTTON MARKET NEWS [64]

Cotton Market News provides cotton farmers, ginners, merchants, processors, and other members of the cotton industry with information on prices, stocks, quality, and market activity for lint cotton, cotton linters, cottonseed and its byproducts, and for some types of cotton cloth. Special emphasis is placed on assisting farmers to obtain prices for their cotton based on its quality as a part of the "Smith-Doxey" quality improvement program for cotton. The service is administered from Washington by the Cotton Branch, and it is operated through area offices located in Atlanta, Ga.; Bakersfield, Calif.; Dallas, Tex.; and Memphis, Tenn. The information collected by the four area offices is supplemented by data supplied from 29 additional classing offices, and, during the active harvesting season, by information collected from smaller marketing centers.

Reporting price information

Prices are reported on lint cotton, cotton linters, and cottonseed. ("Lint cotton" refers to the cotton fibers separated from the seeds in ginning. "Cotton linters" refers to the short fibers that cling to the seeds after ginning, but which are separated from the seeds at the cottonseed-oil mills.) In collecting these prices and other market information, a cotton market news reporter must meet with the various members of the trade. These include individual operators buying a few bales, as well as representatives of large firms who operate throughout the entire Cotton Belt. The reporter must have sufficient ability and a suitable personality to command their confidence so that they will reveal to him a large part of their individual operations, and tell him the prices at which they are selling or buying cotton. He must know enough about each person from whom he col-

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[64] For a listing of Cotton Market News reports, see Appendix G.

lects information to determine whether the information provided is biased by the market position of the operator furnishing it; in other words, whether the person is selling or buying. It is not unusual for market reporters to be furnished biased information. Reporters must detect such bias and either eliminate the information or make allowance for the bias in using such data. A cotton market news reporter must not only be able to obtain authentic information; he must be familiar with cotton classing. This is necessary because he must occasionally examine samples that have been bought or sold for various prices and determine whether the grades and staple lengths are in line with Government standards or whether he should make some adjustments in the prices due to the fact that the quality, as represented, is not in line with that of the official standards.

Ten spot market prices.—Daily price quotations, with premiums or discounts, are reported for the various qualities of cotton in each of 10 markets designated by the Secretary of Agriculture, under the "Cotton Futures Act" as "bona fide" spot markets.[65]

The spot markets designated by the Secretary are located at Augusta, Ga.; Charleston, S. C.; Dallas, Tex.; Galveston, Tex.; Houston, Tex.; Little Rock, Ark.; Memphis, Tenn.; Montgomery, Ala.; New Orleans, La.; and Savannah, Ga. Prices in these markets are quoted by committees of buyers and sellers under the supervision of the Production and Marketing Administration of the United States Department of Agriculture, in accordance with the regulations of the Cotton Futures Act. These quotations committees of three to five members meet in the afternoon of each marketing day and report any changes in value of the various qualities of upland cotton traded on the market during the last 24 hours. About 300 different qualities of upland cotton are reported, and prices are quoted as premiums and discounts on or off the price of the base quality, Middling 15/16 inch staple. The actual price of the base quality in each market and the number of bales reported as sold in the market during the day are also reported. All prices and differentials are quoted in cents and points (1/100 of a cent) per pound.

Daily quotations are widely used as a basis for settling futures contracts and for making and settling other contracts, granting credits, etc. These quotations are wired to the office of the Cotton Branch at Memphis, Tenn., which issues a daily quotation sheet. This release also includes data as to volume of sales and base price in each of the 10 markets.

Cotton prices at other markets and areas than the 10 spot markets are regularly collected by employees of the Cotton Branch through personal interviews with buyers and sellers at the following markets: Abilene, Tex.; Alexandria, La.; Altus, Okla.; Bakersfield, Calif.; Corpus Christi, Tex.; El Paso, Tex.; Fresno, Calif.; Greenwood, Miss.; Hayti, Mo.; Lubbock, Tex.; Oklahoma City, Okla.; Phoenix, Ariz.; and Tulare, Calif. Interviews are conducted with farmers, ginners, and others to determine the prices they are receiving and paying for cotton, and with local buyers to determine the prices they are paying. The data are compiled and edited, and quotations are averaged by grades and staple lengths. In addition, prices paid farmers at other local markets are sometimes reported to representatives of the Department.

Cotton prices delivered or landed at mill points are obtained by market news representatives from mills, merchants, and shippers through the use of mail schedule, personal contact, and by telephone. They are designed to provide quick and reliable average prices for the various staple lengths, grades, and growths of cotton most in demand by mills, as well as the spread between spot prices and landed mill prices in the various sections of the Cotton Belt and the New England States. Those sections for which landed mill prices are reported include: The southeastern mills—principally in Georgia, Alabama, and Eastern Tennessee; Group B mills—principally in South Carolina and the southern half of North Carolina; Group A mills—principally in the northern half of North Carolina; and the New England mills— in the New England States. The prices as quoted are for even-running lots, prompt shipment, delivered, landing costs and brokerage included.

Prices for cotton linters are obtained by representatives of the market news service in the three principal linters market areas, namely, Atlanta, Ga., Memphis, Tenn., and Dallas, Tex., and from other sources. In each of the three markets, a committee consisting of buyers and sellers of linters meets each week and furnishes the price quotations. The market news representative checks these quotations by obtaining supplemental information from other sources. These prices are for uncompressed linters in carload lots, f.o.b. cottonseed-oil mill points, excluding mills at ports. He also obtains market-activity information and other linters news within the area and wires his findings to the Washington office.

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[65] Under the act ". . . the Secretary of Agriculture is directed to consider only markets in which spot cotton is sold in such volume and under such conditions as customarily to reflect accurately the value of Middling cotton and the differences between the prices or values of Middling cotton and of other grades of cotton . . ." A spot cotton transaction is one in which ownership of the physical product is transferred from seller to buyer at time of sale.

Prices paid by ginners to farmers for cotton-seed are collected from cotton gins by mail and by field representatives on a weekly basis by counties throughout most of the cotton-producing belt during the active marketing season. Prices are quoted per ton of cottonseed received by farmers in wagonlot quantities.

Reporting cotton and cottonseed quality

Quality of cotton ginned is reported during the ginning season in terms of its grade and staple length by States, districts, and ginning periods. This information is obtained by classing approximately 10 percent of all ginnings, except in the far West, where from 90 to 100 percent of all ginnings are classed under the Smith-Doxey Act. Representative gins are selected in the different districts, these gins send samples from each bale they gin to the Department of Agriculture's classing offices. From these samples, the percentage of cotton of each class (grade and staple length combination) is estimated. To determine the number of bales ginned of each quality, percentages for the various qualities are applied to the total number of bales ginned as reported by the Bureau of the Census. In those areas in which more than 90 percent of the ginnings are classed, all samples classed are tabulated and adjusted to total ginnings to obtain the quality report.

The quality of cotton in the carry-over from previous years' crops is estimated as of August 1, and released as soon afterwards as possible, usually in September. The estimate is made by classing samples representative of cotton in storage in mills, public compresses, and warehouses. From these samples the percentage of cotton of each staple length and grade is determined for upland cotton and American Egyptian cotton, and for the staple length of cotton of foreign growth. The quantity of each quality is computed by applying the sample to total stocks in each mill and warehouse for privately owned cotton as reported by the Bureau of the Census. To arrive at *total* carry-over figures, quantities of Government stocks by grades and staple lengths are obtained from the Commodity Credit Corporation and added to the privately owned stocks.

Data showing the quality of cotton linters are collected from nearly all of the cottonseed-oil mills during the crushing season (usually late September through July) by field men of the Cotton Branch who obtain samples and send them to Washington for grading.

The grades of cottonseed as determined by chemical analysis are obtained from cottonseed analysis certificates issued during the season in nearly all of the cotton-producing States by licensed chemists. These chemists are licensed and supervised by the Cotton Branch, and are required to send copies of the certificates they issue to the various area offices of the Cotton Branch.

Preparation of reports

The market news reports on cotton, in reviewing and summarizing the cotton situation, make use of all pertinent reliable information dealing with such factors as production, stocks, consumption, prices, imports, exports, and quality. In addition to the information collected on prices and quality, they make use of data on the quantities ginned, carry-over, exports, and imports as compiled by the Department of Commerce; production estimates and mid-month farm and parity prices of the Bureau of Agricultural Economics; and information on prices of cotton cloth from trade publications and other sources.

Except for the cotton price quotations for the 10 spot markets, which are released daily from Memphis, Tenn., the cotton market news reports and the various quality reports are issued weekly, semimonthly, monthly, or annually. General information on both domestic and world supply and demand conditions is assembled, analyzed, and summarized in Washington. It is released in the form of weekly cotton market reviews from Washington and from each of the four area offices. These weekly reviews also carry price, quality, movement, and other information relative to the cotton market situation. Summaries of prices are prepared and released each month giving comparisons between markets and with prices of former months and years. These releases also contain brief analyses and interpretations of happenings during the month that may have influenced the market.

During the ginning season, reports are prepared showing estimated amounts of various qualities of cotton ginned during the current ginning period and during the season to date. These reports are published on the same dates that the Bureau of the Census reports on volume of ginnings. The release dates vary slightly from season to season, but the reports are usually issued twice each month during August, September, October, November, and December and once in January. A report on quality of the entire crop is issued around March 20 of each year. Reports summarizing quality for the United States are issued from Washington, and reports for individual States are released from the four area offices. A report is issued once a year on the quality of cotton in the carry-over (stock on hand August 1). A final quality report covering the crop and carry-over with comparative data entitled "Cotton Quality Statistics" is released later in the year.

A review of the cotton linters marketing sit-

uation is prepared each week. It carries information on prices, production, consumption, and stocks of linters along with related information. It is based on reports from the Cotton Branch field offices located in the important linters markets. Following the end of the cottonseed crushing season, usually in August, estimates are prepared combining the quality information collected by the Cotton Branch with the census data on production to show the quantities of the various grades produced. The higher grades, principally "First Cuts," are linters suitable for making mattresses, upholstery, felts, low-grade yarns, etc. The medium grades, principally "Mill Run" linters, are used by both the chemical and felting industries. The lower grades, principally "Second Cuts," are used for chemical purposes in the manufacture of rayon, smokeless powder, celluloid, etc.

Copies of the cottonseed analysis certificates sent in to the area offices by licensed chemists are summarized weekly by counties to show the low, high, and average grades, and are published in a weekly review along with prices paid farmers per ton in these same counties. These data are supplemented by a written analysis prepared from a national standpoint on prices and market information on cottonseed and its byproducts and with similar information for other oilseed products which is wired from Washington. This is the only report of this nature published; it attracts very wide circulation and interest throughout the Cotton Belt. It is used by farmers, ginners, and cottonseed-oil mills and tends to result in returns to farmers that are commensurate with the oil and protein content of their cottonseed.

Special reports are prepared each week to guide the farmers in selling their cotton. The current premiums and discounts paid in the spot markets are shown for the various grades and staple lengths the farmers have for sale. The price differences for the various qualities published in these reports may be applied to the futures prices published in local papers and broadcast over radio stations several times daily during the cotton-marketing season. The price information obtained by farmers through these reports also permits them to make comparison with loan values and thus determine whether to place their cotton in the loan program or sell it. The basic Government loan rates at selected points are shown, plus premiums and discounts for selected qualities.

The spreads between the price per pound of raw cotton and its approximate cloth equivalent are computed each month for 17 standard constructions of cloth, including printcloths, sheetings, twills, drills, sateen, and ducks. The prices of the fabrics quoted in trade publica-

tions and from other sources are converted to prices for the approximate quantity of cloth obtainable from a pound of cotton with adjustments for sizing and salable waste. The average price in the 10 spot markets of the quality of cotton assumed to be used in each cloth construction is used for computing the margin.

DAIRY AND POULTRY MARKET NEWS [66]

Dairy and Poultry Market News issues reports on prices, market conditions, market receipts, dealers' stocks, cold-storage holdings, retail movements, and other marketing information on a wide variety of products. These include:

Dairy products.—Butter, cheese, fluid milk, sweet cream, dry whole milk, nonfat dry milk solids, dried whey, condensed milk, evaporated milk, and casein.

Poultry products.—Shell eggs, frozen eggs, dried eggs, live poultry, dressed poultry, live turkeys, and dressed turkeys.

To collect this information 28 field offices are located throughout the United States. The products covered by each office and the kinds of market information reported depend upon: (a) The level of trading in the market that permits the best market coverage and hence provides the best reflection of current conditions; (b) availability of market information; and (c) the kind of information experience that has proved to be of greatest value to the industry. For example, in the Cleveland, Ohio, market there is no wholesale trading in live poultry such as is reported in New York, Philadelphia, or Baltimore, but it is possible to get a good coverage of f.o.b. market prices, that is, what the first receiver pays for poultry delivered in Cleveland. On the other hand, on this same market it is impracticable to report either f.o.b. market prices or wholesale prices of Government-graded eggs because for the most part the first change in ownership of such eggs reaching the Cleveland market is between the shippers or shippers' representatives and the retail distributors—this is a jobbing transaction and is so reported. Another example is the Madison, Wis., Market News office which reports f.o.b. selling prices of cheese and nonfat dry milk solids at Wisconsin assembly points. These prices are reported for both car or truckload lots and l.c.l. (less than carload lots). They represent prices received by assemblers for products loaded for shipment. These reports, although they cover only the State of Wisconsin, have a bearing on prices throughout

[66] For a listing of Dairy and Poultry Market News reports, see Appendix G.

the country because of the importance of Wisconsin as a cheese-producing State.

Reporting Prices and Market Information

Market reporters obtain prices and other market information by visiting those engaged in buying and selling dairy and poultry products during the normal time of trading or immediately thereafter. However, because the information must be collected in a limited time, it is sometimes necessary to use the telephone in contacting those buyers and sellers who are widely scattered throughout the market area. In all instances it is essential that friendly and cordial relationships be maintained. The information is provided voluntarily, and for this reason a reporter must have a suitable personality and sufficient integrity and technical knowledge to warrant the trade's cooperation and trust. Several kinds of prices are reported:

Wholesale selling prices are those for sales which, according to local custom, constitute wholesale business. These wholesale transactions usually refer to sales to buyers of large quantities for cash or short-time credit. The size of the wholesale transactions varies between markets and between commodities. In a given market, for example, the usual wholesale transaction may be 25 boxes or more of butter at 68 pounds per box; 10 cases of eggs or more at 30 dozen per case; or one coop or more of live poultry at 50 to 60 pounds of poultry per coop. Wholesale selling prices as reported by Market News include not only the open-market sales where the selling prices are agreed upon at the time of sale, but also those sales where the product was previously contracted for at a fixed price differential from some recognized published commercial quotation used as a base.

Jobbing prices are for sales in small lots sold to retail food outlets, stores, restaurants, etc. They include certain additional costs incurred in the market such as repackaging, providing special brands, small-lot deliveries, credit, etc. For these reasons, jobbing prices are higher and often show wider ranges than do the wholesale prices.

F.o.b. (free on board) market buying prices are the prices paid by first receivers to producers, haulers, and hucksters for products bought on a delivered market basis. Usually the sale involves deliveries to the receiver's establishment by truck. These quotations are to be distinguished from the wholesale prices, in that while the f.o.b. market prices are prices paid by receivers, wholesale prices are prices for which the receivers sell. The differences include costs of wholesaling and profit.

F.o.b. farm prices are those received by producers at the farm.

Selling prices f.o.b. primary markets or country assembly points are those received by assemblers for products loaded for shipment.

All classes and grades of the products being traded in the market are for the most part reported, insofar as available personnel permits. Prices of commercially grown chickens, for example, are usually reported by class (fryers, broilers, fowl, etc.), weight, and grade. Considerable skill is required on the part of the reporter in sifting and analyzing the information to insure that the reports are accurate and comparable from day to day and week to week, which they must be to be of value.

When there is more than one price on the market for a product of a given kind, grade, weight, condition, etc., a price range is reported followed by a "mostly" price when it can be determined. It is normal to find price variations in nearly all market trading and buyers have individual preferences that result in price differences. For example, butter buyers frequently have individual preferences for a particular character, shade of color, salt content, packaging, uniformity, and other factors all of which may be found within the same grade of butter.

The accuracy of price information obtained from trade members is constantly checked by gathering sales data from buyers as well as sellers, and maintaining broad coverage of the market. The reporter also is on constant guard against attempts by the trade to influence the prices reported by over- or under-rating the quality of product sold or by withholding pertinent details. No market price, however, is discarded that represents a bona fide transaction. When a dealer is known to have bought or sold for more or less than was previously reported for the market, these price changes are recognized; but if the prices are found to be out-of-line with other sales in the market, the transaction is verified as to the quality of product, condition of sale, etc. Should the product be found to be of questionable grade, the lot sold unreasonably small, or the packaging unsound, etc., the price is not used.

At times the wholesale selling prices reported by the Dairy and Poultry Market News Service may be found to differ from those published by the commercial reporting agencies. This frequently results from receivers and shippers using commercial quotations as a basis for settlement. The shippers in such instances are guaranteed payment at the "market price" as quoted by a commercial reporting agency or sometimes a premium over it. But when the receivers make payments equal to or higher than a commercial market quotation, it follows that their *actual* selling prices at the wholesale trading level must be somewhat higher unless they are to operate at a loss. It is the *actual*

wholesale selling prices that Market News reports.

Competition for goods sometimes results in shippers receiving f.o.b. prices at the markets which are higher than any published wholesale selling prices. Such a situation can result if the particular goods in question are sold directly to jobbers or retail distributors rather than to wholesale distributors.

Reporting Supplies and Movement

Supplies of dairy and poultry products marketed and available for market are indicated by production estimates of the Bureau of Agricultural Economics, and by data gathered by Market News representatives on receipts, shipments, dealers' stocks, and cold-storage holdings. References to market supply as used in market news reports, refer to the composite quantities in current receipts, dealers' floor stocks, and cold-storage warehouse stocks. The combination of these data for a given period, as compared with another, show relative changes in the local supply situation. These changes are expressed in such terms as relatively heavier or lighter, larger or smaller, increased, decreased, etc. Changes in market receipts together with changes in market supply indicate the rate of local sales. Changes in size of dealers' floor stocks provide some indication of the tendency for products to move freely or to accumulate.

Receipts at country assembly points are collected weekly via reports mailed by cooperating concerns to the Chicago, Ill.; Washington, D. C.; and Pacific Coast market news offices. These cooperators include approximately 230 plants in the West Central States, 60 plants in the Pacific Coast States (eggs only), and 35 eastern egg auction and producers' assembling plants (eggs only). Information as to volume of sales of live poultry off farms is collected in the principal broiler-producing areas. Releases of the above data are made each week for the previous calendar week showing numbers of plants reporting and total receipts.

Receipts at city markets include rail, motortruck, boat, and parcel-post arrivals. Rail and boat arrivals are reported daily by the railroads and boat lines. They include actual unloads or deliveries within defined areas of individual cities regardless of the nature of the billing. Shipments billed with a designated market as final destination, with or without storage-in-transit privileges, are included in receipts if actually unloaded. The receipts (including both freight and express) are made up by rail carriers from waybills, and the information reported includes quantities, shown by States in which shipments originated. For shipments using storage-in-transit privilege, the railroads reporting at ultimate destination give the original State of origin. In the case of new shipments, or reshipments, the railroads report the State of origin from which the new or reshipments were made. Truck receipts at city markets are obtained by States of origin from wholesalers, jobbers, chain-store warehouses, cold-storage warehouses, and independent distributors by mail. Except for some locally produced products which may go direct to consumers, stores, or restaurants, most motortruck shipments go to wholesale receivers or others in the above-mentioned group. Because of the difficulty in getting information regarding motortruck receipts, such data are not as complete as those for rail receipts, which are obtained direct from public carriers. Parcelpost receipts of eggs at city markets are reported by local post office officials.

Cold-storage stocks are obtained by telephone or telegraph from cold-storage warehouse operators except in a few instances in which they are obtained by mail. The latter applies only when figures are required only once a week and the distance is relatively short. Daily movement in and out of cold storage, and cold-storage stocks are compiled for New York, Chicago, Philadelphia, Boston, San Francisco, Providence, Buffalo, Pittsburgh, St. Louis, Kansas City, and Omaha. Figures are released separately for the five cities first named, and as a six-market total for the remaining cities.

Cold-storage stocks on hand as of Saturday morning are released from Washington, D. C., each Monday for a group of 35 cities, including those listed above. As these cities carry approximately three-fourths of the total dairy and poultry products in all storages in the country, they afford a basis for making estimates of total United States stocks considerably in advance of the monthly reports. (For a description of monthly cold-storage reports, see chapter 23.) All storage stocks are reported in terms of net pounds, except eggs, which are in terms of cases of 30 dozen per case. Goods held in bond, if any, are included in storage reports.

The quantities of butter and eggs on dealers' floors (dealers' floor stocks) are compiled from forms mailed in regularly by a selected group of wholesalers, jobbers, and chain-store companies in the respective markets. These groups include the larger receivers and distributors located in different areas of the market. It has been found impracticable in actual operation to obtain current floor stocks from every dealer.

Retail movements of butter and eggs are compiled weekly at Chicago, and San Francisco; and for eggs at Los Angeles. Reports are obtained on the movement into retail stores from such representative groups as chain-store or-

ganizations, milk distributors, and wholesale butter and egg distributors. Because the city-wide retail-store inventory holdings of butter and eggs are normally quite constant, these reports reflect the movement out of retail stores and into the hands of consumers. The weekly reports give the total pounds of butter and eggs distributed by those reporting, and in Chicago, subtotals are shown for reports from chain stores, milk distributors, and wholesale distributors, including number of stores and milk routes, and averages per store and route.

Preparation of reports

In preparing his reports the reporter draws upon all information available to him concerning actual and prospective supplies, rate of movement into consumption, trade sentiment, and consumer demand. In fact, any current development having an influence on commodity values is considered. Market prices are viewed as the end result of market conditions existing at time of sale, and the market comments are designed to inform readers of existing market forces primarily because of their prospective influence on sales yet to be made. No actual predictions are made.

Brief statements dealing with pertinent happenings which influence the commodity markets are carried in the published market reports. These include information on Government programs, such as announcements about price-support and procurement intentions, quantities purchased, and prices paid; announcements of foreign buying and export trade; production estimates released by the Bureau of Agricultural Economics; etc.

The weekly and monthly reports usually include reviews of market developments. Their purpose is to give a brief analysis of price trends and contributing factors. They are designed to meet the needs of those interested in general trends, but whose activities do not require following the more frequent reports. One effective way of evaluating market conditions is in comparison with previous periods and for this reason nearly all of the dairy and poultry market reports carry comparative market figures. To indicate production, the weekly butter and cheese production reports compiled by the Bureau of Agricultural Economics are carried in the Market News reports and also the weekly butter production report compiled by the American Butter Institute of Chicago, which covers creameries of the centralizer type and is not confined to any particular geographic area.

The averages used in Dairy and Poultry Market News reports are simple averages unless otherwise indicated, that is, they are not weighted according to volume or season. Thus, the average price of a given grade of butter during a given month is the sum of the daily prices divided by the number of days for which prices were published. When 5-year average comparisons are shown, these cover the preceding 5 years.

FRUIT AND VEGETABLE MARKET NEWS [67]

Fruit and Vegetable Market News issues reports on market conditions, prices, and movement for nearly all commercially grown fresh fruits and vegetables. It covers primarily two classes of markets—the large city wholesale markets and the more important of the producing and shipping areas. Year-round offices are maintained in 22 of the large city markets, and 35 offices are operated in the shipping areas during the active harvesting and marketing seasons, which range from 3 to 4 weeks up to 6 or 8 months. Weekly reports are issued on peanuts and a semimonthly report on honey.

Reporting Prices and Market Information

In a city market, the fruit and vegetable market reporter spends several hours each day during the period of active trading—usually the early morning hours—on "Produce Row." He talks to sellers and buyers to obtain the latest information on demand, the volume and quality of offerings, market trends, and detailed prices on commodities being sold. So far as possible, information is obtained by personal interview. The telephone is used in city offices to collect information from dealers not located near the established market areas or to check back for additional information. All elements of the trade, both buyers and sellers, are contacted.

In a shipping area the market reporter keeps in contact throughout the day and evening with shippers, loaders, buyers, growers, and others. He obtains a complete picture on volume of loadings, quality, demand, market trend, price, and other conditions which may affect the market. The telephone is used extensively in shipping areas in contacting operators located at some distance from the office or in outlying towns or areas. Telegrams are used in unusual cases to obtain information from distant sources.

All markets are covered as completely as possible. The large numbers of commodities reported and individuals who must be interviewed make it necessary for reporters to obtain information speedily and to maintain the simplest records. No forms for general use by market reporters have been developed. Each reporter develops his own system of note tak-

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[67] For a listing of Fruit and Vegetable reports, see Appendix G.

ing and record keeping. Occasionally, sales tickets, manifests, or other records are checked by reporters to verify questionable prices, but for the most part the accuracy of prices quoted to reporters is established by cross-checking between the various buyers and sellers. The majority of produce operators realize that correct reports are the only valuable ones and cooperate with the reporters to provide honest information. Because of frequent and unpredictable variations in market dealings, it has never been found feasible to arrive at a true over-all picture by sampling a portion of the trade.

In order to make the information of value to those engaged in marketing, considerable detail is given concerning the fruits and vegetables on which prices are quoted. Individual prices are reported on commodities by States of origin, kind of container, variety or varietal types, grade, size, quality, and condition. In a city market of moderate size, apple quotations may be made on fruit from a half-dozen States, in as many as 3 or 4 different containers, with possibly 5 to 10 varieties from each State, and each variety broken down into several grades and sizes.

Prices are normally quoted as a price range, and insofar as possible the price range is based on sales of produce of good merchantable quality and condition. Briefly, this means average good quality. Offerings of exceptional quality, which may sell for higher prices, or of inferior quality, which may sell for lower prices, are covered by outside quotations qualified by appropriate descriptive terms. A typical market report might read: "APPLES MKT. DULL. U. S. #1, MICHIGAN bu. baskets, 2-inch minimum, $2.75-3.00 (Average good quality and condition being understood), few fine quality 3.15-3.25, fair quality and condition 2.35-2.50, ordinary condition showing considerable decay as low as 1.75." By closely defining the product reported, an attempt is made to keep the price ranges as narrow as possible. On some markets, trading practices are such that relatively narrow price ranges are usual. In other markets, usually the larger and more active, price variations are, as a rule, wider. In using market news reports for claim or statistical purposes, it has become rather general practice to use the midpoint between the high and low of the average good quality product as being the closest available approximation to the average price, although it is, of course, understood that this midpoint is not necessarily the true average.

Prices quoted in the larger city markets generally are those for sales at wholesale. Broadly defined, these represent sales by the original receiver in lots of 5 to 10 up to 100 or more

packages to jobbers or large retailers who can buy in wholesale quantities. Sales by original receivers to small retailers are made at higher prices and are not regarded as wholesale quotations. In a few markets and on specific commodities, sales may be made by original receivers in carlots. For example, in Chicago a large proportion of the potatoes and onions are sold as carlots. These sales are designated in market reports as "carlot sales." In cities of around a quarter of a million population or less, there are, as a rule, only a limited number of original receivers who sell in wholesale quantities to jobbers. In cities of this class, receivers mostly act in the capacity of jobbers or service wholesalers who sell direct to retailers. In these cities, prices reported are "sales to retailers." Special sales in large quantities to jobbers may be specifically designated as "sales to jobbers" or "wholesale lots." In a few cities in which brokers' activities are sufficiently heavy to be of broad significance to dealers in shipping areas or in other markets, "brokers' sales" are quoted. These may be further qualified as "brokers' sales delivered to market" or "brokers' sales to outside points."

In shipping areas, there are a large number of different bases for sales. In most sections, quotations are on a f.o.b. (free on board) basis. In other words, they are on the basis of carlots or trucklots packed and loaded by the shipper at packing-house door or other assembly point. F.o.b. sales fall into different categories, depending mainly upon where possession of the product is taken and the rights of the buyer and seller after the sale is made. In sales "f.o.b. cash track," the buyer usually pays cash at shipping point and takes full possession of the car with little or no recourse against the shipper. Sales "f.o.b. usual terms" call for payment by the receiver at point of destination with right of inspection at destination, but with no recourse against the shipper except for failure to deliver at the shipping point goods that meet the terms of the contract. Sales "f.o.b. acceptance final" give the buyer no recourse against the shipper. A few commodities, notably onions and potatoes, are sold on a delivered basis. In other words, acceptance and payment are made at point of destination with the shipper assuming full responsibility for delivering a product that meets the requirements of the sales contract. In market news reports, these sales are designated as "delivered sales, shipping point basis." Transportation costs are subtracted from the delivered prices received in the different city markets in order to reduce them to the equivalent of shipping-point prices. Sometimes sales are made on different bases than those just described. When this occurs in sufficient volume to affect the market, prices

are quoted with special reference to the particular basis on which the sales are made.

In 10 of the larger Eastern and North Central cities a large proportion of the citrus fruits, Western deciduous fruits, and a few other commodities are sold at auction. In most of these cities, commercial auction-reporting firms report the auction prices and averages, and the Market News Service uses their figures. In a few shipping areas, commodities are also sold at auction. At these points, the auction averages may be computed by the auction company or, in a few cases, they may be calculated by the market news representative. In general, auction averages are weighted on the basis of number of packages contained in each individual car or other unit of sale. Prices usually are shown on auction reports as high and low prices and the weighted average for the entire volume of a particular item sold.

Rail and boat shipments

Each railroad in the United States reports daily to the Transportation Report Section of the Fruit and Vegetable Market News Service the number of cars of fruits and vegetables shipped, by commodity and State of origin. This report is based on a 12 o'clock midnight cut-off, and the information is wired to Washington in time for preparation of a daily shipment release at 9 a.m. e.s.t. Methods followed by the railroads in making reports vary with their individual systems for maintaining carlot records, and to some extent with the communication system they use. For most railroads the reports are channeled through offices of division superintendents or through the office of some other major operating department. In all instances, the daily report is transmitted to Washington, D. C., by rapid Western Union wire, "Government Collect." The railroads report separately the shipments of Government surplus purchases and movement to processors. Where no separation is made, it is assumed that all shipments are moving in so-called "commercial channels." Railroads report shipments moving on initial line-haul waybills only. This prevents more than one railroad reporting the same carload.

In addition to the daily reports on fruit and vegetable shipments, monthly reports are furnished by the railroads. These reports are compared with the daily reports, and when differences beyond allowed tolerances exist, discrepancy sheets are prepared and returned to the railroads, requesting adjustments which will result in the same quantities of each commodity reported by days and by stations for the month. When these discrepancies are corrected, it sometimes results in previously unreported cars being added to the figures carried in the market news reports.

Arrangements are also in effect with boat lines to report shipments of fresh fruits and vegetables produced in the United States which were trucked to the boat line. They do not report shipments delivered to them by railroads because this would duplicate reports already made by the railroads. Imports by commodities and country of origin are reported by rail and boat lines. These are reported as of the date the carlots or the cargoes are cleared by the Bureau of Customs at ports of entry.

Daily information on specific commodities is furnished to certain seasonal field offices by railroads and boat lines. This information includes either all or part of the following: Primary destinations of the commodities from States being covered, diversions from specific diversion points, passing reports from specific rail classification yards, and shipments of certain commodities from a specific area segregated by more detailed districts than are carried in the regular daily shipment release. These data are carried in the releases of the seasonal offices.

Rail and boat unloads.—In 27 cities in the United States, railroads, express companies, and boat lines make daily reports to the local market news office on arrivals, diversion, and number of cars unloaded. All these reports are by commodities and by States or countries of origin. In addition, the railroads and express companies report daily the number of cars of each commodity held on track as of 7:00 a.m. Fruit and Vegetable Market News offices carry this arrival and on-track information, and in some cases the daily unloads, in their daily mimeographed report. In 16 of these cities, data on arrivals and cars on track for important commodities are wired to Washington, D. C., and combined into the "16-cities" track report. The 16-cities track report and the daily shipment release form two barometers which growers, shippers, and distributors of fruits and vegetables follow closely to determine volume of supplies and movement in connection with their daily marketing of these commodities. In addition to the reports obtained by market news offices in 27 cities reports are obtained direct from railroads in 73 cities giving the number of cars that arrived and the number of cars diverted for 21 principal commodities by State of origin. Arrangements are also in effect with the Canadian Department of Agriculture to supply information or rail unloads for five principal Canadian cities.

Truck shipments

Shipments of fresh fruits and vegetables moving by motortruck are reported to only

a very limited extent. The following truck information is collected on a somewhat delayed basis and is given limited dissemination: Truckloads of citrus fruits moving out of Florida and Texas as reported under compulsory inspection; movement of truckloads of vegetables out of Florida as reported at road-guard stations near the State border; truckloads of Arizona and California citrus fruits, Georgia peaches, and Maine potatoes as compiled under their respective marketing agreement programs. All of these truck data are published in the annual shipment summaries that give rail information. Some additional truck data, also, are carried in these summaries based on information obtained from the United States Department of Agriculture inspection service and from farmers' markets. Movement of farm products by motortruck is rapidly increasing, and there is a definite need for information comparable to that obtained on rail and boat movement. Some experimental reporting is now done to determine problems, feasible methods, and costs of obtaining more complete truck movement reports.

Truck receipts (or unloads).—Data on daily truck receipts of wholesale quantities are obtained for 13 cities by local market news offices. These reports are obtained by telephone or personal contact direct from receivers on the wholesale market, chain stores, and market managers. Completeness of truck data varies with the individual markets. It is estimated that coverage ranges from slightly more than half to nearly complete, depending on local conditions.

Preparation of reports

All fruit and vegetable market information is published by the Market News Service in daily reports or is issued as preliminary releases for press and radio use. Because of the great number of commodities covered by the Fruit and Vegetable Market News Service, it is generally impracticable for daily newspapers or radio stations to carry the complete report. For this reason, the daily report issued from each office forms the basis of all fruit and vegetable market news work and is the only complete record.

Daily reports published by the city market news offices include complete detail on local selling prices, either on wholesale basis or on the basis of sales to retailers; data on local carlot arrivals and track holdings; truck receipts in a few markets; the complete report of carlot shipments as compiled by the Transportation Reports Section; f.o.b. reports, as relayed over the leased wire, on commodities of special interest on the local market; and, in

some cases, a limited amount of information from other terminal markets. Daily reports issued from the shipping-point offices are usually limited to either a single or small number of commodities of current interest in that producing area. These reports show shipments for the commodities reported; in some cases, reports on original destinations, or passings and diversion reports; f.o.b. prices for the local shipping area, and from competing shipping areas as reported over the leased wire; reports from the major city markets showing rail receipts and track holdings, truck receipts if reported, market trend, and prices. Special information on crop conditions and production, special reports on weather damage, or other information affecting the marketing of a commodity, as reported by the Bureau of Agricultural Economics or other official agencies, may be carried from time to time on both terminal-market and shipping-point reports.

From the daily reports submitted by railroads and boat lines, a weekly summary of fruit and vegetable shipments is prepared each Monday, comparing shipments for the last week with those for the previous week and those for the corresponding week of the preceding year. In addition, total shipments to date for the current season's crop are compared with the total to the same date for the previous season, as well as with the final totals for the previous season. When all discrepancies have been adjusted, a final carlot shipment summary is compiled showing calendar-year shipments by commodities, States of origin, and months. Imports are shown separately under each commodity. Additional summaries are prepared for each State, showing shipments by commodities, months, counties, and waybilling stations. The county and station information is also compiled into a condensed summary to show shipments by States, counties, stations, and commodities for the Nation as a whole. This summary is published in either June or July of each year and indicates in a condensed form the number of cars by commodities shipped from each station and/or each county during the year.

Monthly summaries showing unloads by commodities and States of origin are prepared in the city market news offices. These monthly summaries show monthly and cumulative totals to date for the current calendar year compared with those for one or two previous years. At the end of the year, an annual summary is prepared for each of these markets outlining the unloads by commodities, States of origin, and months for the entire year. In Washington, D. C., unload data from 27 city market news offices are summarized and combined with unload reports from 73 additional cities to provide

monthly data on unloads of 21 commodities in 100 cities. These data are released through the shipping-point market news offices on the commodities covered by the offices. An annual summary of unloads in 100 cities in the United States and 5 cities in Canada is also compiled, giving unloads for the calendar year. This report is usually released in April.

Each city market news office releases a weekly United States Department of Agriculture food bulletin for use by women's page or food editors, radio commentators, and others who need current background information on the fruit and vegetable situation. In most cities this report is released on Wednesday afternoon for use in week-end food articles to be published in newspapers or broadcasts over the radio. It is prepared so that it can be used in the form in which issued, if a newspaper or radio station does not care to rewrite it. However, at the same time, it contains background information which can be used as a basis for more detailed food write-ups or comments. These food bulletins stress those commodities which are in abundant supply and may need some promotion, and when feasible, they tie in with "abundant food programs" of the Production and Marketing Administration. In season, attention is focused on availability of supplies for home canning. Appearance of new or first-of-the-season commodities, or the approach of the end of the season for an important item, is reported. A few offices maintain regular radio broadcasts prepared and voiced by a market reporter for the special interest of consumers.

Each shipping-point office, at the close or shortly after the close of each shipping season, issues a seasonal summary of marketing operations. This gives in condensed but detailed form, a complete review of marketing conditions, movement, prices, and other factors of the marketing season in the area covered.

The Washington, D. C., office issues weekly and annual summaries showing average prices of fruits and vegetables on the New York and Chicago wholesale markets and in major shipping areas. The Los Angeles and San Francisco offices issue annual summaries showing average wholesale prices on those markets.

<div align="center">GRAIN MARKET NEWS [68]</div>

Grain Market News helps producers of grain, hay, feed, and related commodities to make marketing decisions. It also helps livestock feeders, dairymen, and poultrymen to locate the most advantageous sources of feed. To do this job, Grain Market News brings together

[68] For a listing of Grain Market News reports, see Appendix G.

available information concerning current prices and market conditions. It digests and analyzes this material and includes in its reports those findings which are pertinent.

Crop production estimates of the Bureau of Agricultural Economics; movement of grain in foreign trade as reported by the Department of Commerce; and statistics available from established trade sources, such as grain exchanges, are used in preparing the market news reports. The bulk of the information, however, is obtained from original sources by field men or market correspondents. Field offices are located at Minneapolis, Minn.; Chicago, Ill.; Kansas City, Mo.; Portland, Ore.; and San Francisco and Los Angeles, Calif. The market information collected by these 6 field offices is supplemented by that supplied by 24 commercial correspondents located at important marketing centers.

Reporting Market Prices

Market prices are obtained from several sources and are of various types. Grain futures prices (the selling prices of contracts for future grain deliveries) are obtained from the official records of the grain contract markets. Quotations most frequently used are the closing prices for the three nearest delivery months on wheat at Minneapolis, Chicago, and Kansas City; on corn at Chicago and Kansas City; on oats at Chicago and Minneapolis; and on rye and flaxseed at Minneapolis.

Daily closing cash price records are obtained covering the principal classes and grades of grain at Chicago, St. Louis, Kansas City, Baltimore, Fort Worth, Omaha, Minneapolis, and Portland. In the larger markets they are the prices determined by a grain price committee to most nearly represent the value of cash grain when the market closed. Cash sales, and relation of cash prices to futures during the late marketing period, are considered in establishing this price. In markets where there are no grain exchange closing price committees, the Market News representative, or a commercial correspondent, reports sales made nearest to the market close. In the absence of actual cash sales, nominal quotations are calculated on the basis of active future quotations and the premiums and discounts most recently prevailing between cash and futures prices in that particular market. In West Coast grain markets, where the grain is not offered in the open market, traders use bids and offers to establish market values. There is usually a sufficient spread between the bid and offer prices, however, so that few sales are made. Data on the prices thus established are used as a basis for the actual trading which later takes place in

the offices of the dealers. At Portland, prices established by actual sales are reported by dealers and are made available to the Market News Service the following morning.

Prices of feedstuffs are obtained by market news men or commercial correspondents directly from sales departments of milling firms and oilseed crushers, brokers, dealers, and mixed feed manufacturers. Representative and authentic cash prices for feedstuffs are more difficult to obtain than those for grain, as most of the trading is done in the offices of the feed manufacturer or of wholesale jobbers and brokers. It is necessary for a market news representative to interview these handlers to obtain prices. He must then study the quotations obtained to determine within reasonable limits which are most representative of the day's trading. Occasionally when there is little trading, the quotation arrived at represents only the prices at which feed is available for sale or purchase.

Prices of hay are compiled for market news purposes at both f.o.b. country shipping points and delivered to terminals, such as Kansas City or Los Angeles. The shipping point prices are obtained by direct interviews, by telephone conversations, or by mail from growers and shippers. Terminal-market prices are obtained by direct interviews with dealers on the market. When the hay is not officially graded, the reporter collecting the price information also examines it to determine the quality as a basis for the quotation.

Prices of rice are obtained mostly from millers and dealers. Rough rice is sold by growers or growers' organizations mostly to millers and on the basis of samples. Because no definite grades are assigned, the prices are usually reported as being of either top or average quality for the variety. When no designation is made, quotations for rough rice are usually for average quality. Varieties are an important price-determining factor in rice. Market differentials by variety become fairly well established early in the season. Milled rice sales that are quoted are those made by the millers to wholesalers or jobbers. Although the rice is frequently not officially graded and is usually sold by sample, the Federal grade terms are widely used by the trade to designate quality. The prices and grades quoted to the market news reporters by the different trade members are compared in order to establish representative market quotations. These are not as exact as are quotations on grain sold on public exchanges, but when collected by an experienced person they are as accurate as the methods of trading permit.

Prices on beans and hops are obtained from growers and dealers at country shipping points.

At present, market news on beans is collected only in California by the Federal-State Market News Service. Prices reported are those paid to growers and dealers, quotations f.o.b. shiping point. Prices paid growers are obtained from dealers, shippers, and processors by market news personnel. Shipping-point prices are also obtained from these same sources. Prices of hops are generally obtained from buyers who purchase directly from growers. Such buyers may represent large distributors or brewers. Prices quoted by the Market News Service are those paid to the grower; they include delivery to the buyer's warehouse or into cars at the grower's or country dealer's shipping point.

Reporting Supply and Movement to Market

For grain and other nonperishable commodities, statistics on production, utilization, and stocks in storage are generally more significant than are current market receipts. Commodity production statistics on milled rice, alfalfa meal, and brewers' and distillers' dried grains are collected each month from producers by the Grain Market News Service. Monthly production figures of oilseed meals and grain byproduct feeds are obtained from the Bureau of the Census. Weekly production of wheat millfeed and monthly output of gluten feed and meal are calculated by Market News Service personnel from trade figures of flour production and wet-process corn grindings. Estimates of grain crops are obtained from the Bureau of Agricultural Economics.

Statistics on market stocks on several commodities are obtained from original sources by the Grain Market News Service. Stocks of corn, wheat, oats, rye, barley, flaxseed, and soybeans are obtained at the close of each week at 40 markets which have organized grain exchanges or trade associations. These stocks consist of grain in public or private warehouses, which are considered by the industry to be in commercial channels. Monthly statistics are compiled on stocks of alfalfa meal at producing mills, stocks of brewers' dried grains at breweries, distillers' dried grains at distilleries, and stocks of rough and milled rice at rice mills. Stocks of durum wheat are obtained semiannually from mills.

Statistics on market receipts are not generally available for commodities covered by the Grain Market News Service. Each organized grain market maintains records of receipts of grain arriving at that market. The Chicago Board of Trade compiles daily statistics on receipts of wheat, corn, oats, rye, and soybeans at 12 primary markets. These figures are used as a measure of current marketings, but they are too indefinite and incomplete for a satis-

factory statistical measure of the total quantity of grain moving to market. The only satisfactory measure of the movement of grain to market would be a complete record of the grain moving from farm and country shipping points by motortruck, rail, or water to terminal markets and to milling and processing plants. No practicable way has yet been found to obtain these statistics.

Adequate receipts of shipment figures are not available on feedstuffs. Figures on carlot shipments of certain feeds are available at some of the more important producing markets, but because of intermarket movement and other factors such data are not adequate for market news work. No comprehensive statistics are available as to market movement of rice, beans, or hops. Statistics are obtained from rice mills as to the quantity of rough rice received by mills each month, but no statistics are available on receipts of beans at processing plants or terminal markets. Statistics on movement of hops are fragmentary, and market receipts of hay are collected only at Kansas City and Los Angeles, which are the only two active hay markets. Considerable quantities of hay are moved direct by truck from producing areas to consuming areas, but no estimates are available of the amount moved at any particular time or season.

Preparation of reports

Reports issued by the Grain Market News Service vary with the commodity, methods of marketing peculiar to the commodity, and the need of the groups to be served. Some daily reports are issued but the principal vehicle is the weekly review or summary. These reviews are intended to keep farmers and feeders currently informed as to market conditions and the factors influencing supply and demand. In preparing these reviews, market news specialists must carefully review the price changes that have occurred during the week, any important shifts in market movement and stocks, any changes in crop conditions, and any other factors which have a bearing on the market. All of these factors must be weighed and analyzed so that not only market changes may be reported, but the principal factors which tend to bring about these changes need to be stated so that the farmer or feeder can have intelligent understanding of week-to-week conditions.

Both price indexes and feeding ratios are computed periodically and published in the market reports. A wholesale feed price index and a feed grain price index are calculated each week to provide a guide to changes in prices of feed and grain. These indexes are particularly helpful in determining the trend of feed costs. The feed price index is constructed from the average prices of the principal grain by-product feeds, oilseed meals, and animal-protein feeds at the leading centers of production or distribution. These are weighted by the average annual domestic consumption of the various feeds. The grain price index is constructed in the same way as the feed price index. Hog-corn and cattle-corn ratios are calculated and issued periodically. The ratio of butterfat prices to costs of dairy rations and the ratio of egg prices to costs of poultry ration are computed each month when the mid-month Agricultural Price Report is released by the Bureau of Agricultural Economics. The composition of dairy and poultry rations are based on information furnished for important dairy- and poultry-producing regions by extension specialists in those regions.

Weekly reviews on a number of the commodities are supplemented by special market summaries. These include quarterly summaries for flaxseed, soybeans, rye, oats, barley, grain sorghums, and feed. A semi-annual summary is prepared on the supply and utilization of durum wheat. This report is released from the Minneapolis field office. Annual statistical summaries are prepared on supply and distribution of rice and are released from Washington, D. C., and from San Francisco.

LIVESTOCK MARKET NEWS [69]

The Livestock Market News Service collects information on movement, supplies, demand, prices and price trends of livestock, meat, and wool. Reports are released from the principal livestock markets during trading hours, at the close of the day's trading, and weekly in summary form. The Livestock Market News reporting offices are located at 28 of the principal livestock markets. Information on direct marketing is collected in two areas—at Des Moines, Iowa, and at Thomasville, Ga. Wholesale meat prices and related information are reported at New York, Chicago, Los Angeles, San Francisco, and in the Portland-Tacoma-Seattle area through the Portland office. The wool market is reported at Boston. Seasonal information distributed includes reports on grass cattle issued daily during the late summer and fall seasons and on sheep and lamb contracts issued weekly during the late winter, spring, and summer.

Reporting Prices and Market Information

Reporters obtain information through personal interviews and by keeping in continuous

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[69] For a listing of Livestock Market News reports, see appendix G.

touch with buyers, sellers, producers, traders, and others on the market while trading is in progress. It is only by seeing the livestock at time of sale and by having first-hand knowledge of conditions under which trading is conducted that reporters can adjust for the various opinions expressed by trade members representing different segments of the industry. The livestock market reporter literally lives with the trade and in the stockyards. He has as many changes of yard clothes and shoes or boots as there are major changes in the weather. In some sections of the country that means from 30 degrees below zero to 110 degrees above, cold days and hot days, wet days and dusty days, days when reporters wade in snow knee-deep, or in the muck and mire of the stockyard alleys as the winter's accumulation of manure, hay, and straw is thawing out and breaking up.

As it is physically impossible in most markets for a reporter to obtain information on all individual sales of either livestock or meat, considerable judgment is required to select a representative sample of sales from which to report the price range covering each grade and weight group. Honest differences of opinion exist among trade members regarding the market situation, which must be taken into account by the market news reporter. For example, when changes in trade activity and prices are relatively small there is a general tendency for buyers to consider the price trend to be "steady to higher" and salesmen to consider it to be "steady to lower." Diplomacy is required to obtain the needed information while trading is in progress, and skilled judgment is required to relate accurately the sale price of a specific lot to the price of a comparable lot sold on that or some previous day.

Accuracy in grading and in estimating weights and probable dressing yields of live animals is essential in market news reporting. Individual lots of livestock are sold on personal inspection. They are not graded and labeled before sale, and a guarantee of grade or yield after dressing is seldom included as a part of the sale transaction; yet it is the carcass price (live animal price divided by percentage dress out) that the buyers have constantly in mind. In order to publish market reports that are comparable between markets while they are still timely, price comparisons are made and price trends determined after consideration of *estimated* yields and carcass grades. Because one to several days sometimes elapse following the sale of live animals before the carcasses are graded and weighed, it would greatly reduce the value of market information to report the market in terms of actual carcass prices even if it were feasible to do so.

Livestock market reporters, to maintain accuracy and uniformity in the application of grade standards, must frequently check their judgment on grade and estimated dress out for live animals with the grades and weights of the dressed carcasses. To measure their judgment, statistical correlations are run between the grades the market reporter assigns to the live animals and the carcass grades of the dressed animals as determined by USDA graders. Specific lots of livestock are graded alive, not only as to what grade they fall into, but as to whether they are in the upper, middle, or lower third of the grade. The identity of the lot is maintained through the slaughtering process, and the official grades, by thirds, of the carcasses are obtained for comparison.

Wholesale meat quotations are obtained from those who are selling to the retail trade. They may be jobbers, independent wholesalers, or packer branch houses. Prices are quoted by grade and reflect only sales to retail outlets. In most markets, part of the beef, veal, and lamb supply is officially graded and stamped before it is offered for sale, and sale prices of the ungraded part of the supply are related by the market reporter to the grade to which the product is eligible. Some price variations result because of the differences in the yield of retail cuts obtained from carcasses within the same grade. No estimates of the actual supply are released, but in the reports reference is made to the current supply in relation to the apparent demand. Increasing interest has been displayed in recent years in information on movement and prices of dressed meats. Producers and marketing agencies realize more than ever before the close relation between livestock prices and dressed meat prices.

Most of the commercial wool trade in the United States is conducted by firms which have either headquarters or financial connections in Boston, and all market news reports on wool and mohair are issued from that city. The market reporter interviews wool dealers, representatives of cooperative marketing associations, and wool buyers for mills and topmakers. After obtaining information on transactions completed during the week and reviewing cables from the principal wool markets of the world, he prepares a weekly summary report covering both the domestic and foreign wool trade. Imports of wool and other animal fibers at Boston, New York, and Philadelphia are tabulated by grade and country of origin. These data showing weight and clean content are published weekly.

Reporting supply and movement information

Daily estimates of receipts of "salable" cattle, calves, hogs, and sheep are reported by

all market news offices. A combined figure is issued from Chicago giving estimated "Salable Receipts at Twelve Major Markets." These markets include: Chicago, Cincinnati, Denver, Fort Worth, Indianapolis, Kansas City, Oklahoma City, Omaha, St. Louis National Stock Yards, Sioux City, South St. Joseph, Mo., and South St. Paul, Minn. The totals for these 12 markets for the day are transmitted by wire to all of the Livestock Market News offices early each morning together with those for the same day a week before, and cumulative totals for the week to date with comparisons. These are posted on bulletin boards along with estimates for the individual markets, and are used in market reports at all offices.

In the early days of the Livestock Market News Service, most of the livestock moving in interstate commerce came through the public stockyards and the greater part of it arrived by rail. At that time the only receipt information available was the estimate of the total receipts for the day, and this estimate proved to be a very good indication of the daily supply of livestock available for slaughter. Since that time, there has been an increased movement of livestock to market by truck, accompanied by a tremendous expansion in sales by producers direct to packers. This has been particularly true of hogs, and it has come with the expansion of packing plants and buying stations in areas of concentrated hog production. The percentage of total movement of livestock direct to packers, which is unloaded at the public market and included in the total receipts varies widely between markets and from day to day.

To provide a comparable basis for reporting available market supplies, the Market News Service in 1939 began estimating "salable" receipts separately from total receipts. These "salable" receipts include that portion of receipts which is to be offered for sale. It includes both livestock consigned for sale and that delivered to a dealer, whether owned by him or received on consignment, which is to be placed on sale on the market. Total receipts refer to all animals unloaded at the market for whatever purpose. Only figures on "salable" receipts are released in the early morning estimates.

At several of the larger midwestern markets, advance estimates of the following day's expected marketings are prepared. These advance estimates are based on marketings during the corresponding day of recent weeks, current demand and price trends, weather and road conditions, and similar factors. Actual receipts may vary considerably from the advance estimate. This does not necessarily mean that the estimate was in error. Rather, it often indicates that many producers apparently changed their marketing plans after receiving the advance estimate, usually released around the noon hour. These advance estimates help to promote a more equitable distribution of livestock between markets and reduce price fluctuations by bringing about closer balance between supply and demand.

As an aid in preparing early morning and advance estimates, reports have been furnished by various railroads as to their carloadings of livestock expected for the day's market. Because of the greatly increased movement of livestock by truck in recent years, some arrangements with the rail lines for livestock carloading reports have been discontinued. At present such arrangements are in effect with all rail lines hauling livestock into Chicago, South St. Paul, Omaha, South St. Joseph, and Kansas City, to furnish a report to Livestock Market News offices before 6:00 o'clock each morning showing the number of carloads of livestock segregated as between species expected on the market between 3:00 p.m. of the previous day and 3:00 p.m. of the day of the report. This report is further segregated as between cars for sale in the stockyards, cars billed direct to packers in or near the stockyards, and cars billed through to other destinations, but stopped for feed, water, and rest. From these reports the market news offices estimate the various quantities of the various species of livestock expected to be sold in their respective stockyards.

In direct-marketing areas such as the one in Iowa and southern Minnesota covered by the Des Moines office, and the Georgia-Florida-Alabama area reported by the Thomasville, Ga., office, information is obtained from packing plants and buying stations as to their daily expected receipts and actual marketings for the previous day. Receipts at 14 packing plants and 30 concentration yards are included in the direct marketings reported by the Des Moines office.

Estimates of movements of spring lambs from important producing areas of the West and Southwest, and information as to prices at which lambs or sheep are contracted for future delivery are obtained by personal contact with producers, buyers, and others in those areas, and from industry and transportation representatives. This information is released in the sheep and lamb contract report, prepared weekly or as often as necessary during the late winter, spring, and summer months.

At three markets—Chicago, Omaha, and Sioux City—price, weight, and number of head of steers sold out of first hands for slaughter are tabulated from individual sales records. The grade of each lot is determined by relating

the recorded selling price to the price quotations by class, grade, and weight selection reported for the day on which the sale was made. From these figures, average prices and weights by grades are calculated each day. The daily information is summarized and released from each office at the end of the week. On an annual basis, this information is now compiled on about 1,500,000 beef steers.

At five markets the number, weight, price, and State destination of stocker and feeder cattle shipped to the country are tabulated weekly from records of sales and released. These markets are Chicago, South St. Paul, Kansas City, Omaha, and Sioux City. The weekly stocker and feeder reports show the number, average weight, and average price of stocker and feeder steers by weight groups. The number of stocker and feeder heifers, cows, and calves is also shown. Such information is now compiled on approximately 700,000 head annually. Compilation of these data on stockers and feeders and on beef steers out of first hands is carried on in cooperation with the Bureau of Agricultural Economics.

At eight markets data are obtained daily from packers and order buyers as to number, total weight, and total cost of hogs purchased by them, segregated as to barrows and gilts in one group and sows in another. These markets include: Chicago, St. Louis National Stock Yards, Ill., Kansas City, Omaha, Sioux City, South St. Joseph, South St. Paul, and Indianapolis. The daily average costs and weights of barrows and gilts, and of sows are computed separately at each market. The Washington, D. C. office computes a combined seven-market weekly average cost and weight segregated as between barrows and gilts and sows for the first seven of the above markets. These compilations include about 12,500,000 hogs annually. All of the daily and weekly average prices and weights are used as a check on the accuracy of price quotations and weight distributions previously released in the daily reports.

Preparation of Summary Reports

Summary reviews are prepared and published weekly by most livestock, meats, and wool offices. These releases include comments as to the week's receipts or supplies, the demand, the price trend, actual prices paid by class, grade, and weight, and other pertinent information. A weekly publication "Livestock Market News" is prepared at Washington. This includes a summary of the previous week's livestock, meat, and wool trade and considerable detailed information as to numbers, weights, and prices of livestock, meats, and wool marketed. Pertinent information prepared by other agencies of

the United States Department of Agriculture is included in this publication. A monthly report is also prepared at Washington showing total receipts and disposition of livestock at 66 public stockyards including monthly salable receipts by classes with comparisons with the corresponding month of the previous year.

Throughout the year pertinent data are compiled and tabulated in the Washington, D. C. office, and released in a number of annual reports. These reports include data as to receipts, shipments, and prices of livestock, meat, and wool, number of livestock on farms, Federal slaughter, cold-storage holdings, live and dressed weights, retail prices of meat, exports and imports, production and consumption of meat, production of wool, wool exports and imports, and mill consumption of wool.

TOBACCO MARKET NEWS [70]

The Tobacco Market News Service furnishes reliable and unbiased data on current market prices, volume of sales, and other pertinent information to tobacco growers, the tobacco trade, and other interested persons. The work is authorized under the Tobacco Inspection Act of 1935, which provides for free and mandatory inspection and market news on any market where a grower referendum by a favorable two-thirds majority, indicates a desire for such services.

All of the 155 established auction centers or markets operating in the United States in the 1948-49 season, which handled approximately 90 percent of the total United States production, had inspection and market news services. These auction centers or markets are located in towns or cities where one or more warehouses sell tobacco at auction. Wilson, N. C.; Danville, Va.; and Lexington, Ky., are examples of such auction markets. During the marketing season, inspectors are assigned to these tobacco markets to grade all lots of tobacco before they are sold. When farmers know the quality of their product, they have a basis for accepting or rejecting the bids made on their lots. Market information is furnished to farmers so that they may know what others are receiving on like kinds of tobacco grown in the same climate and soil area and cured in like way. Such tobacco is known as a "tobacco type." Market news is supplied for 14 tobacco types in 12 States.

Interest in tobacco prices and marketing information is generally only area wide, and within the different tobacco-growing areas is usually limited to a few types. However, Government agencies and purchasing companies

[70] For a listing of Tobacco Market News reports, see Appendix G.

that buy extensively require information from all areas on all types of tobacco. Two permanent district offices and 11 seasonal offices are maintained to collect, compile, and disseminate market news for tobacco. The permanent district offices are at Raleigh, N. C. and Louisville, Ky. Seasonal offices are at Valdosta, Waycross, and Statesboro, Ga.; Florence, S. C.; Wilson and Whiteville, N. C.; Danville, Va.; Baltimore, Md.; Lexington, Ky.; Greenville, Tenn.; and Weston, Mo. Permanent employees are shifted from one office to another, and temporary or seasonal employees are also hired during the active marketing season.

Collection of information

Market news information on tobacco is obtained from four principal sources: (1) Actual records of transactions or sales coupons for each lot of tobacco sold on auction floors, (2) comments on the marketing of tobacco provided by Department of Agriculture inspectors, (3) interviews with members of the tobacco trade and direct market observations by Tobacco Market News representatives, and (4) reports from the County Agricultural Conservation Association offices.[71] Each Tobacco Market News report covers a geographic area in which a particular type of tobacco is grown and marketed. Each area includes a number of markets, and several, which are representative of the tobacco type, are selected as a sample. Information on volume and price, by grade, is collected from each sample market on every lot of tobacco sold in a specified portion of each day's sales. For example, data may be gathered from 4 of the 12 markets composing one type and on all lots sold during 3 of the 5 hours of the daily selling time. From the inspector's reports, daily market observations are obtained on all markets in the area, and additional data are furnished by representatives of County Agricultural Conservation Associations as to total volume of sales and general average price. All of these data are reported by telephone, telegraph, mail, and personal contact to the market news office established for the designated area.

Preparation of reports

The need for market information on tobacco seems to be best served through the release of

[71] County Agricultural Conservation Associations are local organizations of farmers who elect from among their members local committeemen for the purpose of cooperating with the Secretary of Agriculture in carrying out certain provisions of the Conservation and Domestic Allotment Act, the Agricultural Adjustment Act of 1938, the Federal Crop Insurance Act, the Sugar Act of 1948, and such other Acts of Congress as the Secretary of Agriculture may designate.

mimeographed reports on prices and market interpretations mailed direct to interested parties, and published in local newspapers. The following reports are prepared for each tobacco type: (1) *The daily price report* includes average auction prices for each grade sold during the day, the average price for total sales, loan rates, and volume of daily sales. It is furnished to all auction markets serving a type and is primarily intended for the use of growers when they sell tobacco. (2) *The daily press and radio release* gives a brief narrative summary of the day's market. It is issued to press agencies and to radio stations. (3) *The weekly market news report* is a detailed summary of the week's marketing activities. It includes an analysis and comparison of price trends, demand, volume of sales, nature of offerings, average prices for total sales, loan rates, and a fairly complete list of weekly and season-to-date average prices by grade. This report is distributed by mail to interested parties. (4) *The season market news report* is similar to the weekly report, but is based on the entire season's marketing activities. (5) *The weekly and season press and radio releases* are practically the same as the corresponding market news reports, except that they are condensed and revised for press and radio purposes.

These reports are all prepared in the district and seasonal offices in order to speed the release of information. Requirements for handling the work vary from type to type because of differences in characteristics of the tobacco itself, marketing practices, and descriptive terminology, but there is a basic procedure for compiling and issuing reports. Average prices for each grade are calculated and set up in tabular form from the data on individual trading lots. These average daily prices are then compared and studied. Volume and general average prices for total sales which are received from the county Agricultural Conservation Association representatives on all markets, are checked and tabulated. Inspectors' reports and reports furnished by market news personnel are summarized. All of these data are analyzed to determine significant price changes, price trends, demand, changes in offerings, and marketing highlights. From these analyses, market situations are interpreted and the texts of the reports are written.

Sound interpretations of market behavior depend mainly on the experience and training of the market news specialist who prepares the reports. He must be familiar with certain patterns of price associations, peculiarities of the type of tobacco, buyers' practices, and other features characteristic of tobacco marketing. It is essential that the specialist have reliable, practical judgment derived from a background

of tobacco knowledge and familiarity with the subject.

The only reports prepared and issued from Washington are four *annual tobacco market reviews*—one applicable to markets for each of the following tobacco classes: flue-cured, fire-cured, light air-cured, and dark air-cured. These reports are prepared in bulletin form; they include pertinent statistics on all phases of the auction marketing system with comparisons for prior years. The statistical data are more comprehensive and in greater detail than are the data appearing in current market news reports. These reviews have proved to be valuable for use in the Department's operating programs, and they are also widely used for reference purposes by the tobacco trade.

By Melvin R. Banks

HISTORY

During the early years of the cold storage warehousing industry—40 to 50 years ago—information on management and practices of warehouses was completely lacking. As a result, it was inferred in some quarters that long-time storage was common. It was also charged that cold storage men used their plants for "cornering supplies" and for squeezing customers. Because of these criticisms the United States Department of Agriculture in September and October 1911 made an investigation of the cold storage business to determine whether such criticisms were justified. As the investigation progressed it also seemed desirable to ascertain whether the accusations that cold storage influenced prices were well-founded. Much information was collected, which included facts on stock movements into and out of storage as well as prices of such important storage commodities as butter, eggs, poultry, beef, mutton, and pork. The data themselves and a comprehensive analysis of them were published in a Department bulletin.[72] The conclusions reached refuted the contention that commodities were held for unduly long periods of time. It was shown that addition of storage charges, interest, and insurance costs over a long period to original costs of the commodities would so raise the prices as to prohibit profit to the owner, except in a period of rapidly rising prices.

Investigation of the cold storage industry was one of the major projects of the United States Department of Agriculture for the year 1911 and therefore was incorporated in the annual report of the Secretary of Agriculture for that year. The report gave a clean bill of health to the industry so far as the accusations made against it were concerned and concluded with recommendations which, in substance, were as follows: The affairs of such an industry as this should be reported. The public ought to know how much goods are in storage from month to month and what the movements into and out of storage are. Food warehousemen should be required to send to Washington monthly reports containing the desired information. In Washington, these reports could be aggregated and the results could be given to the public on a previously announced day of the

month, somewhat as are the crop reports.

This recommendation was not adopted until October 1914, when preparations were made to obtain periodic reports on holdings of apples in cold storage. The first report was compiled as of December 1, 1914. Thereafter, reports were compiled as of the first of each month until June 1, 1915. After a lapse of several months reports were resumed on October 15, 1915, and issued semimonthly as of the first and fifteenth of succeeding months until December 1, 1915. From that date until June 1 of the following year reports on apples were on a monthly basis. During 1916 cold storage reporting really got under way. Beginning with August of that year, the Bureau of Markets obtained reports on stocks of creamery butter and shell eggs. American cheese was added to the list of commodities on the schedule for September 1, and frozen and cured beef, lamb, mutton, pork, and lard were included in the reporting schedule for December 1. Frozen eggs and poultry were added for the report of May 1, 1917. Further enlargements and refinements have since been made from time to time. At present the cold storage schedule contains 83 classifications of foodstuffs in storage. (See MF–16, Appendix D). Cold storage reporting by warehousemen at present is entirely voluntary, although during World Wars I and II the exigencies of war required that reporting of food supplies be made mandatory.

TYPES OF WAREHOUSES

Cold Storage warehouses are classified as follows:

1. *Public general cold storage:* Any artificially cooled warehouse, the operator of which is engaged in storing food commodities requiring refrigeration for others for pay.
2. *Private general cold storage:* Any artificially cooled warehouse, the operator of which conducts a warehousing business to facilitate his main function as a producer, processor, or distributor but does not store commodities for others for pay.
3. *Semi-private general cold storage:* Any artificially cooled warehouse, the operator of which uses part of the space to care for the storage of his own commodities and, in addition, stores various food commodities for others in his plant for pay.
4. *Meat-packing establishment:* Any plant engaged in processing animals and animal products for food. For the purpose of this report and survey only that space which is used for storage of products is included. Working space, chill rooms,

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[72] Bulletin #101, Bureau of Statistics, United States Department of Agriculture, 1913.

and coolers used exclusively for hanging dressed carcasses before shipping are excluded.

5. *Apple house:* Any warehouse, public, private, and semi-private, the owner and operator of which is engaged mainly or exclusively in the storage of apples, particularly during the apple season.

All warehousemen, food processors, and meat packers having artificially refrigerated storage space wherein food commodities are at any time stored for 30 days or more, are asked to submit a cold storage schedule on stocks in storage, except for businesses having only the following:

1. Space in a plant operated as part of an established wholesale food business (that is, purchase and resale of food products without materially changing their form or quality for distribution within a 30-day period to independent retail outlets or institutional commercial users).
2. Space used solely as part of an established retail food business, hotel, or other such establishment where persons are fed.
3. Space occupied by individual lockers of 25 cubic feet or less.

Inasmuch as the reporting system is voluntary, it is the responsibility of the Cold Storage Reports Unit to keep informed of new warehouses being built for commercial food storage. Trade papers, journals, and other literature often provide the names of these new plants. A letter explaining the need for reporting and a copy of the monthly report to show the use made of the data collected are sent to each new warehouseman.

A master file, containing a card for every cold storage warehouse that is now or has been in operation at any time since reporting started in 1916, is maintained so that change in ownership or cessation of business and other pertinent information may be permanently recorded. All prospective respondents are recorded in this master file whether they are reporting stocks or not.

METHODOLOGY

All operators of cold storage plants receive during the last week of the month a monthly cold storage schedule (Form MF–16) which is to be returned to the Washington office within five working days after the first of the month. Each schedule bears the name and address of the plant and the numerical code ascribed to it. Along with each schedule there is enclosed, for the warehouseman's convenience, a self-addressed envelope, which requires no postage for making his return. About 95 percent of the schedules are returned in time to be used in the current report. As each schedule is received in the Washington office, it is recorded on a check-in card. These cards, one for each operating plant, show at a glance the reporting record of all cold storage warehouses. The cold storage schedule is then attached to the previous month's report and checked for completeness and accuracy. Any questionable entry is confirmed by wire or letter.

The tabulation of the data recorded on each cold storage schedule is performed by business machines. Every classification of commodity is given a numerical code and the quantity of each commodity is punched on a machine card under the appropriate code. As there are approximately 1,800 cold storage plants in the nation and reports are received from every State, numerical coding is also used to identify the plants, the nature of their operations, and their geographical location. By employing a seven- or nine-digit code, it is possible to locate readily each warehouse and at the same time provide for tabulation of cold storage stocks by States and regions.

As the Cold Storage Report is released at 2:00 p.m. on the 15th of the month, judgment estimates are made for individual plants where schedules for the current month are not received by the morning of the 13th; this is done so that the totals from one month to the next are comparable. These individual-plant estimates are based on the normal seasonal movement of commodities determined from historical data, usually the last 5-year average. These estimated reports of stocks in storage, along with those submitted by the plant operators, are sent to the machine section to be punched on machine cards and tabulated, as prescribed, for presentation in the Cold Storage Report. Late schedules (those received after the report is released) are substituted for the estimated schedules and revised commodity totals are published in the succeeding month's Cold Storage Report.

In addition to commodity reports, warehousemen also supply data on utilization of cooler and freezer space in their warehouses. These reports are treated as are the commodity reports; that is, they are edited for completeness and accuracy and, when necessary, estimated data are inserted when reports are not received on time. Machine tabulation provides the breakdown necessary for presentation in the Cold Storage Report in such detail as occupancy in public, private, and semi-private warehouses, meat-packing plants, and apple houses. Occupancy in selected cities is also included in the report.

On the day before the report is to be released, the summarized data from the machine tabulations are entered on rough drafts, which are prepared in advance to conform to the format of the Cold Storage Report. From these work sheets, the data are transferred to stencils for

mimeographing on the morning of the 15th of the month.

RELEASE OF REPORT

When the cold storage figures have been tabulated and compiled, a release is wired to some 70 Field offices of the Market News Services of the Department of Agriculture, located in the leading market centers. The report is published in these offices at the same time it is made available to the press in Washington. The value attached to these reports is indicated by the large demand for them and the prominence with which they are featured in the general press and trade papers, magazines, and journals. The report is distributed to the public by three principal means—direct mailing from Washington, D. C., release through area Production and Marketing Administration Information Service offices, and inclusion of cold storage information in commodity market news reports. Distribution through these outlets is approximately as follows during the course of a year:

Direct mailing of published report.....	28,000
Release through Area Information Service offices	7,500
Annual total of commodity market news reports with cold storage information	280,500
Total distribution	316,000

Cold Storage Reports are mailed directly from Washington only upon specific request. Additional information is supplied upon special request to persons desiring more detailed data. Any person or firm not located in Washington or in cities where branch offices exist may, upon request, receive the reports or any part of them by telegraph, charges collect. As an illustration of the extent of distribution through the information offices, a check with the Chicago office shows that it releases the monthly report received by wire to 3 wire news services; 6 daily newspapers; 3 trade papers;

314 farm, trade, or industry publications and associations; 8 State Commissioners of Agriculture; 8 extension editors; 96 PMA commodity branch representatives; and one bank.

Most States do not issue reports covering cold storages. An effort has been made, therefore, to supply information on storage holdings to any State agency requesting this information for that State. Such information is supplied monthly to New York, Virginia, and Texas. Cooperative arrangements have been made to improve the returns from some States that have reporting laws. Like arrangements have been made with Connecticut, Massachusetts, New York, Vermont, and Virginia. This cooperation has proved mutually beneficial to the States concerned and to the Federal Government.

SPECIAL REPORTS

In addition to the regular monthly cold storage report, the following special reports on cold storages are rendered from time to time:

1. *Annual Summary:* First of the month holdings of various commodities for the calendar year are published in summary form for ready reference. This publication gives monthly data by regions, and contains, in addition, 5-year average holdings and selected charts.
2. *A Survey of the Capacity of Cold Storage Warehouses:* The space survey which has been conducted biennially since 1921 shows total refrigerated warehouse capacity in the United States. Data on refrigerated space, classified as to sharp freezer (0° F. and below), freezer (0° F. to 29° F.) and cooler space (30° F. to 50° F.), are collected by special questionnaires from all cold storage operators. Capacities by warehouse classification, and by city, State, and region, are published in detail in this biennial report.
3. *Other Services:* Numerous services are rendered to trade groups of all kinds, such as evaluation of storage requirements for apples and pears or locating space for poultry, eggs and other products during a period when there is likely to be a shortage of space for storing these products.

PART III. APPENDIXES

APPENDIX A. LAWS GOVERNING CROP REPORTS

(All references are to United States Code)

GENERAL

Title 5, Section 511

Establishment of Department.—There shall be at the seat of government a Department of Agriculture, the general design and duties of which shall be to acquire and to diffuse among the people of the United States useful information on subjects connected with agriculture, in the most general and comprehensive sense of that word, and to procure, propagate, and distribute among the people new and valuable seeds and plants. (R.S. § 520) (5 U.S.C. 511).

Title 5, Section 514·

General duties of Secretary.—The Secretary of Agriculture shall procure and preserve all information concerning agriculture which he can obtain by means of books and correspondence, and by practical and scientific experiments, accurate records of which experiments shall be kept in his office, by the collection of statistics, and by any other appropriate means within his power; he shall collect new and valuable seeds and plants; shall test, by cultivation, the value of such of them as may require such tests; shall propagate such as may be worthy of propagation; and shall distribute them among agriculturists. (R.S. § 526) (5 U.S.C. 514).

Title 7, Section 411a

Monthly crop report; contents; issuance; approval by Secretary of Agriculture.—The monthly crop report, which shall be gathered as far as practicable from practical farmers, shall be printed and distributed on or before the twelfth day of each month, and shall embrace statements of the conditions of crops by States, in the United States, with such explanations, comparisons, and information as may be useful for illustrating the above matter, and it shall be submitted to and officially approved by the Secretary of Agriculture, before being issued or published. Mar. 4, 1909, c. 301, 35 Stat. 1053; Mar. 4, 1917, c. 179, 39 Stat. 1157. (7 U.S.C. 411a).

Title 18, Section 1902

Disclosure of crop information and speculation thereon.—Whoever, being an officer, employee or person acting for or on behalf of the United States or any department or agency thereof, and having by virtue of his office, employment or position, become possessed of information which might influence or affect the market value of any product of the soil grown within the United States, which information is by law or by the rules of such department or agency required to be withheld from publication until a fixed time, willfully imparts, directly or indirectly, such information, or any part thereof, to any person not entitled under the law or the rules of the department or agency to receive the same; or, before such information is made public through regular official channels, directly or indirectly speculates in any such product by buying or selling the same in any quantity, shall be fined not more than $10,000 or imprisoned not more than ten years, or both.

No person shall be deemed guilty of a violation of any such rules, unless prior to such alleged violation he shall have had actual knowledge thereof. June 25, 1948, c. 645, § 1, 62 Stat. 790. (18 U.S.C. 1902).

Title 18, Section 2072

False crop reports.—Whoever, being an officer or employee of the United States or any of its agencies, whose duties require the compilation or report of statistics or information relating to the products of the soil, knowingly compiles for issuance, or issues, any false statistics or information as a report of the United States or any of its agencies, shall be fined not more than $5,000 or imprisoned not more than five years, or both. June 25, 1948, c. 645, § 1, 62 Stat. 795. (18 U.S.C. 2072).

COTTON

Title 7, Section 471

Statistics and estimates of grades and staple length of cotton; collection and publication.—The Secretary of Agriculture is authorized and directed to collect and publish annually, on dates to be announced by him, statistics or estimates concerning the grades and staple length of stocks of cotton, known as the carry-over, on hand on the 1st of August of each year in warehouses and other establishments of every character in the continental United States; and following such publication each year, to publish, at intervals in his discretion, his estimate of the grades and staple length of cotton of the then current crop: Provided, That not less than three such estimates shall be published with respect to each crop. In any such statistics or estimates published, the cotton which on the date for which such statistics are published may be recognized as tenderable on contracts of sale of cotton for future delivery under chapter 14 of Title 26, shall be stated separately from that which may be untenderable under said chapter. (Mar. 3, 1927, ch. 337, § 1, 44 Stat. 1372.)

Title 7, Section 476

Acreage reports.—The Secretary of Agriculture shall cause to be issued a report on or before the 10th day of July of each year showing by States and in toto the number of acres of cotton in cultivation on July 1, to be followed on September 1 and December 1 with an estimate of the acreage of cotton abandoned since July 1. May 27, 1912, c. 135, § 1, 37 Stat. 118; Mar. 3, 1927, c. 337, § 6, 44 Stat. 1374. (7 U.S.C. 476).

Title 7, Section 475

Cotton crop reports. The Secretary of Agriculture shall discontinue making his reports based upon farmers' intention to plant cotton and shall cause to be issued after August 8, 1946, only five reports, one as of August 1, one as of September 1, one as of October 1, one as of November 1, and one as of December 1, each of which shall state the condition and progress of the crop and the probable number of bales which will be ginned, these reports to be issued simultaneously with the cotton-ginning reports of the Bureau of the Census relating to the same dates, the two reports to be issued from the same place at 11 o'clock antemeridian of the eighth day following that to which the respective reports relate. When such date of release falls on Sunday, a legal holiday, or other day which pursuant to statute or Executive order is a nonworkday in the Department of Agriculture at Washington generally, the report shall be issued at 11 o'clock antemeridian of the next succeeding workday. No such report shall be approved and released by the Secretary of Agriculture until it shall have been passed upon by a cotton-crop reporting committee or board consisting of five members or more to be designated by him, not less than three of which shall be supervisory field statisticians of the Department of Agriculture located in different sections of the cotton-growing States, experienced in estimating cotton production and who shall have first hand knowledge of the condition of the cotton crop based upon recent field observations, and the majority of which committee or board shall be familiar with the methods and practices of producing cotton. May 3, 1924, c. 149, § 1, 43 Stat. 115; Mar. 3, 1927, c. 337, § 5, 44 Stat. 1373. As amended Aug. 8, 1946, ch. 909, 60 Stat. 940. (7 U.S.C. 475).

Title 13, Section 72

Contents and distribution of reports; publication by Department of Agriculture.—The statistics of the quantity of cotton ginned shall show the quantity ginned from each crop prior to August 1, August 16, September 1, September 16, October 1, October 18, November 1, November 14, December 1, December 13, January 16, and March 1: Provided, That the Director of the Census may limit the canvasses of August 1 and August 16, to those sections of the cotton-growing States in which cotton has been ginned. The quantity of cotton consumed in manufacturing establishments, the quantity of baled cotton on hand, the number of active consuming cotton spindles, the number of active spindle hours, and the statistics of cotton imported and exported shall relate to each calendar month, and shall be published as soon as possible after the close of the month. Each report published by the Bureau of the Census of the quantity ginned shall carry with it the latest available statistics concerning the quantity of cotton consumed, stocks of baled cotton on hand, the number of cotton-consuming spindles, and the quantity of cotton imported and exported.

All of these publications containing statistics of cotton shall be mailed by the Director of the Census to all cotton ginners, cotton manufacturers, and cotton warehousemen, and to all daily newspapers throughout the United States. The Director of the Census shall furnish to the Department of Agriculture, immediately prior to the publication of each report of that bureau regarding the cotton crop, the latest available statistics mentioned in this and the preceding section and the said Department of Agriculture shall publish the same in connection with each of its reports concerning cotton. (Apr. 2, 1924, c. 80, § 2, 43 Stat. 31.) (13 U.S.C. 72).

Title 12, Section 114lj (d)

Governmental publications; predictions as to cotton prices prohibited.—The inclusion in any governmental report, bulletin, or other such publication hereafter issued or published of any prediction with respect to cotton prices is hereby prohibited. Any officer or employee of the United States who authorizes or is responsible for the inclusion in any such report, bulletin, or other publication of any such prediction, or who knowingly causes the issuance or publication of any such report, bulletin, or other publication containing any such prediction, shall, upon conviction thereof, be fined not less than $500 or more than $5,000, or imprisoned for not more than five years, or both: Provided, That this subdivision shall not apply to the Governor of the Farm Credit Administration when engaged in the performance of his duties herein provided.

Annual appropriation acts (Office of the Secretary) contain a similar prohibition in this form, "Provided further, That no part of the funds appropriated by this Act shall be used for the payment of any officer or employee of the Department who, as such officer or employee, or on behalf of the Department or any division, commission, or bureau thereof, issues, or causes to be issued, any prediction, oral or written, or forecast, except as to damage threatened or caused by insects and pests, with respect to future prices of cotton or the trend of same:"

Title 13, Section 72a

Contents of reports; separate item of number of bales of linter.—In collecting and publishing statistics of cotton on hand in warehouses and other storage establishments, and of cotton known as the "carry over" in the United States, the Director of the Census is hereby directed to ascertain and publish as a separate item in the report of cotton statistics the number of bales of linters as distinguished from the number of bales of cotton. (June 27, 1930, c. 639, 46 Stat. 821). (13 U.S.C. 72a).

The act cited to the text was entitled "An Act authorizing the Director of the Census to collect and publish certain additional cotton statistics."

Title 13, Section 75

Foreign cotton statistics.—In addition to the information regarding cotton in the United States provided for in sections 71, 72, and 74, the Director of the Census shall compile, by correspondence or the use of published reports and documents, any available information concerning the production, consumption, and stocks of cotton in foreign countries, and the number of cotton-consuming spindles in such countries. Each report published by the Bureau of the Census regarding cotton shall contain an abstract of the latest available information obtained under the provisions of this section, and the Director of the Census shall furnish the same to the Department of Agriculture for publication in connection with the reports of that department concerning cotton in the same manner as in the case of statistics relating to the United States. (Apr. 2, 1924, c. 80, § 5, 43 Stat. 32.) (13 U.S.C. 75).

Title 13, Section 76

Simultaneous publication of cotton reports.—The reports of cotton ginned to the dates as of which the Department of Agriculture is also required to issue cotton crop reports shall be issued simultaneously with the cotton crop reports of that department, the two reports to be issued from the same place at eleven o'clock antemeridian on the eighth day following that on which the respective reports relate. When such date of release falls on Sunday or a legal holiday the reports shall be issued at eleven o'clock antemeridian on the

next succeeding workday. (Apr. 2, 1924, c. 80, § 6, 43 Stat. 32) (13 U.S.C. 76).

APPLES

Title 7, Section 411b

Estimates of apple production.—Estimates of apple production shall be confined to the commercial crop. June 30, 1939, c. 253, Title I, 53 Stat. 968; and all subsequent annual appropriation acts.

NAVAL STORES

Title 5, Section 556b

Statistics relating to turpentine and rosin.—The Secretary of Agriculture is authorized and directed to collect and/or compile and publish annually, and at such other times, and in such form and on such date or dates as he shall prescribe, statistics and essential information relating to spirits of turpentine and rosin produced, held, and used in the domestic and foreign commerce of the United States. (Aug. 15, 1935, c. 548, 49 Stat. 653.) (5 U.S.C. 556b).

PEANUTS

Title 7, Section 951

Collection and publication; facts required; submission of report.—The Secretary of Agriculture is hereby authorized and directed to collect and publish statistics of raw peanuts, shelled, unshelled, and crushed, and peanut oil, in the United States, received, processed, shipped, and owned by or in the possession of warehousemen, brokers, cleaners, shellers, dealers, growers' cooperative associations, crushers, salters, manufacturers of peanut products, and owners other than the original producers of peanuts: Provided, That the Secretary may, in his discretion, omit for any period of time to collect such statistics from any or all salters of peanuts or manufacturers of peanut products who used, during the calendar year preceding that for which statistics are being collected, less than thirty thousand pounds of shelled and unshelled peanuts. Such statistics shall show the quality of peanuts in such details as to kinds—Virginias, Runners, Spanish, and imported varieties—as the Secretary shall deem necessary for the purposes of this chapter. All reports except those required from persons owning or operating peanut picking or threshing machines shall be sub-

mitted monthly in each year. June 24, 1936, c. 745, § 1, 49 Stat. 1898; May 12, 1938, c. 199, § 1, 52 Stat. 348. (7 U.S.C. 951).

TOBACCO

Title 7, Section 501

Collection and publication; facts required; deteriorated tobacco.—The Secretary of Agriculture is authorized and directed to collect and publish statistics of the quantity of leaf tobacco in all forms in the United States and Puerto Rico, owned by or in the possession of dealers, manufacturers, quasi-manufacturers, growers' co-operative associations, warehousemen, brokers, holders, or owners, other than the original growers of tobacco. The statistics shall show the quantity of tobacco in such detail as to types, groups of grades, and such other subdivisions as to quality, color, and/or grade for particular types, as the Secretary of Agriculture shall deem to be practical and necessary for the purposes of this section and sections 502 to 508 of this title, shall be summarized as of January 1, April 1, July 1, and October 1 of each year, and an annual report on tobacco statistics shall be issued: Provided, That the Secretary of Agriculture shall not be required to collect statistics of leaf tobacco from any manufacturer of tobacco who, in the first three quarters of the preceding calendar year, according to the returns of the Commissioner of Internal Revenue or the record of the Treasurer of Puerto Rico, manufactured less than thirty-five thousand pounds of tobacco, or from any manufacturer of cigars who, during the first three quarters of the preceding calendar year, manufactured less than one hundred and eighty-five thousand cigars, or from any manufacturer of cigarettes who, during the first three quarters of the preceding year, manufactured less than seven hundred and fifty thousand cigarettes: And provided further, That the Secretary of Agriculture may omit the collection of statistics from any dealer, manufacturer, growers' cooperative association, warehouseman, broker, holder, or owner who does not own and/or have in stock, in the aggregate, fifty thousand pounds or more of leaf tobacco on the date as of which the reports are made. For the purposes of this section and sections 502 to 508 of this title, any tobacco which has deteriorated on account of age or other causes to the extent that it is not merchantable or is unsuitable for use in manufacturing tobacco products shall be classified with other nondescript tobacco and reported in the "N" group of the type to which it belongs. Jan. 14, 1929, c. 69, § 1, 45 Stat. 1079; July 14, 1932, c. 480, § 1, 47 Stat. 662; Aug. 27, 1935, c. 749, § 1, 49 Stat. 893. (7 U.S.C. 501).

The Official Regulations of the Department of Agriculture concerning the preparation of the Department's agricultural estimates are as follows:

SECTION 5—CROP REPORTING BOARD

325. AUTHORITIES AND FUNCTIONS. (S)—There shall be in the Bureau of Agricultural Economics a Crop Reporting Board, the primary function of which shall be to prepare and issue, as provided in paragraph 328 and elsewhere in this regulation, the official State and National estimates and reports of the Department relating to crop production, livestock and livestock products, numbers of livestock on farms, stocks of agricultural commodities, local market prices, value of farm products, and such other subjects as the Chief of the Bureau may direct. Among these reports shall be a Monthly Crop Report, which shall be issued on or before the 10th of each month as provided in the Act of March 4, 1909 (35 Stat. 1053, 7 U.S.C. 411a), and the Cotton Report to be issued on the 8th day of each month from August to December, or, if the 8th day is a nonwork day, on the next succeeding workday, as provided in the Act of May 3, 1924 (43 Stat. 115, 7 U.S.C. 475), the Act of April 2, 1924 (43 Stat. 31, 13 U.S.C. 72, 75, 76), the Act of March 3, 1927 (44 Stat. 1373, 7 U.S.C. 475) and the Act of August 8, 1946 (Public Law 689—79th Congress).

326. DEFINITIONS.—Wherever Department, Bureau, staff, or Board is mentioned herein, the Department of Agriculture, the Bureau of Agricultural Economics, the Agricultural Estimates staff, or the Crop Reporting Board is meant. Wherever Chairman is mentioned, the Assistant Chief of Bureau in charge of Agricultural Estimates is meant. Wherever any official is mentioned by title of position, the term shall include any person properly acting in his stead.

327. ORGANIZATION OF BOARD. a. *Chairman.*—The Chairman of the Board shall call and preside over all meetings of the Board. The Assistant Chief in charge of Agricultural Estimates shall issue the necessary instructions to the staff for gathering, compiling, and summarizing data for reports specified in paragraph 328, and shall approve the statistical techniques and procedures to be followed by the staff and by the Board in analyzing, interpreting, and reviewing the pertinent data and in preparing the official estimates for each report.

b. *Members.*—The Chairman shall select the members of the Board for each report from the Agricultural Estimates staff. For the Monthly Crop Report the Board shall have not less than five members in addition to the Chairman, not less than two of whom shall be selected from the staff in the field offices. For the Cotton Report the Board shall have not less than five members, of whom not less than three members shall be supervisory field statisticians located in different sections of the cotton growing States, experienced in estimating cotton production and who have first-hand knowledge of the condition of the cotton crop based on recent field observations, and a majority of the Board shall be familiar with the methods and practices of producing cotton, as provided in the Act of May 3, 1924. For the Annual Cotton Crop Summary in April, the Annual Crop Production Summary in December, the Winter

Wheat and Rye Seedings Report as of December 1, the Prospective Plantings Report as of March 1, the Annual Livestock Summary as of January 1, and the Pig Crop Reports as of June 1 and December 1, the Board shall consist of not less than five members, of whom not less than two shall be selected from the staff of the field offices.

c. *Secretary.*—The Board shall have a permanent Secretary, who shall be selected from the professional Agricultural Estimates staff in Washington. He shall assist in preparing instructions and forms for collecting, compiling, summarizing, and analyzing statistical information for the use of the Board, shall arrange for suitable means for transmission of instructions, records, and reports to and from the field offices, shall maintain records of the information assembled, including a record of the official estimates prepared by the Board, and shall maintain a file of the signed copies of Board reports. For each report the Secretary shall assemble and collate information for the use of the Board, issue proper notices of Board meetings, and make necessary arrangements for the preparation, signing, and release of reports in such manner and at such times as are herein described.

328. REPORTS. a. *Reports to be approved by the Secretary.*—The following Board reports shall be signed by the Chairman, Secretary, and members of the Board, and shall be approved by the Secretary of Agriculture before being issued or published:

> Monthly Crop Reports, except for February, March, and December (see paragraph 325).
> Cotton Reports (see paragraph 325).
> Annual Cotton Crop Summary in April.
> Annual Crop Production Summary in December.
> Winter Wheat and Rye Seedings Report as of December 1.
> Prospective Plantings Report as of March 1.
> Annual Livestock Summary as of January 1.
> Pig Crop Reports as of June 1 and December 1.

b. *Other board reports.*—Such other reports as are designated by the Chairman shall be prepared and issued as Board reports. For each such report, the Chairman shall select Board members from the staff in such manner and in such numbers as may be deemed necessary. Such reports shall be signed by the members of the Board who prepared them and be approved by the Chairman before being issued.

c. *Annual release schedule.*—On or before the first day of December of each year there shall be prepared a schedule for the ensuing year setting forth dates and hours of release of all regular statistical reports listed in subparagraph "a" above for which the approval of the Secretary of Agriculture is required. The schedule of reports shall be effective when approved by the Secretary of Agriculture and may be amended at any time with his approval. Subsequently, there shall also be prepared and issued, to the extent possible, an advance listing of the reports referred to in subparagraph "b" above, together with dates of publication or issuance.

329. COLLECTION OF INFORMATION.—For use in preparing the official estimates of the Department, in-

formation relating to agriculture shall be gathered through the Washington and field offices of the Agricultural Estimates staff, as far as practicable, from practical farmers, as provided in the Act of March 4, 1909 (7 U.S.C. 411a) ; from peanut processors, as provided by the Act of June 24, 1936, as amended, (7 U.S.C. 951 et seq.) ; from processors, dealers, cooperating State and local officials, agencies in the Department; and from other sources. This information shall be collected by mailed questionnaire, by sample enumeration, by interviews, or by other appropriate means. (7 U.S.C. 411a, 951)

330. INFORMATION NOT TO BE RELEASED; SPECULATION; FALSE STATISTICS. a. *Withholding Information.*— The contents and every part of the contents of each and every report specified in paragraph 328a, and the information and every part of the information utilized in the preparation of such reports, shall be withheld from publication until the day and hour provided for the issuance of the reports in the schedule approved by the Secretary of Agriculture and amendments thereto.

b. *Access to information.*—No member of the Board or other persons engaged in the preparation of information for reports shall, before the release of any Board report provided for herein, willfully impart or permit access to any information contained therein or any part thereof, directly or indirectly, to any person not entitled under the law and rules of the Department to receive the same. The Chairman may under this regulation notify officers in charge of field offices, in advance of publication, of changes made by the Board from recommendations submitted by such officers for nonspeculative items as defined in paragraph 331a(2).

c. *Statutory provisions.*

(c) "Whoever, being an officer or employee of the United States or a person acting for or on behalf of the United States, in any capacity under or by virtue of the authority of any department or office thereof, and while holding such office, employment, or position shall, by virtue of the office, employment, or position held by him, become possessed of any information which might exert an influence upon or affect the market value of any product of the soil grown within the United States, which information is by law or by the rules of the department or office required to be withheld from publication until a fixed time, and shall willfully impart, directly or indirectly, such information, or any part thereof, to any person not entitled under the law or the rules of the department or office to receive the same; or shall, before such information is made public through regular official channels, directly or indirectly speculate in any product respecting which he had thus become possessed of such information, by buying or selling the same in any quantity, shall be fined not more than $10,000 or imprisoned not more than 10 years, or both: Provided, that no person shall be deemed guilty of a violation of any such rule unless prior to such alleged violation he shall have had actual knowledge thereof." (Act of March 4, 1909, 18 U.S.C. 214)

(2) "Whoever, being an officer or employee of the United States and whose duties require the compilation or report of statistics or information relative to the products of the soil, shall knowingly compile for issuance, or issue, any false statistics or information as a report of the United States shall be fined not more than $5,000 or imprisoned not more than five years, or both." (Act of March 4, 1909, 18 U.S.C. 215)

331. SPECULATIVE AND NONSPECULATIVE DATA. a. *Definition.*—Data used by the Board in the preparation of the Monthly Crop Report and the Cotton Report shall be classified as follows:

(1) *Speculative data.*—Speculative data are defined to be data relating to corn, wheat, oats, or cotton, the assembling and collating of which would make it possible for any member, members, or assistants of the Board approximately to anticipate the Board's forthcoming report for the United States on the condition, yield, probable production, or farm stocks of designated commodities, or the acreage or ginnings of cotton. These data shall be deemed to be speculative for:

(a) *Corn* in Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Ohio, South Dakota, and Wisconsin.

(b) *Winter wheat* in Illinois, Indiana, Kansas, Missouri, Montana, Nebraska, Ohio, Oklahoma, Texas, and Washington.

(c) *Spring wheat* in Idaho, Minnesota, Montana, North Dakota, South Dakota, and Washington.

(d) *Oats* in Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

(e) *Cotton* in Arkansas, Louisiana, Mississippi, Oklahoma, and Texas.

(2) *Nonspeculative data.*—Nonspeculative data are defined to be any statistical data other than the speculative data defined in paragraph (1) above.

b. *Transmission.*

(1) *Field procedure.*—Summaries of speculative data collected in the field offices, together with recommendations of the officer in charge of each such office, shall be transmitted by mail or telegraph to the Secretary of Agriculture. When transmitted by mail, the summaries and recommendations shall be forwarded in a sealed envelope marked "Special A." When transmitted by telegraph, the summary and recommendations shall be forwarded in a secret code provided by the Secretary of the Board. Nonspeculative data may at all times be forwarded directly to the Secretary of the Board by the officers in charge of the field offices.

(2) *Departmental procedure.*—The officer in charge of the Department Telegraph Office shall place each telegram received by him containing speculative crop report data in a sealed envelope marked "Special A" and deliver such envelope by special messenger to the Office of the Secretary of Agriculture.

c. *Custody of "special A" envelopes.*—All "Special A" envelopes containing speculative crop report data received in the Office of the Secretary of Agriculture shall, immediately upon receipt and without breaking the seals thereof, be placed in the locked box provided for that purpose in the Office of the Secretary of Agriculture.

d. *Opening of "special A" envelopes.*—Immediately preceding the convening of the Board on the day a report is to be published, the locked box in the Office of the Secretary of Agriculture containing the "Special A" envelopes shall be opened and the envelopes removed in the presence of a designated representative of the Secretary of Agriculture, the Chairman, Secretary, and one other member of the Board, and a special guard provided by the Office of the Secretary of Agriculture. The Chairman, Secretary, and other member

of the Board, accompanied by the guard, shall then proceed directly to the Board rooms.

332. BOARD ROOMS. a. *Definition.*—The Board rooms shall consist of the Board room proper and all other rooms occupied during the locked-in session of the Board by clerks, stenographers, and others engaged in assisting the Board in the preparation of the report.

b. *Safeguards against communication of information.*—Previous to the arrival of the Board representatives and guard with the sealed "Special A" envelopes, the Secretary of the Board shall have caused all windows in the Board rooms to be sealed in such manner as to prevent communication between persons within the Board rooms and persons outside, and the officer in charge of the Department's branch telephone exchange shall have caused to be disconnected all telephones, buzzers, and similar means of communication from the Board rooms. Immediately after the entrance of the Board representatives into the Board rooms, with the sealed "Special A" envelopes, the guard shall lock all doors leading from the Board rooms, and remain on watch until the report is released. While on watch, the guard shall not permit any communication between persons within the Board rooms and persons outside except as provided below. The guard shall unlock the door only to permit:

(1) The entrance of:

(a) The Secretary of Agriculture.

(b) The Chief of the Bureau.

(c) Officials of the Bureau of the Census who cooperate in issuing the Joint Cotton Ginning and Production Report.

(d) Employees of the Agricultural Estimates staff and other persons whose presence is required in the preparation of the report, and who have written permission from the Chairman.

(e) Other officials and employees of the Department of Agriculture having written authority from the Secretary of Agriculture, or from the Chief of the Bureau.

(2) The delivery to the Board rooms of mail, telegrams, written communications, or supplies for use of the Board.

(3) Notification by the Chairman to the guard of delay in completion of a Board report (see subparagraph 333d) or to convey emergency instructions essential to completion of a report.

(4) The departure of:

(a) The Secretary of Agriculture, the Chairman, and such other persons as may be designated at the time by the Chairman, for the purpose of proceeding, under guard, to the room provided for the release of the report.

(b) Any person in the case of extreme emergency, in which event a member of the guard shall accompany and remain with such person until the release of the report.

(c) All persons in case of fire or other serious emergency.

333. APPROVAL AND RELEASE OF REPORTS. a. *Approval.*—Upon the completion of any Board reports specified in subparagraph 328a of these regulations, a copy must be signed by the Chairman, Secretary, and each member of the Board, and approved in writing by the Secretary of Agriculture before it is released. The Chairman, accompanied by a member of the guard and not less than two other persons, shall take copies of the approved report from the Board rooms to the release room before the time specified for the publication and release of the report.

b. *Release officer.*—The officer in charge of the Department's Telegraph Office shall act as release officer and shall provide in the release room suitable telegraph and telephone facilities for all persons desiring such facilities for the transmission of the report upon its official release.

c. *Procedure.*—Upon the arrival in the Board release room of the Chairman and persons accompanying him, the release officer shall cause all persons other than the Chairman to remain within a prescribed area until the release of the report, the limits of which area shall be not less than 6 feet from the telephones, telegraph instruments, and tables or shelves provided for distribution of copies of the report. The Chairman then shall place copies of the report, face down, beside each instrument, and additional copies, face down, upon the tables or shelves provided for that purpose. At the exact time provided for the official issuance of each report, the release officer shall inform those present that the report is released to the public and permit access to the copies of the report. The release officer then shall notify the guard at the door of the Board rooms that the report has been released and the guard thereupon shall unlock the doors of the Board rooms.

d. *Delay in releasing reports.*—In the event that the report should not be completed and approved for issuance at the designated time, the Chairman, within 10 minutes of the time designated for the release of the report, shall notify the guard of the time when the report will be ready for release. The guard immediately shall notify the release officer, who, in turn, shall notify all persons who are present in the release room for the purpose of receiving the report.

334. ACKNOWLEDGMENT OF REGULATION.—The Chairman shall cause to be delivered, or exhibited, a copy of this regulation to each employee of the staff or other person having access to crop report data in advance of publication. The head or an authorized representative shall obtain from each such person a certification which shall be an acknowledgment that such person has read this regulation and will be governed by it.

APPENDIX C-1. CALENDAR OF CROP REPORTS, 1949

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
CROP REPORTING BOARD

1949 CALENDAR 1949

CROP, LIVESTOCK, and LIVESTOCK PRODUCTS REPORTS

RELEASE DATES

RELEASE DATES 1949

Day	January	February	March	April	May	June	July	August	September	October	November	December
1	Sat.		Wool Production and Income 1948; Shipments of Package Bees	Chickens & Eggs Prod. & Income; Interstate Movement of Dairy Cattle			Fruit: Non-citrus Production and Utilization	Soybean and Flaxseed Stocks; Lamb Crop		Sat.		Production of Manufactured Dairy Products 1949
2	Sun.		Mohair Production and Income 1948	Sat.			Sat.		Livestock Slaughter	Sun.		Sat.
3		Livestock Slaughter	Livestock Slaughter	Sun.	Farm Disposition and Sales of Principal Field and Seed Crops	Livestock Slaughter	Sun.		Sat.			Sun.
4				Livestock Slaughter	Livestock Slaughter			Livestock Slaughter	Sun.		Livestock Slaughter	Sun.
5	Truck Crop News	Sat.	Sat.	Truck Crop News		Sat.	Hol.			Livestock Slaughter	Sat.	
6		Sun.	Sun.		Cotton Revisions; Truck Crop News	Sun.	Livestock Slaughter		Hol.		Sun.	Livestock Slaughter; Truck Crop News
7	Livestock Slaughter		Truck Crop News				Kentucky Bluegrass			Red Clover Seed; Truck Crop News		Cotton
8	Sat.		Truck Crop News	Sat.	Sat.	Truck Crop News	Truck Crop News	Sat.	Truck Crop News	Sat.		General; Truck Crops for Fresh Market; Farm Labor
9	Sun.			Sun.	Sun.			Sun.		Sun.	Cotton; Truck Crop News	Sat.
10	General; Truck Crops for Fresh Market and Processing	General; Truck Crops for Fresh Market; Farm Labor; Quarterly Naval Stores; Production of Meat Scraps and Tankage	General; Truck Crops for Fresh Market & Processing; Farm Labor; Early Lamb Crop	Sun.	General; Truck Crops for Fresh Market; Farm Labor	General; Truck Crops for Fresh Market and Processing; Farm Labor	Cotton	Cotton; Wool Production	Cotton	Cotton	General; Truck Crops for Fresh Market and Processing; Farm Labor	Sat.
11		Sat.	Young Chickens and Potential Layers on Farms	General; Truck Crops for Fresh Market & Processing; Farm Labor; Early Lamb Crop		General; Truck Crops for Fresh Market & Processing; Farm Labor; Peanut Particulars	General; Truck Crops for Fresh Market and Processing; Farm Labor	Stocks of Field Seeds	General; Truck Crops for Fresh Market & Processing; Farm Labor	General; Truck Crops for Fresh Market; Farm Labor; Honey Prod. & Stocks	Sat.	Sun.
12				Early Lamb Crop; Production of Meat Scraps and Tankage	Early Lamb Crop; Production of Meat Scraps and Tankage	Sat.	Hybrid Corn	Cattle on Feed	Sat.	Cattle Feeding Situation	Sat.	Cattle Feeding Situation
13	Farm Labor; Cattle on Feed	Sun.	Sat.	Quarterly Naval Stores	Quarterly Naval Stores	Sun.		Cattle on Feed	Sun.	Lamb Feeding Situation	Sun.	Lamb Feeding Situation
14	Farm Disposition & Sales of Fruit and Nut Crops	Potato Stocks	Hatchery; Potato Stocks	Cattle on Feed			Orchard Grass; Meadow Fescue	Quarterly Naval Stores; Production of Meat Scraps & Tankage	Sweetclover	Alfalfa Seed; Citrus Production and Utilization	Quarterly Naval Stores; Cattle Feeding Situation	Hatchery; Lamb Feed Situation; Prod. of Meat Scraps & Tankage
15	Sat.	Hatchery	Hatchery; Farm Production, Disposition & Income from Milk, 1948		Sat.	Hatchery	Hatchery; Apple Production by Varieties	Hatchery	Hatchery	Sat.	Sat.	Hatchery

APPENDIX C–2.   CALENDAR OF CROP REPORTS, 1949

Sat. - - - - Saturday   Sun. - - - - Sunday   Hol. - - - - Holiday

APPENDIX D-1. SPECIMENS OF SCHEDULES

[C. E. 2-8821]
"N"

MARCH 1949 ACREAGE SURVEY
REPORT FOR THE FARM OR PLANTATION YOU ARE OPERATING

FALL AND WINTER SEEDED CROPS	Acres for harvest this year 1949	Acres harvested last year 1948	
			1
1. Winter wheat for grain – – – – –			2
2. Winter rye for grain – – – –			3
3. Winter oats for grain – – – –			4
4. Winter barley for grain – – – –			

SPRING PLANTED CROPS	Acres to be planted this spring 1949	Acres planted last spring 1948	
			5
5. Corn for all purposes – – – – –			6
6. Spring oats – – –			7
7. Spring barley – – – –			8
8. Sorghums for all purposes			9
9. Irish potatoes (early) usually harvested before September 1			10
10. Irish potatoes (late) usually harvested after September 1			11
11. Sweetpotatoes and yams – – –			12
12. Dark-fired tobacco – – – – –			13
13. Burley tobacco – – – – –			14
14. Dark air-cured tobacco – – – –			15
15. Soybeans grown alone for all purposes			16
16. Cowpeas grown alone for all purposes –			17
17. Peanuts grown alone for all purposes –			18
18. Other spring planted crops – – –			

HAY CROPS	Acres to be cut for hay in 1949	Acres cut for hay in 1948	
			19
19. Alfalfa for hay – – – –			20
20. Clover and timothy, alone or mixed, for hay – – –			21
21. All other hay (radtop, Bermuda, Johnson, crab, orchard, Sudan, millet, lespedeza, wild and oiarsb grasses, etc.) –			

ORCHARDS, PASTURES, ETC.	Acres in 1949	Acres in 1948	
			22
22. Land in fruit orchards and vineyards			23
23. Pasture. Idle land, etc. – – – –			24
24. Acres of all land in this farm or plantation. (Include land rented from others) – – – – –			

Name _____ R. _____

Post office _____ State _____

County _____
(In which farm is located)

[OVER]

16—91019-2

[C. E. 2-8477]
"L"

JUNE 1948 ACREAGE SURVEY
REPORT FOR THE FARM OR PLANTATION YOU ARE OPERATING

1. ACRES OF ALL LAND IN THIS FARM OR PLANTATION, (Include land rented from others) – – – – – – – – (Acres) ____ 1
2. Land suitable for crops (all land available for cropping, whether planted to crops or idle this season; include orchards and hay land) – – – – (Acres) ____ 2
3. Land not suitable for crops (woodland, waste, and all other noncropland) – – – – – – – (Acres) ____ 3

(NOTE.—Total of questions 2 and 3 should equal questioo 1.)

	Acres for harvest this year (1948)	Acres harvested last year (1947)	
			4
4. Corn grown alone – – – – –			5
5. Corn interplanted with soybeans, cowpeas, or other crops – – – –			6
6. Wheat for grain____			7
7. Oats for grain (ioclude bundle oats)– – –			8
8. Barley for grain. – – – – –			9
9. Rye for grain. – – – – –			10
10. Sweet sorghum eaue for sirup – – – –			11
11. Sorghums for all other purposes____			12
12. Irish potatoes (early) for harvest before Sept. 1 – – – –			13
13. Irish potatoes (late) for harvest after Sept. 1 – – – –			14
14. Sweetpotatoes and yams – – – –			15
15. Tobacco____ (Name type of tobaeo grow by you)			16
16. Cotton____			17
17. Soybeans grown alone for all purposes. –			18
18. Soybeans interplanted io____ (Name crop)			19
19. Cowpeas grown alone for all purposes – –			20
20. Cowpeas interplaoted in____ (Name crop)			21
21. Peanuts growo alone – – – – –			22
22. Soybean, cowpea, and peanut hay (this may include all or part of the acreages shown uoder items 17-21)____			23
23. Alfalfa for hay – – – –			24
24. Clover and timothy, alone or mixed, for hay – – – –			25
25. Lespedesa for hay – – – – –			26
26. Grains for hay (wheat, oats, barley, rye, etc.) – – –			27
27. All other hay____			28
28. Orehard grass harvested and to be harvested for seed ____			29
29. Other crops (____ Names of erops)			

Name _____ R. _____

Post office _____ State _____

County _____
(In which farm is located)

[OVER]

16—91924-2

APPENDIX D–2. SPECIMENS OF SCHEDULES

Budget Bureau No. 40–R123.1.
Approval expires Nov. 30, 1949.

[C. E. 2-8597]
"E"

1948 ACREAGE SURVEY
Ohio, Ind.

POST OFFICE DEPARTMENT IN COOPERATION WITH THE UNITED STATES DEPARTMENT OF AGRICULTURE

Name .... R. ....
(Township)
Post office .... State ....
County ....
(In which farm is located)

REPORT FOR THE FARM YOU ARE OPERATING
For crops show acreage harvested and to be harvested this year

	Acres in 1948
1. ACRES OF ALL LAND IN THIS FARM. (Include land rented from others)	1
2. Corn for grain, silage, fodder, and hogging off - - - - -	2
3. All wheat for grain (acres harvested this year) - - - -	3
4. Winter wheat sown and to be sown this fall	4
5. Oats harvested for grain this year (include any cut ripe to feed unthreshed) - - - - -	5
6. Barley for grain - - - - - - - - - - - -	6
7. Mixed grains for grain (Name mixture)	7
8. Rye for grain (acres harvested this year) - - - -	8
9. Rye sown and to be sown this fall. - - - - -	9
10. Buckwheat (acres harvested this year)	10
11. Sorghums for all purposes - - - - - - - - -	11
12. Sugar beets for sugar - - - - - - - - - -	12
13. Potatoes - - - - - - - - - - - - - -	13
14. Tobacco	14
15. Popcorn - - - - - - - - - - - - - -	15
16. Cowpeas grown alone for all purposes - - - -	16
17. Soybeans for beans	17
18. Soybeans cut for hay - - - - - - - - -	18
19. Alfalfa cut for hay - - - - - - - - - -	19
20. Clover and timothy, alone or mixed, cut for hay -	20
21. Lespedeza cut for hay - - - - - - - - -	21
22. All other hay cut	22
23. Alfalfa cut for seed - - - - - - - - - -	23
24. Red clover cut for seed (include mammoth) - - -	24
25. Alsike clover cut for seed - - - - - - - -	25
26. Sweetclover cut for seed - - - - - - - -	26
27. Timothy cut for seed	27
28. Truck and vegetable crops for processing and for market	28
29. Other crops (not listed above) (Give names)	29
30. Land in fruit orchards and vineyards - - - - -	30
31. Land used this year for pasture only - - - - -	31
32. Plowland idle this year (not used for crops or pasture) -	32
33. Crop failure (not harvested, not pastured) - - - -	33

[OVER] 16—53033-2

Budget Bureau No. 40–R127.1.
Approval expires Dec. 31, 1949.

[C. E. 2-8724]
"F"
Illinois

ACREAGE AND PRODUCTION OF PRINCIPAL CROPS
NOVEMBER 1948

REPORT FOR THE FARM YOU ARE OPERATING

PRINCIPAL CROPS, 1948	Acres harvested and to be harvested	Quantity harvested and to be harvested	
1. Corn for grain - - - - - - - - -			bu. 1
2. Corn for silage - - - - - - -			tons 2
3. Corn cut to be fed dry without husking - - - - -			tons 3
4. Corn hogged off, pastured, or grazed		× × × ×	4
5. Winter wheat for grain - - - -			bu. 5
6. Spring wheat for grain			bu. 6
7. Oats for grain - - - - - - -			bu. 7
8. Oats cut green for hay - - - -			tons 8
9. Barley for grain - - - - - - -			bu. 9
10. Rye for grain - - - - - - -			bu. 10
11. All sorghums for grain. Include all heads cut, both threshed and unthreshed			bu. 11
12. All sorghums for silage - - - -			tons 12
13. All sorghums for hay and fodder -			tons 13
14. Potatoes, Irish - - - - - -			bu. 14
15. Soybeans for beans - - - - -			bu. 15
16. Soybeans cut for hay - - - - -			tons 16
17. Cowpeas for peas - - - - - -			bu. 17
18. Cowpeas cut for hay			tons 18
19. Alfalfa cut for hay - - - - -			tons 19
20. Clover and timothy, alone or mixed, cut for hay - - - - -			tons 20
21. Lespedeza cut for hay - - - -			tons 21
22. Redtop, millet, Sudan, orchard grass, old meadows, etc., cut for hay - - - -			tons 22
23. Red clover cut for seed - - - -			bu. 23
24. Alsike clover cut for seed - - -			bu. 24
25. Sweetclover cut for seed - - -			bu. 25
26. Timothy cut for seed - - - - -			bu. 26
27. Lespedeza cut for seed - - - -			lb. 27
28. Redtop cut for seed - - - - -			lb. 28
29. Acres of all land in this farm (include land rented from others)		× × × ×	29

FALL GRAINS SOWN

30. Acres of winter wheat sown and to be sown for all purposes this fall (1948)		acres 30
31. Acres of winter wheat sown for all purposes last fall (1947)		acres 31
32. Acres of winter rye sown and to be sown for all purposes this fall (1948)		acres 32
33. Acres of winter rye sown for all purposes last fall (1947) - - - - - - - -		acres 33

Name .... R. ....
(Township)
Post office .... State ....
County ....
(In which farm is located)

(PLEASE BE SURE TO ANSWER QUESTION No. 29)
16—53320-2

August 1948
Nebraska Department of Agriculture
Division of Agricultural Statistics

O. E. 2-8579 Nebr.
United States Department of Agriculture
Bureau of Agricultural Economics—Agricultural Estimates

Federal-State Crop Reporting Service—203 Post Office Building, Lincoln, Nebr.

NEBRASKA GENERAL SCHEDULE

Please mail this schedule by August 1. The enclosed envelope, needs no stamp. As this blank is used in all parts of Nebraska there are some questions asked which do not apply to your locality. Please read carefully the instructions on the other side.

Condition should be reported on the basis of 100 representing a normal condition. (See instructions 1 and 2 on other side.)

Note.—In answering item 32, report total amount fed to all milk cows yesterday, not pounds per milk cow.

Report only on such items as are grown in your locality.

Please return this schedule even if you can report for only one or two items

Winter wheat	Rye	Corn		Spring wheat	Oats	Barley		Flaxseed	All sorghums	Sugar beets for sugar	Potatoes				Beans, dry, edible		Soybeans

1948 ACREAGE AND PRODUCTION OF CROPS

[C. E. 2-8729]
"J"

Budget Bureau No. 40-R127.1.
Approval expires Dec. 31, 1949.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
AGRICULTURAL ESTIMATES
WASHINGTON, D.C.

Del., Md.,
W. Va.

1948 ACREAGE AND PRODUCTION OF CROPS

The information asked for on this schedule is needed in preparing final estimates of acreage and yield of crops in 1948, and in estimating winter grain sowings this fall. Please fill out this card on both sides and return it promptly to your mail box in the enclosed envelope which requires no postage. Your report will be kept confidential.

W.A.Callander
Chairman, Crop Reporting Board.

Report for crops grown on this farm in 1948	Acres planted	Acres harvested and to be harvested	Total quantity harvested and to be harvested
1. Buckwheat			bu.
2. Potatoes (early) for barvest before Sept. 1.			bu.
3. Potatoes (late) for harvest after Sept 1			bu.
4. Sweetpotatoes			bu.
5. Tobacco			lb.
6. Alfalfa cut for hay			tons
7. Clover and timothy, alone or mixed, cut for hay			tons
8. Lespedeza cut for hay			tons
9. All other hay cut			tons
10 Red clover cut for seed			bu.
11. Peas (green) for canning and freezing			lb.
12 Snap beans			lb. shelled
13. Tomatoes			bu.

	Trees of bearing age Number	Total production
14 Apples		bu.
15. Peaches		bu.

CORN
(If not yet barvested, show intended use)

	Acres	Production
16. Corn planted		X X X
17. Corn for grain		bu.
18. Corn cut for silage		tons
19. Corn cut to feed whole without husking		tons
20. Corn pastured and bogged down without busking		X X X
21. Corn abandoned (not harvested, not pastured)		X X X

Comments _____

(Other side for small grain crops)

16—68520-3

ACREAGE UTILIZATION AND ABANDONMENT, 1948
(Report for each grain crop grown on your farm this year)

Note.—Sum of acres shown in columns 2 to 7 should equal acres shown in column 1.

Del., Md., W. Va.

Report on the use made of the acreage of each crop listed below	Acres planted last fall or this spring (1)	Threshed or combined for grain (2)		Cut for hay (3)		Cut ripe to feed unthreshed (4)		Used only for pasture (5)		Plowed under for soil improvement only (6)		Abandoned (not harvested, not pastured) (7)	
	Acre	Acre	Bushels	Acre	Tons	Acre		Acre		Acre		Acre	
22. Winter wheat				X X X									
23. Rye				X X X									
24. Oats													
25. Barley													
26. Soybeans													
27. Cowpeas													

(Other side for corn, hay, etc.)

GRAIN SOWINGS THIS FALL (1948)

Del., Md., W. Va.

In reporting on items 22, 23, and 25 as you gave the acres of winter grains sown last fall, show below the acres sown or to be sown this fall for all purposes.

	Acres
28. Winter wheat sown and to be sown for all purposes this fall	
29. Rye sown and to be sown for all purposes this fall	
30. Barley sown and to be sown for all purposes this fall	
31. Acres of all land in this farm (include land rented from others)	

Report made by—

Name _____

P. O. address _____

County _____ State _____ R. _____

16—53520-2

APPENDIX D–4. SPECIMENS OF SCHEDULES

[C. E. 2-8320]

Budget Bureau No. 40-R010.2.
Approval Expires Jan. 31, 1950.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
AGRICULTURAL ESTIMATES
WASHINGTON, D. C.

[JANUARY 1948]

SPECIAL INQUIRY ON DISPOSITION OF LIVESTOCK DURING YEAR 1947

PLEASE WRITE PLAINLY YOUR NAME AND ADDRESS BELOW

Name _____

R. D. No. _____

Date _____

Post office _____

County _____

State _____

DEAR SIR:

The purpose of this inquiry is to assist the Department in estimating the disposition of livestock. Please fill out for your farm and return in the enclosed envelope, which requires no postage. If you receive more than one blank, please hand extra copy to a neighbor to fill out and send in.

Your cooperation will be greatly appreciated.

Respectfully,

W. F. Callander
Chairman, Crop Reporting Board.

CATTLE AND CALVES

1. Number of all cattle and calves on this farm now (Jan. 1, 1948) ____

2. Of the cattle on farm Jan. 1, 1948 (question 1), how many were cows and heifers 2 years old and over? Number ____

3. Of the cattle and calves on this farm Jan. 1, 1948 (question 1), how many are being fattened for market on grain or other concentrates? Number ____

4. Number of calves born in 1947 ____

5. Number of 1947 calves died (including calves killed at birth) on this farm in 1947 ____

6. Number of cattle died on this farm in ____

____ butchered on or for ____

HOGS

10. Number of all hogs (including pigs) on this farm now (Jan. 1, 1948) ____

11. Of this number, how many are sows and gilts farrowed or to be farrowed between Dec. 1, 1947, and June 1, 1948? Number ____

12. Number of spring pigs born in 1947 (all pigs born before June 1) ____

13. Number of fall pigs born in 1947 (all pigs born June 1 to Dec. 1) ____

14. Number of hogs and pigs died on this farm in 1947 ____

15. Number of hogs (150 lb. and over) butchered on or for this farm in 1947 ____

16. Number of pigs (under 150 pounds) butchered on or for this farm in 1947 ____

17. What percent of the meat from hogs and pigs butchered was sold? Pct. ____

SHEEP AND LAMBS

18. Number of all sheep and lambs on this farm now (Jan. 1, 1948) ____

19. Of the sheep and lambs on farm Jan. 1, 1948 (question 18), how many were ewes and ewe lambs being kept for breeding ewes? Number ____

20. Number of lambs born in 1947 ____

21. Number of 1947 lambs died on this farm in 1947 ____

22. Number of sheep died on this farm in 1947 ____

23. Number of lambs butchered on or for this farm in 1947 ____

24. Number of sheep butchered on or for this farm in 1947 ____

25. What percent of the meat from lambs and sheep butchered was sold? Percent ____

26. Total acres of all land now in this farm, ranch, or plantation ____

BACK OF QUESTIONNAIRE FOR COMMENTS

C. E. 2-6795 G

United States Department of Agriculture—Bureau of Agricultural Economics—Agricultural Estimates, Washington, D. C.

MARCH GENERAL SCHEDULE

March 1949

Please mail this schedule by March 1. The enclosed envelope needs no stamp.

Please return this schedule even if you can report for only one or two items

Corn		Oats		Barley		Sorghum grain		All hay		Milk production				Chickens and eggs (Report for your own farm or ranch)			Feed fed to your laying stock during the month of February
1	2	3	4	5	6	7	8	9	10	11	12			Laying flock			18
Total bushels of corn produced on this farm or ranch last year (1948)	Of the corn produced, how many bushels have been and will be sold?	Total bushels of oats produced on this farm or ranch last year (1948)	Of the oats produced, how many bushels have been and will be sold?	Total bushels of barley produced on this farm or ranch last year (1948)	Of the barley produced, how many bushels have been and will be sold?	Total bushels of sorghum grain produced on this farm or ranch last year (1948)	Of the sorghum grain produced, how many bushels have been and will be sold?	Total tons of hay harvested on this farm or ranch last year (1948)	Of the hay harvested, how many tons have been and will be sold?	Number of cows milked on your farm or ranch yesterday	Number of all milk cows on your farm yesterday (both dry and is milk)	Total production of milk on your farm or ranch yesterday (Report in either pounds or gallons)		15	16		
Bu. of 70 lb. in ear	Bu. of 70 lb. in ear	Bushels of 32 lb.	Bushels of 32 lb.	Bushels of 48 lb.	Bushels of 48 lb.	Bushels of 56 lb.	Bushels of 56 lb.	Tons of 2,000 lb.	Tons of 2,000 lb.	Number	Number	13 Pounds	14 Gallons	Number of hens (including pullets of laying age) in your flock yesterday	Number of eggs produced by your flock yesterday	Mash	All grains fed whole or cracked (including home-grown and commercial scratch grains)
														Number	Number	Pounds	Pounds

Budget Bureau No. 40–R099 1.
Approval expires December 31, 1950.

[C. E. 2–8465]

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
AGRICULTURAL ESTIMATES
WASHINGTON, D. C.

[JULY 1948]

SPECIAL INQUIRY ON WHEAT

DEAR SIR:
In order to assist in the important work of adjusting the estimates of production of wheat in 1947 and of preparing estimates of disposition and of income from this crop, will you kindly answer the questions below? Return this schedule in the enclosed envelope, **which requires no postage.**
Respectfully.

W. F. Callander
Chairman, Crop Reporting Board.

Reported by ....   R. D. No. ....

Post office ....   State ....

County (in which
farm is located) ....

If you are not a wheat grower but use wheat for feeding livestock, including poultry, please answer Questions 3(b) and 8.   In case the wheat was grown under share rent, include both the landlord's and tenant's share in answering all questions.

WHEAT (including Durum Wheat)

WHEAT SUPPLY ON THIS FARM

Production, 1947:
1. Wheat produced on this farm in 1947 – – – – – – – – – – – – – – – – – – – .... bushels.   (1)

Carried Over:
2. Old wheat on hand July 1, 1947, from crops of 1946 and previous years (include loan wheat from 1946 and previous crops carried over) – – – – – – – – – .... bushels.   (2)

Purchased:
3. (a) Wheat bought for seed in fall of 1947 or spring of 1948 – – – – – – – – – .... bushels.   (3a)

   (b) Whole, cracked, or crushed wheat bought for feed between July 1, 1947, and July 1, 1948 .... bushels.   (3b)

4.   **Total Supplies** (sum of items 1, 2, and 3) – –.– – – – – – .... bushels.   (4)

DISPOSITION OF ABOVE WHEAT SUPPLIES

Used for Seed:
5. Wheat used for seeding in the fall of 1947 – – – – – – – – – – – – – – – .... bushels.   (5)

6. Wheat used for seeding in the spring of 1948 – – – – – – – – – – – – .... bushels.   (6)

Ground for Human Food:
7. Wheat ground for flour or exchanged for flour between July 1, 1947, and July 1, 1948 – – – – .... bushels.   (7)

Fed:
8. Whole, cracked, or crushed wheat fed to poultry and livestock between July 1, 1947, and July 1, 1948 – – – – – – – – – – – – – .... bushels.   (8)

Sold:
9. Wheat sold between July 1, 1947, and July 1, 1948.   Include wheat paid as insurance premiums and wheat turned over to Commodity Credit Corporation. (Report wheat still under Government loan as item 11(a) or 11(b) below) – – – – – – – .... bushels.   (9)

Shrinkage and Waste:
10. Wheat lost through shrinkage, etc., during the year July 1, 1947, to July 1, 1948 – – – – – .... bushels.   (10)

On Hand July 1, 1948 (do not include any from the 1948 crop):
11. (a) Wheat stored **on this farm** on July 1, 1948:
       Still under Government loan – – – – – – – – – – – – – – .... bushels. (11a)
       Not under Government loan – – – – – – – – – **off this farm** on July 1, 1948: .... bushels. (11a)
    (b) Wheat stored in elevators, warehouses, etc., **off this farm** on July 1, 1948:
       Still under Government loan – – – – – – – – – – – – – – .... bushels. (11b)
       Not under Government loan – – – – – – – – – – – – – – .... bushels. (11b)

12.   **Total Disposition** (sum of items 5, 6, 7, 8, 9, 10, and 11) – .... bushels.   (12)

USE BACK OF SCHEDULE FOR COMMENTS

U. S. GOVERNMENT PRINTING OFFICE   16—64942-1

APPENDIX D-6. SPECIMENS OF SCHEDULES

[C. E. 2-8493]
"A"

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
AGRICULTURAL ESTIMATES
WASHINGTON 25, D. C.

Budget Bureau No. 40-R1766.
Approval expires Sept. 30, 1950.

[JUNE 1948]

UTILIZATION OF 1947 POTATO CROP AND ACREAGE FOR 1948

DEAR SIR:

We would appreciate approximate figures showing the disposition of the potatoes grown on your farm in 1947 and the acreage planted to potatoes in 1948. **Please return this inquiry as soon as possible, in the enclosed envelope, which requires no postage.**

Very truly yours,

W. F. Callander
Chairman, Crop Reporting Board.

Name _____ State _____

Post office _____ R. D. No. _____

County _____

PLEASE REPORT FOR THE FARM OR FARMS YOU OPERATE

ACREAGE AND PRODUCTION, 1947:

1. Total acres of potatoes harvested in 1947 - - - - - - - - - - - - - - _____ acres

2. Bushels harvested from entire acreage (potatoes actually hauled from field) - - - - - _____ bushels

DISPOSITION OF 1947 POTATO CROP:

3. In the following spaces, please report the **uses made** or **to be made** of the potatoes reported under item 2:

(a) Quantity **sold.** (Include all sales under Government price support programs) - _____ bushels

(b) Used for **food** (human consumption) on your farm - - - - - - - _____ bushels

(c) **Fed** to livestock and poultry on your farm. (Include only potatoes of your 1947 production for which no payment was received) - - _____ bushels

(d) Used for **seed** on your farm. (Do not include seed purchased) - - _____ bushels

(e) Lost through shrinkage, decay, or dumping. (Do not include any potatoes for which payments were received) - - - - - - - - _____ bushels

(f) **TOTAL** of items (a) through (e), which should equal item 2 - - - - _____ bushels

MONTH OF SALE:

4. Of the potatoes reported in item 3(a), about how many bushels have been or will be **sold** during:

1947	Bushels	1948	Bushels
June - - - - - - - - - _____		January - - - - - - _____	
July - - - - - - - - - _____		February - - - - - - _____	
August - - - - - - - _____		March - - - - - - - _____	
September - - - - - _____		April - - - - - - - _____	
October - - - - - - _____		May - - - - - - - _____	
November - - - - - _____		TOTAL SOLD - - - - _____	
December - - - - - _____		For sale after June 1 - - _____	

SEED PURCHASES AND ACREAGE PLANS, 1948:

5. Seed potatoes purchased for 1948 plantings - - - - - - - - - - - - - - _____ bushels

6. Potato acreage planted or to be planted in 1948 - - - - - - - - - - - - _____ acres

USE BACK OF INQUIRY FOR COMMENTS

U. S. GOVERNMENT PRINTING OFFICE   16—51808-2

[C. E. 6–38]
"A"

Budget Bureau No. 40–R015.1.
Approval expres July 31, 1950.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
AGRICULTURAL ESTIMATES
WASHINGTON, D. C.

[JANUARY 1949]

SPECIAL INQUIRY ON IRISH POTATOES

DEAR SIR:

We need your cooperation in determining the probable disposition of the 1948 Irish potato crop and **merchantable stocks** on hand January 1, 1949. Your answers to the questions below will be of great assistance to us. Please return this inquiry as soon as possible, since those received after January 10 cannot be used. **Enclose in the addressed envelope, which requires no postage.**

Very truly yours,

W. F. Callander
Chairman, Crop Reporting Board.

NOTE.—This inquiry refers to the crop commonly known as "Irish potatoes" in the South and "potatoes" in the North. Sweetpotatoes should **not** be included in answers to these questions

REPORT ON 1948 IRISH POTATO CROP FOR FARM OR FARMS OPERATED BY YOU

ACREAGE AND PRODUCTION, 1948:

1. Total acres of potatoes harvested in 1948 – .... acres

2. Bushels harvested from entire acreage (potatoes actually hauled from field) – – – – – – – – – .... bushels

PROBABLE DISPOSITION OF 1948 CROP:

In the spaces below report the **uses made and to be made** of the crop shown above (item 2):

3. **Marketed** (delivered sales) before January 1, 1949, for **all purposes,** including **all sales** to the Government under its price support program – – – – – – – – – – – – – – – – – – .... bushels

4. **Fed and to be fed to livestock** and poultry on your farm. (Include only potatoes of your 1948 production for which no payment was received.) – – – – – – – – – – – – – – – .... bushels

5. **Used and to be used for food** (human consumption) on your farm – – – – – – – – – – – .... bushels

6. Potatoes of your 1948 production **to be used as seed on the farm you will operate in 1949** – – .... bushels

7. **Harvested potatoes lost** through decay, dumping, etc., including potatoes **still on hand that are unfit for food or seed.** (Do not include any potatoes for which payment was received.) – – .... bushels

8. Potatoes of your own production **still on hand and available for marketing after January 1, 1949** – .... bushels

9. **Total** of items 3 through 8 (which should equal harvested crop shown for item 2) – – – – – – .... bushels

LOCATION OF MERCHANTABLE STOCKS:

10. Of the total quantity of your 1948 crop potatoes still on hand and available for marketing after January 1 (item 8), how many are stored:

(a) **On farms** (including your own or neighbor's farm) – – – – – – – – – – – – – .... bushels

(b) **Off farms** in storages operated by dealers or cooperatives and off-farm storages operated by you – .... bushels

YOUR PLANS FOR 1949 ACREAGE:

11. How much seed have you **bought,** or do you **expect to buy,** for planting in 1949? – – – – – .... bushels

12. How many acres of potatoes do you **expect to plant** for harvest in 1949? – – – – – – – – – .... acres

USE BACK OF INQUIRY FOR COMMENTS

Date ....

Name ....

R. D. No. ....

Post office ....

State ....

County (in which farm is located) ....

16—57394e–1   U. S. GOVERNMENT PRINTING OFFICE

APPENDIX D–8. SPECIMENS OF SCHEDULES

[C. E. 2-S290]
"N. A."

Budget Bureau No. 40-R134.
Approval expires January 31, 1948.

LIVESTOCK REPORT, DEC. 1, 1947

POST OFFICE DEPARTMENT IN COOPERATION WITH THE
UNITED STATES DEPARTMENT OF AGRICULTURE

Name _____ R. _____ _____
(Box)

Post office _____

_____ State _____

County _____

_____ (1)

1. ACRES OF ALL LAND IN THIS FARM

CATTLE AND CALVES ON THIS FARM NOW

Number

2. COWS and HEIFERS, two years old and older, kept for milk. (Include all milk cows whether now in milk or dry and all 2-year-old heifers which will be milked when fresh) _____ (2)

3. HEIFERS, one year old and under two, now being raised for milk cows _____ (3)

4. COWS and HEIFERS, two years old and older, not kept for milk. (Include beef cows, 2-year-old beef heifers, etc.) (Do not include any cows and heifers listed under Question 2) _____ (4)

5. HEIFERS, one year old and under two, intended for beef cows or for beef, not intended for milk cows. (Do not include any heifers listed under Question 3) _____ (5)

6. STEERS, one year old and over _____ (6)

7. BULLS, one year old and over _____ (7)

8. 1947 HEIFER CALVES on this farm NOW. (Do not include any animals reported under Questions 3 or 5) _____ (8)

9. 1947 BULL CALVES and STEER CALVES on this farm NOW _____ (9)

10. TOTAL OF ALL CATTLE AND CALVES OF ALL AGES ON THIS FARM NOW (about December 1, 1947). (Sum of items 2 to 9, inclusive) _____ (10)

11. COWS MILKED on this farm yesterday _____ (11)

12. ALL MILK COWS in this herd yesterday (both dry and in milk). (Do not include heifers not yet freshened) _____ (12)

13. Total production of MILK by this herd yesterday.
Report in either Pounds __ _____ (13)
or
Gallons __ _____

Number

14. PULLETS BEING KEPT FOR LAYERS on this farm NOW _____ (14)

15. HENS (do not include pullets) on this farm NOW _____ (15)

16. OTHER CHICKENS on this farm NOW _____ (16)

17. Total CHICKENS (sum of items 14, 15, and 16) _____ (17)

(See other side for report on Hogs, Sheep, Horses, and Mules)
16—53335-1

[C. E. 2-8290]
"N. A."

DEC. 1, 1947

HOGS AND PIGS ON THIS FARM NOW

Number

18. HOGS over six months old of all kinds _____ (18)

19. PIGS under six months old _____ (19)

20. HOGS and PIGS of all ages on this farm NOW (sum of items 18 and 19) _____ (20)

FALL FARROWING THIS YEAR, 1947

21. Number of SOWS which farrowed (gave birth to pigs) on this farm during the last six months (between June 1 and December 1, 1947) _____ (21)

22. Number of PIGS SAVED (pigs living December 1, or sold before December 1) from all litters farrowed on this farm during the last six months (June 1 to December 1, 1947) _____ (22)

SPRING FARROWING THE COMING YEAR, 1948

23. Number of SOWS which have been bred or will be bred to farrow on this farm between December 1, 1947, and June 1, 1948 _____ (23)

24. Of the SOWS which farrowed during the last six months (Question 21), how many farrowed in each of the following months?

June _____; July _____; Aug. _____;

Sept. _____; Oct. _____; Nov. _____ (24)

SHEEP AND LAMBS ON THIS FARM NOW

Number

25. EWES one year old and over _____ (25)

26. EWE LAMBS under one year _____ (26)

27. WETHER and RAM LAMBS under one year _____ (27)

28. WETHERS and RAMS one year old and over _____ (28)

29. Total SHEEP and LAMBS (sum of items 25 to 28, inclusive) _____ (29)

HORSES ON THIS FARM NOW

Number

30. HORSES two years old and over _____ (30)

31. COLTS one year old and under two _____ (31)

32. COLTS under one year _____ (32)

33. Total HORSES and COLTS (sum of items 30 to 32, inclusive) _____ (33)

MULES ON THIS FARM NOW

Number

34. MULES two years old and over _____ (34)

35. MULE COLTS one year old and under two _____ (35)

36. MULE COLTS under one year _____ (36)

37. Total MULES and MULE COLTS (sum of items 34 to 36, inclusive) _____ (37)

(See other side for report on Cattle and Poultry)

16—53335-1   U. S. GOVERNMENT PRINTING OFFICE

[C. E. 2–8323]

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
AGRICULTURAL ESTIMATES

Budget Bureau No. 40-R012.1.
Approval expires Sept. 30, 1949.

[JANUARY 1, 1948]

SPECIAL SHEEP INQUIRY

DEAR SIR:

The United States Department of Agriculture will again collect and furnish you with information on the **sheep industry.** This requires cooperation from owners of sheep. Will you kindly assist us by answering the questions below and return this form at once in the enclosed **postage-free envelope.** Your answers in this report **will be kept strictly confidential.**

Very truly yours,

_____ Agricultural Statistician.

NOTE.—Please report your own sheep and lambs, or those in which you are interested. If exact numbers are not known, give your best estimate. This report is for **STOCK SHEEP ONLY. DO NOT INCLUDE** sheep and lambs being fattened for market.

Number

1. **STOCK SHEEP** on your farm, ranch, or range, or in your outfit about January 1, 1948: _____

    (a) **AGED EWES,** say 6 years old and over - _____

    (b) **YOUNG EWES,** 2 to 5 years old - _____

    (c) **YEARLING EWES,** coming twos - _____

    (d) **EWE LAMBS,** coming yearlings held for breeding ewes - - - - - - - - - - - - - _____

    (e) **BUCKS and WETHERS,** 1 year old and over - - - - - - - - - - - - - - - _____

    (f) **BUCK and WETHER LAMBS** (Do not include lambs being fattened for market.) - - - _____

2. **TOTAL STOCK SHEEP and LAMBS ON HAND NOW** (Sum of numbers listed above.) - - _____

3. **TOTAL STOCK SHEEP and LAMBS** on hand a year ago (Jan. 1, 1947.) - - - - - - - - _____

4. **LAMBS RAISED** by your outfit in 1947 (Your docking count, less deaths and losses of lambs after docking. Do not include lambs bought.) - - - - - - - - - - - - - - - - - - _____

5. Numbers **BOUGHT** by you during 1947: **LAMBS** bought _____ **SHEEP** bought _____

6. Numbers **SOLD** by you during 1947: **LAMBS** sold _____ **SHEEP** sold _____

7. Number of **SHEEP LOST or DIED** from all causes during 1947 (Do not include losses of 1947 lambs.) - _____

8. Number of **LAMBS LOST or DIED** after docking to the end of the year 1947 - - - - - - - _____

9. Number of **SHEEP and LAMBS BUTCHERED** in 1947 for consumption on your ranch - - - - _____

10. Total number of **SHEEP SHORN** from your outfit during 1947 - - - - - - - - - Number _____

11. **TOTAL POUNDS of WOOL SHORN** from your sheep during 1947 - - - - - - - Pounds _____

12. **POUNDS** of **WOOL SOLD** from your 1947 clip - - - - - - - - - - - - - - Pounds _____

13. Average **PRICE PER POUND** received from the sale of your 1947 wool clip - - - - Cents _____

14. **MONTHS** in which 1947 **WOOL** was **SOLD:** _____
    (If contracted in advance of shearing, show month when contracted.)

15. What are the average **VALUES PER HEAD** in your locality about January 1, 1948:

    (a) Aged breeding ewes? - - - - $_____   (d) Ewe lambs, coming yearlings? - $_____

    (b) Young breeding ewes? - - - $_____   (e) Wether lambs? - - - - - - - $_____

    (c) Yearling breeding ewes, coming twos? - - - - - $_____   (f) Bucks of all ages? - - - - - $_____

    (Use back of this sheet.)

Your comments regarding the sheep industry will be appreciated.

Post Office _____

Name _____

State _____

County _____

U. S. GOVERNMENT PRINTING OFFICE: 1947 O - 794879

APPENDIX D-10. SPECIMENS OF SCHEDULES

[C. E. 2-8293]
SPEC. "W"

Budget Bureau No. 40-R134.
Approval expires January 31, 1948.

LIVESTOCK REPORT, DEC. 1, 1947

UNITED STATES DEPARTMENT OF AGRICULTURE

Name _____

Post office _____ R. _____ _____
(Box)

County _____ State _____

1. ACRES OF ALL LAND IN THIS FARM OR RANCH	_____ (1)

CATTLE AND CALVES ON THIS FARM OR RANCH NOW

Number

2. **COWS** and **HEIFERS**, two years old and older, kept for **milk**. (Include all milk cows whether now in milk or dry and all 2-year-old heifers which will be milked when fresh) _____ (2)

3. **HEIFERS**, one year old and under two, **now being raised for milk cows** _____ (3)

4. **COWS** and **HEIFERS**, two years old and older, not kept for milk. (Include beef cows, 2-year-old beef heifers, etc.) (**Do not** include any cows and heifers listed under Question 2) _____ (4)

5. **HEIFERS**, one year old and under two, intended for beef cows or for beef, not intended for milk cows. (**Do not** include any heifers listed under Question 3) _____ (5)

6. **STEERS**, one year old and over _____ (6)

7. **BULLS**, one year old and over _____ (7)

8. **1947 HEIFER CALVES** on this farm or ranch **NOW**. (**Do not** include any animals reported under Questions 3 or 5) _____ (8)

9. **1947 BULL CALVES** and **STEER CALVES** on this farm or ranch **NOW** _____ (9)

10. **TOTAL OF ALL CATTLE AND CALVES OF ALL AGES ON THIS FARM OR RANCH NOW** (about December 1, 1947). (Sum of items 2 to 9, inclusive) _____ (10)

11. **TOTAL OF ALL CATTLE AND CALVES OF ALL AGES ON YOUR FARM OR RANCH A YEAR AGO** _____ (11)

12. **COWS MILKED** on this farm or ranch yesterday _____ (12)

13. **ALL MILK COWS** in this herd yesterday (both dry and in milk). (**Do not** include heifers not yet freshened) _____ (13)

14. Total production of **MILK** by this herd yesterday. Report in either **Pounds__** _____
or
Gallons__ _____ (14)

15. **CALVES BORN** on this farm or ranch in 1947. (Include calves on hand and calves sold or died. **Do not** include calves bought) _____ (15)

16. **1947 CALVES BUTCHERED** during 1947 for ranch and home use and sale of farm butchered meat _____ (16)

17. **CATTLE** (not calves) **BUTCHERED** during 1947 for ranch and home use and sale of farm butchered meat _____ (17)

18. **1947 CALVES DIED** during 1947 (from disease, accident, predators, exposure, etc. Include dairy calves killed at birth) _____ (18)

19. **CATTLE** (not calves) **DIED** during 1947 (from disease, accident, predators, exposure, etc.) _____ (19)

(See other side for report on Horses and Mules)
16—53335–1

[C. E. 2-8293]
SPEC. "W"

DEC. 1, 1947

HORSES ON THIS FARM OR RANCH NOW

Number

20. **HORSES** two years old and over _____ (20)

21. **COLTS** one year old and under two _____ (21)

22. **COLTS** under one year _____ (22)

23. Total **HORSES** and **COLTS** (sum of items 20 to 22, inclusive) _____ (23)

MULES ON THIS FARM OR RANCH NOW

Number

24. **MULES** two years old and over _____ (24)

25. **MULE COLTS** one year old and under two _____ (25)

26. **MULE COLTS** under one year _____ (26)

27. Total **MULES** and **MULE COLTS** (sum of items 24 to 26, inclusive) _____ (27)

(See other side for report on Cattle)

U. S. GOVERNMENT PRINTING OFFICE 16—53335–1

Budget Bureau No. 40-R323.1
Approval Expires 12-31-48

SOUTH DAKOTA CROP AND LIVESTOCK REPORTING SERVICE
United States Department of Agriculture   South Dakota Department of Agriculture
Bureau of Agricultural Economics   Division of Agricultural Estimates
                    OFFICE OF THE AGRICULTURAL STATISTICIAN
           332 Paulton Building, Sioux Falls, South Dakota

RANGE AND LIVESTOCK INQUIRY, JULY 1, 1948

Dear Sir:

Will you please give us the benefit of your judgment on the condition of livestock and ranges in your section? Also, your comments on feed supplies and general livestock situation will be appreciated. Please fill out this blank and mail it in the enclosed postage free envelope to reach this office about July 1.

Very truly yours,

Samuel J. Gilbert

Samuel J. Gilbert
Agricultural Statistician

GUIDE: 100 percent and over represents an excellent condition such as might be expected when nearly all circumstances are favorable; 90-99 very good; 80-89 good; 70-79 fair; 60-69 poor; 50-59 bad; 49 and under very bad.

1. Condition of RANGES about July 1 . . . . _____ Percent

2. Condition of CATTLE & CALVES about July 1. . . . . _____ Percent

3. Condition of SHEEP & LAMBS about July 1. . . . . . _____ Percent

4. 1948 LAMB CROP -- About how many lambs were saved, docked or marked this year for each 100 ewes?. . . _____ Number

5. Average weight per fleece of wool shorn this year? . . . . _____ Pounds

Please comment on: Condition of summer ranges and pastures, prospects for fall ranges, insect damage, condition of cattle and sheep, moisture supply, stock water, development of the lamb crop.

_____

_____

_____

_____

_____

_____   _____   _____
        (Name)   (Post Office)   (County)

APPENDIX D–12. SPECIMENS OF SCHEDULES

United States Department of Agriculture—Bureau of Agricultural Economics—Agricultural Estimates—Washington, D. C.

JANUARY GENERAL SCHEDULE

January 1949

1. This enclosed envelope which comes under your personal observation, or with which you are familiar. Please read carefully the instructions on the other side.

of the country about you is a return this schedule even if you can report for only one or two items

Please mail this schedule about

needs no stamp. Report for t'

Name ....

Post office ....

C. E. 24766 G

Use cross (X)
Use dash (—)
Write in the
Use cipher (O)

16—59923—3

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS—AGRICULTURAL ESTIMATES
WASHINGTON, D. C.

APRIL GENERAL SCHEDULE

[APRIL 1949]

Budget Bureau No. 40–R007.1.
Approval expires Dec. 31, 1949.

This schedule should be mailed by you by April 1 in the enclosed return envelope, which requires no postage. Report ONLY on such crops named as are grown in your locality. Report for that part of the country about which you are familiar. Please read carefully the instructions on the other side before making your report.

Note.—In answering item 19, report total basis of 100 percent... amount fed to all milk cows...

RETURN THIS SCHEDULE EVEN THOUGH YOU CAN REPORT FOR ONLY ONE OR TWO ITEMS

[C. E. 2–8833]

[APRIL 1949]

PLEASE WRITE PL

X   "Failure"
O

Use cross (X) when crop is not grown at all or...
Write in the word "FAILURE" when information is not suffic...
Use cipher (O) only when zero or none is to indic...

THIS SCHEDULE SHOUL

Name ....

Post office ....

Budget Bureau No. 40-R071.1.
Approval expires Dec. 31, 1949.

[C. E. 9-152]

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
AGRICULTURAL ESTIMATES
WASHINGTON, D. C.

[FEBRUARY 1, 1949]

MILK PRODUCTION INQUIRY

DEAR SIR:

Answers to the questions below are being requested in order that farmers may be provided with better information that will help them to adjust milk production and dairy practices to changing conditions and prospects.

Please return this inquiry as soon as convenient, in the enclosed envelope, which requires no postage.

Very truly yours,

W. F. Callander
Chairman, Crop Reporting Board.

Name _____ R. D. No. _____

Post office _____ State _____

County _____

GENERAL INSTRUCTIONS: (1) In reporting on cows, do not include heifers that have not yet freshened. (2) In reporting on milk production, include all milk drawn, whether used on farm or sold, but do not include milk sucked by calves. (3) Report milk in either gallons, quarts, or pounds, as you find most convenient, but be careful to put answers in the proper columns. (4) Be sure to report "0" when that is the proper answer.

Please answer the first three questions, even though you have only one or two cows or your cows are all dry.

COWS AND MILK

1. Number of **cows milked** on your farm yesterday – – – – – – – – – _____ number

2. Number of **all milk cows** on your farm yesterday (both dry and in milk) – _____ number

Gallons or Quarts or Pounds

3. **Milk produced** on your farm yesterday – – – – – – – – – – – – – _____ _____ _____

4. Of the milk produced on your farm yesterday, how much was—
   (a) Sold by you directly to consumers, **at retail**? – – – – – – – – _____ _____ _____
   (b) Sold as **whole milk** to dealers, cooperatives, condenseries, cheese factories, etc., at **wholesale**? – – – – – – – – – – – – – _____ _____ _____
   (c) Skimmed or separated for **sale of cream**? – – – – – – – – – – _____ _____ _____
   (d) Used or to be used for **making butter** on your farm? – – – – – _____ _____ _____
   (e) Other **whole milk** used for **food or drink** by people on your farm? (Include milk from which the cream was used as food, but do **not** include milk from which the cream was used for butter) – – – – _____ _____ _____
   (f) **Whole milk** (unskimmed) **fed** to calves or other livestock on your farm? (Do **not** include milk sucked) – – – – – – – – – – – _____ _____ _____

NOTE.—Try to account for all milk produced.

5. How much **skim milk** or **buttermilk** was used for food (or drink) on your farm yesterday? (Do **not** include skim milk fed to livestock) – – – – – – gallons _____ or quarts _____

6. Number of people, including children of all ages, now on your farm. (Include not only your own family but also hired help, croppers, and tenants and their families unless they are securing milk elsewhere) – – – – – – – _____ number

FEED

7. How many pounds of **grain** (including mill feeds and concentrates) were fed yesterday to **all milk cows** on your farm? (Report **total** amount fed to all milk cows yesterday, not pounds per milk cow) – – – – – – – – _____ pounds

8. What is the **value per 100 pounds** of the grain (including mill feeds and concentrates) being fed to milk cows on your farm? (If feeding purchased grain, report the price paid; if feeding home-grown grain, report the price it would bring at your local market; if you are feeding a mixture of home-grown and purchased grains, give your best estimate of the average value per 100 pounds of the mixture) – – – – $_____ per 100 pounds

9. What is the **value per ton** of the **hay** being fed to milk cows on your farm? (If feeding purchased hay, report delivered cost; if feeding home-grown hay, estimate the price it would bring at your farm; if feeding both home-grown and purchased, give your best estimate of the average value)

   Give value only for type of hay being fed – – – – – – – – {Loose hay $_____ per ton
   {Baled hay $_____ per ton

10. Indicate **kind of hay** being fed to milk cows: (Alfalfa, clover, clover and timothy, soybean, cowpea, peanut, lespedeza, etc.) – – – – – – – – – – – – – – – – – – – _____

USE OTHER SIDE FOR COMMENTS

U. S. GOVERNMENT PRINTING OFFICE   16—50702-2

APPENDIX D–14. SPECIMENS OF SCHEDULES

UNITED STATES
DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

IN COOPERATION WITH

IDAHO
DEPARTMENT OF AGRICULTURE
BUREAU OF DAIRYING

REPORT OF DAIRY PRODUCTS

MONTH OF ....

INSTRUCTIONS

1. Fill out this report in duplicate by use of carbon paper or otherwise.
2. Report in section I total receipts of milk and cream at your factory or plant during the month, regardless of point of origin or usage.
3. Report in section II the quantities of dairy products manufactured in your factory or plant during the month. The quantities should be given in pounds or gallons, as indicated after the name of the product.
4. Report in section III total quantity of butterfat used in manufacturing dairy products reported in section II. This is especially important if the quantity is different than reported as received in section I.

5. Both copies of this report should be mailed in the enclosed official envelope, which requires no postage.
6. This schedule should be mailed not later than the 10th of the following month.

Section I.—TOTAL RECEIPTS AND VALUE DURING THE MONTH*	Quantity of milk	Total butterfat	Total dollars paid
A. Whole milk:			$
1. Purchased from farmers direct or through receiving stations	Lb.	Lb.	x x x x x x x x x x
2. Purchased or received from other plants	Lb.	Lb.	x x x x x x x x x x
3. Produced by your own herd	Lb.		
B. Cream:			Lb. $
1. Purchased from farmers direct or through receiving stations	x x x x x x x x x x		
2. Purchased or received as cream from other plants	x x x x x x x x x x	Lb.	x x x x x x x x x x

*Report total receipts of milk and cream. Include receipts from producers both in Idaho and other States.

Section II.—PRODUCTS MANUFACTURED (During the month)	Code	Amount manufactured
Item	001	
1. Creamery butter (include butter custom churned for others)		Lb.
ICE CREAM (Include amount used for novelties and specialties)	527	Gal.
2. Ice cream for wholesale or delivery to your own retail stores	627	Gal.
3. Ice cream for direct retail sale or consumption at this location	127	Gal.
4. Sherbet (do not include water ices)	227	Gal.
5. Ice milk	327	Gal.
6. Frozen custards (state butterfat content)	427	Gal.
7. Frosted or frozen malted milk	028	Gal.
8. Ice cream mix made (total)	128	Gal.
9. Ice cream mix sold or transferred	228	Gal.
10. All other mix made (total) (exclude water ices)	328	Gal.
11. All other mix sold or transferred (exclude water ices)		
CHEESE	003	Lb.
12. American Cheddar cheese (made from whole milk)	103	Lb.
13. Colby or washed curd cheese (made from whole milk)	006	Lb.
14. Swiss cheese (including block)	107	Lb.
15. Brick cheese	209	Lb.
16. Cream cheese (not less than 33 percent fat)	309	Lb.
17. Neufchatel cheese (20 to 32 percent fat)	010	Lb.
18. All other varieties of cheese (give name)	009	Lb.
19. Cottage cheese curd made in this plant		Lb.
20. Cottage cheese, creamed (4% to 19% fat. Include cheese from curd made in this plant (reported above) or from curd received from other plants)	109	
CONDENSED PRODUCTS	019	Lb.
21. Unsweetened condensed milk (plain condensed): Bulk goods—Skimmed		Lb.
22. Evaporated milk (unsweetened): Case goods—Unskimmed	013	Lb.
23. Condensed or evaporated buttermilk	021	Lb.
DRY PRODUCTS	324	Lb.
Nonfat dry milk solids: {Spray process	424	Lb.
24. For human consumption {Roller process	224	Lb.
25.	122	Lb.
26. Dry skim milk for animal feed	022	Lb.
27. Dry whey	011	Lb.
28. Dry buttermilk		
29. Dry casein		
OTHER DAIRY PRODUCTS MANUFACTURED (Give name and quantity)		

Section III.—PAYMENT TO IDAHO DAIRY INSPECTION ACCOUNT		
1. Pounds of butterfat received from Idaho producers for processing dairy products		Lb.
2. Amount of payment at the rate of .8 of one mill per pound of butterfat		$

If you did not operate this plant during the above month, give name and address of the firm which operated it ....

Date ....   Name of concern ....   State ....

Address: Street ....   Post Office ....

R. D. ....

Signature of authorized person ....

Position or title ....

[C. E. 9-61]

APPENDIX D–15. SPECIMENS OF SCHEDULES

Form No. C.E. 9-119

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics
Room 803, New Post Office Building
Chicago 7, Illinois

MONTHLY DAIRY PRODUCTS REPORT
April - 1949

Section I—Receipts of Milk and Cream and Total Dollars Paid

Items	Quantity 1/ Pounds	Butterfat test Percent	Quantity of butterfat Pounds	Total paid 2/ Dollars
1. Whole milk received from farmers or receiving stations and used for manufacturing in the plant....................				
2. Whole milk received from farmers and receiving stations and sold direct to consumers or sold or transferred to other plants as whole milk, fluid cream, or plastic cream..............				
3. Cream received from farmers or receiving stations and used for manufacturing in the plant.........................				

1/ Please do not include receipts from other dealers or other company owned plants.

2/ Total dollars paid should be reported F.O.B. plant or country receiving station whichever is the customary point for determining prices. If actual total is not available, please estimate.

Section II—Production of Manufactured Dairy Products—April, 1949

MANUFACTURED DAIRY PRODUCTS	CODE	PRODUCTION Pounds	MANUFACTURED DAIRY PRODUCTS	CODE	PRODUCTION Pounds
BUTTER			**DRY MILK PRODUCTS**		
1. Creamery Butter (include whey and custom churned butter)................	001		20. Nonfat Milk Solids (Spray dried)......	324	
CHEESE			21. Nonfat Milk Solids (Roller dried).....	424	
2. American Cheddar Cheese..............	003		22. Dry Whole Milk (Spray dried)........	023	
3. American type—part skim cheese.......	004		23. Dry Whole Milk (Roller dried)........	123	
4. Colby and Washed Curd Cheese........	103		24. Special Dry Milk Products (Name)....	322	
5. Jack, Monterey, Granular (Whole Milk).	303		25. Dry Whey	122	
6. Jack, Monterey, Granular (Part Skim)..	203		26. Dry Buttermilk	022	
7. Full Skim American, Jack, Monterey...	005		27. Dry Skim Milk for Animal Feed.......	224	
8. Swiss Cheese...(Estimate for April)	006		28. Wet Curd Casein....................	211	
9. Munster Cheese .. " " "	007		29. Dry Casein	011	
10. Brick Cheese .... " " "	107				Gallons
11. Limburger Cheese " " "	008		30. Ice Cream (Include ice cream used in novelties, specialties, combination, etc.).	027	
12. Cream Cheese (Not less than 33% fat)..	209		31. Milk Sherbets	127	
13. Neufchatel Cheese (20 to 32.9% fat)....	309		32. Other Frozen Dairy Foods............	527	
14. Italian Cheese—whole milk (Name)....	110		33. Other Dairy Products (Kind and unit).	333	
15. Italian Cheese—part-skim milk (Name).	310		....		
16. Italian Cheese—full-skim milk (Name)..	410		....		
17. Blue Mold Cheese (Roquefort type)....	210		....		
18. Cottage Cheese Curd made from Skim Milk	009		....		
19. Other varieties not listed above (Name).	010		....		

The above report should be completed and mailed not later than the 15th of May if at all possible, to the United States Department of Agriculture, Post Office Box 6910-A, Chicago, Illinois. The enclosed return envelope which requires no postage may be used in returning your report.

_____   _____   _____
(Signature of authorized official)   (Title)   (Date)

[C. E. 9–128]

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
WASHINGTON, D. C.

Budget Bureau No. 40–R473.4.
Approval expires April 30, 1948.

FLUID MILK CONSUMPTION INQUIRY
(Calendar year 1947)

This office is gathering information on the milk and cream used for fluid consumption in the United States. Please indicate below the approximate quantities of milk and cream for fluid use in your village, town, or city that reached the consumer through the various channels shown below.

If you are unable to answer the questions, please refer this inquiry to someone in your community who might be able to answer them.   An envelope which requires no postage is enclosed for the return of the inquiry after it has been completed.

Yours very truly,

W. F. Callander

Assistant Chief, Bureau of Agricultural Economics.

MILK (AND CREAM) USED FOR DIRECT HUMAN CONSUMPTION IN FLUID FORM IN THIS AREA DURING 1947*

	MILK Quarts per day	CREAM Quarts per day
1. **Delivered directly to consumers by farmers and producer-distributors** (include here bulk or bottled milk delivered to homes, restaurants, etc., by those who produce from their own herds most of the milk they sell) – – – – – – – –		
2. **Delivered or sold to consumers by milk dealer-distributors and stores** (include here bulk or bottled milk distributed for consumption by those who purchase all or most of the milk they sell) –		
3. **All other milk and cream used for direct human consumption** (include here a rough approximation of the milk from "family cows" and institutional herds) – –		
4. Total (sum of items 1, 2, and 3) – – – – – – – – – – – – – – – – – – –		
5. Average butterfat test of deliveries – – – – – – – – – – – – – Percent		
6. Approximate population of the area in which the above supply of milk and cream was sold –		

	INCREASE NUMBER	DECREASE NUMBER	UNCHANGED (Check here)
7. Change in population of the above area from July 1, 1946 to July 1, 1947 – – –			

8. Give rough description of area for which above population and sales were reported (i. e. village, town, city, or other area) – – – – – – – – – – – –

Estimates made by ....

*Exclude buttermilk, skim milk, and milk and cream used for making butter, ice cream, and other manufactured dairy products.

FOR INSTRUCTIONS SEE REVERSE SIDE

APPENDIX D–17. SPECIMENS OF SCHEDULES

[C. E. 2–8454]

Budget Bureau No. 40-R071.1-
Approval expires Dec. 31, 1949.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
AGRICULTURAL ESTIMATES
WASHINGTON, D. C.

[MAY 1, 1948]

MILK PRODUCTION INQUIRY

DEAR SIR:

Answers to the questions below are being requested in order that farmers may be provided with better information that will help them to adjust milk production and dairy practices to changing conditions and prospects.

Please return this inquiry as soon as convenient, in the enclosed envelope, which requires no postage.

Very truly yours,

W. F. Callander
Chairman, Crop Reporting Board.

Name _____   R. D. No. _____

Post office _____   County _____

State _____

GENERAL INSTRUCTIONS: (1) In reporting on cows, do **not** include heifers that have not yet freshened. (2) In reporting on milk production, include all milk drawn, whether used on farm or sold, but do not include milk sucked by calves. (3) Report milk in either gallons, quarts, or pounds, as you find most convenient, but be careful to put answers in the proper columns. (4) Be sure to report "0" when that is the proper answer.

Please answer the first three questions, even though you have only one or two cows or your cows are all dry.

COWS AND MILK

	Gallons	or Quarts	or Pounds
1. Number of **cows milked** on your farm yesterday _____ number			
2. Number of **all milk cows** on your farm yesterday (both dry and in milk) _____ number			
3. **Milk produced** on your farm yesterday			

FEED

4. How many pounds of **grain** (including millfeeds and concentrates) were fed yesterday to all milk cows on your farm? (Report **total** amount fed to all milk cows yesterday, not pounds per milk cow) _____ pounds

5. Show below the approximate number of **pounds** of each kind of **grain** (including millfeeds and concentrates) fed yesterday to **all milk cows** on your farm:

	Pounds Fed Yesterday Home-grown	Purchased	(Continued)	Pounds Fed Yesterday Home-grown	Purchased
Corn, whole or ground			Gluten feed or gluten meal	x x x x	
Oats, whole or ground			Wheat bran, shorts, or middlings	x x x x	
Barley, whole or ground			Linseed meal	x x x x	
Wheat, whole or ground			Commercial mixed feed	x x x x	
Soybeans or soybean meal			Other grains and concentrates:		
Cottonseed meal or cottonseed cake	x x x x		(give kind _____)		
Cottonseed					

6. What is the **value per 100 pounds** of the grain (including millfeeds and concentrates) being fed to milk cows on your farm? (If feeding purchased grain, report the price paid; if feeding home-grown grain, report the price it would bring at your local market; if you are feeding a mixture of home-grown and purchased grains, give your best estimate of the average value per 100 pounds of the mixture) _____ $ _____ per 100 pounds

7. What percentage of the **feed** of milk cows is now being secured **from pastures?** _____ percent (Include with pastures winter grains or other crops being grazed by milk cows)

8. Show below the tons of each kind of **hay** and other **roughage** fed to milk cows on your farm during the October–May winter feeding season:

	FED TO MILK COWS October–May Period Home-grown (Tons)	Purchased (Tons)
HAY: Alfalfa hay		
Clover, mixed clover or lespedeza hay		
Soybean, cowpea, or peanut hay		
Other hay (give kind _____)		
SILAGE: (give kind _____)		
OTHER DRY ROUGHAGE: (fodder, bundle feed, straw, cottonseed hulls, etc., give kind _____)		

USE OTHER SIDE FOR COMMENTS

U. S. GOVERNMENT PRINTING OFFICE   16—51666-2

APPENDIX D–18. SPECIMENS OF SCHEDULES

ANNUAL REPORT OF DAIRY

INSTRUCTIONS

Item No.	MANUFACTURED PRODUCTS	Code No.	JANUARY	FEBRUARY	MARCH	APRIL	MAY
1	Butter (Include butter custom churned for others) ....Lbs..	001					
	Ice Cream, Ice Cream Mix, etc.						
2	Ice cream for wholesale or delivery to your own retail stores. Gals.. (Include amount used for novelties and specialties)	527					
3	Ice cream for direct retail sale or consumption at this location. Gals..	627					
4	Sherbet (exclude water ices)........................Gals..	127					
5	Ice milk...Gals..	227					
6	Frozen custards (state butterfat content)..........Gals..	327					
7	Frosted or frozen malted milk.....................Gals..	427					
8	Ice cream mix made (Total)........................Gals..	028					
9	All other mix made (Total) (exclude water ices)...Gals..	228					
	Cheese	003					
10	American Cheddar cheese (from whole or stand'dized milk).Lbs..	103					
11	Colby or washed curd cheese (from whole or standardized milk).Lbs..	004					
12	American type part-skim cheese....................Lbs..	005					
13	American type full-skim cheese....................Lbs..	006					
14	Swiss cheese, including block.....................Lbs..	007					
15	Münster cheese....................................Lbs..	107					
16	Brick cheese......................................Lbs..	008					
17	Limburger cheese..................................Lbs..	110					
18	Italian varieties of cheese (name and list varieties separately).Lbs..	110					
19	Italian varieties of cheese.......................Lbs..	209					
20	Cream cheese (not less than 33 percent fat).......Lbs..	309					
21	Neufchatel cheese (20 to 32 percent fat)..........Lbs..	210					
22	Blue mold cheese (roquefort type).................Lbs..	010					
23	All other varieties of cheese (give name).........Lbs..	009					
24	Cottage cheese curd made in this plant.........Lbs..	109					
25	Cottage cheese, creamed (4% to 19% fat. Incl. cheese from curd made in this plant (rpt'd above) or from curd rec'd from other plants).Lbs..	014					
	Condensed Products						
	Sweetened condensed milk:						
26	Case goods Skimmed..............................Lbs..	012					
27	Case goods Whole................................Lbs..	018					
28	*Bulk goods Skimmed.............................Lbs..	016					
29	*Bulk goods Whole...............................Lbs..	019					
	Unsweetened condensed milk (plain condensed):						
30	*Bulk goods Skimmed.............................Lbs..	017					
31	Evaporated milk (unsweetened): Whole...........Lbs..	015					
32	Case goods Skimmed..............................Lbs..	013					
33	Case goods Whole................................Lbs..	029					
34	Concentrated skim milk (for animal feed)..........Lbs..	021					
35	Condensed or evaporated buttermilk................Lbs..	324					
	Dry Milk Products						
36	Nonfat dry milk solids Spray process............Lbs..	424					
37	Roller process...........Lbs..	224					
38	Dry skim milk for animal feed.....................Lbs..	023					
39	Dry whole milk (unsweetened)......................Lbs..	123					
40	Dry cream...Lbs..	122					
41	Dry whey..Lbs..	022					
42	Dry buttermilk....................................Lbs..	011					
43	Dry casein..Lbs..	025					
44	Malted milk powder................................Lbs..	026					
45	Milk sugar (crude)................................Lbs..						

Other Dairy Products Manufactured (Give name and quantity)

| 46 | .... |
| 47 | .... |

†See instructions on reverse side.   *Do not include bulk goods eventually canned at this or any other plant.

If you (name of plant and address as shown on back) did not operate this plant during these months, give below th_____ Po_____

Name of concern ....

Date ....

(C. E. 9–83)

APPENDIX D–19. SPECIMENS OF SCHEDULES

TO WISCONSIN DAIRY PLANTS:

This schedule is sent for your report of dairy receipts and manufactures during 1948. It furnishes the data required under Wisconsin laws and also data required by the United States Department of Agriculture.

A separate report is required for each plant. If you do not have enough schedules for all of your plants, we will send you more.

Use the enclosed envelope, which requires no postage. Some special instructions concerning the handling of specific items on this schedule are given below. Please read instructions carefully before making your report.

Your prompt return of this schedule will be appreciated. It is required under the Wisconsin Law, Section 93.07 Wisconsin Statutes, and must be made to the State Department of Agriculture by all licensed dairy plants in Wisconsin. Under present conditions the need for this important information is great. The earlier we can have these reports, the more quickly the information for this State and for your country can be made available. Individual reports are kept confidential.

Yours very truly,

WALTER H. EBLING,
Agricultural Statistician.

INSTRUCTIONS FOR MAKING REPORT ON PRODUCTION OF DAIRY PRODUCTS

(Notes of explanation as these sometimes manufactured are listed below with the same numbers at the items to which the explanation refers)

Items 16 and 17. Milk and cream sold at retail.—Report under these questions quantities of whole milk or cream sold at retail—bottled milk or cream, bulk milk or cream to hotels, restaurants, bakeries, soda fountains, confectioners, etc., and whole milk used in flavored or other processed milk drinks.

Items 36 and 37. Condensed whole milk (sweetened) in case and in bulk refers to the product made from whole milk, known in Wisconsin as sweetened, condensed, evaporated, or sweetened concentrated milk. Include in your report all concentrated milk received from concentrating stations or other plants which is canned at your plant.

Items 39 and 41. Unsweetened condensed milk, Item 39, and evaporated whole milk (not sweetened) densed, evaporated, in bulk refer to the product made from whole milk and known in Wisconsin as concentrated milk (unsweetened).

Item 39. Unsweetened condensed milk, bulk, unskimmed, which is sold or transported to other plants for canning should not be included in your report. Item 39 should cover only the bulk product not canned and intended for use in bulk form.

Item 41. Include all concentrated milk received from concentrating stations or other plants which is canned at your plant.

Item 38 and 40. Condensed skim milk (sweetened and condensed) in bulk, refer to the same products made from skim milk as are mentioned for whole milk in Items 37 and 39. Include in your report all concentrated milk received from concentrating stations or other plants and canned or handled in bulk at your plant. If you have manufactured condensery products which are not shown in this report, state kind and amount under "Other Dairy Products Manufactured."

GENERAL NOTES

A. This schedule is to be used for reporting the amount of milk and dairy products received, sold, or manufactured in your factory or plant.

B. Name and address.—The name and address given at the top of the schedule is the way it appears in the records. If this is incorrect for any reason, such as change of ownership or management, please show the necessary corrections.

C. Plant not in operation.—Report for any period that the plant did operate.—If the plant, factory, or establishment was not in operation during the period covered by this schedule, state this fact and return schedule promptly. This will prevent unnecessary correspondence in making further requests for this information.

If the plant is closed only temporarily, give approximate date when it will reopen; also name and address of new owner or operator, if there is to be a change.

If the plant is closed permanently, please state this fact.

Please return this schedule promptly. Use the enclosed envelope which requires no postage.

D. Yearly totals.—When only yearly totals are available, please indicate by a check (✓) the months in which the products were produced.

E. Condenseries.—Note supplemental schedule (following this on opposite page.

ATTENTION—CONDENSERIES ONLY

Report below any bulk evaporated (or "concentrated") unskimmed milk shipped elsewhere for canning.

Name and address of plant to which shipped:

                              Pounds shipped in 1948.

(a) ....

(b) ....

(c) ....

How much bulk concentrated skim milk was shipped for canning purposes? ....

Report below any bulk evaporated (or "concentrated") unskimmed milk received from other plants for canning.

Name and address of plant from which received:

                              Pounds received in 1948.

(a) ....

(b) ....

(c) ....

How much bulk concentrated skim milk was received for canning purposes? ....

Budget Bureau No. 40-R037.2.
Approval expires March 31, 1951.

[C. E. 9-111]

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
WASHINGTON, D. C.

1948 ICE CREAM REPORT

Gentlemen:

The Bureau of Agricultural Economics is now preparing to issue its annual report of dairy products manufactured in 1948 by months and by States. The figures in this report will be based upon information received from manufacturers and producers. It will include data on the production of all leading dairy products, among which is ice cream. In order that the report may be of the greatest value to those interested in the ice cream industry, we are making intensive efforts to obtain and include complete information on the production of every ice cream manufacturer or producer.

We understand that during a part or all of 1948 your company was engaged in the making of ice cream. Any summary for your State that does not include the quantity of ice cream which you produced would be incomplete. We are therefore asking you to enter below, in the space provided, your production of ice cream and other dairy products in 1948. If you had no production in 1948, please return this schedule with a statement to that effect.

In order to meet the demand for information concerning the method of sale of ice cream, the question on the production of ice cream is divided as follows: (1) Ice cream frozen for direct retail sale or consumption at this location and (2) Ice cream frozen for wholesale or for delivery to your own retail stores. We shall appreciate your cooperation in filling out these two questions in full.

Please return your report in the enclosed envelope, which requires no postage. *Your report will be held strictly confidential.*

Sincerely yours, *W. F. Callander*

Assistant Chief, Bureau of Agricultural Economics.

PRODUCTS MADE IN 1948	Amount made in 1948
1. Ice cream frozen for direct retail sale or consumption at this location*	gals.
2. Ice cream frozen for wholesale or delivery to your own retail stores*	gals.
3. Sherbet (exclude water ices)	gals.
4. Ice milk	gals.
5. Frozen custards	gals.
6. Frosted or frozen malted milk	gals.
7. Other dairy products (give name)	gals.

Ice Cream Mix

8. Ice cream mix used in making ice cream in 1948	gals. mix
9. Of the quantity reported in item 8	
a. How many gallons of mix did you purchase?	gals. mix
b. How many gallons of mix did you manufacture?	gals. mix

*Do not include ice cream purchased from other ice cream producers.

18—80160–3   U. S. GOVERNMENT PRINTING OFFICE

APPENDIX D–22. SPECIMENS OF SCHEDULES

Budget Bureau No. 40-R 1464.1
Approval expires Sept. 30, 1948

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics
Chicago 80, Illinois

This Schedule
Should be mailed
by Friday night

WEEKLY REPORT OF CREAMERY BUTTER PRODUCTION AND MILK USED FOR
AMERICAN CHEESE PRODUCTION

_____ lbs. Butter

BUTTER:
Butter made at this plant during the week (7 days) ending Thursday, Jan. 8, 1948

CHEESE:
Total quantity of MILK (whole or standardized) USED in making AMERICAN _____ lbs. Milk
CHEESE (Colby, Cheddar, and Washed Curd) at this plant during the week (7
days) ending Thursday, Jan. 8, 1948

_____
(Signature of person making report)

_____
(Date)

Explain any extreme change in production this week from the previous week.

Slavik Ptg. Co., Chicago, 9-24-47

(Over)

CEX-244

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805 New Post Office Building
Chicago 80, Illinois

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics

Budget Bureau No. 40-R 319
Approval expires December 31, 1947

WEEKLY COLD STORAGE WAREHOUSE REPORT OF AMERICAN CHEESE STOCKS

This schedule should be mailed by Friday evening in the accompanying postage-free envelope.
AMERICAN OR CHEDDAR CHEESE

Close of this week.......... _____
(Date)

_____ Pounds

(Use your regular cut-off day for close of week)

CEX-306

_____
(Person making Report)

ICE CREAM PRODUCTION REPORT
December 1947

Budget Bureau No. 40-R-1512.1
Approval expires Jan. 31, 1948

SEE REVERSE SIDE FOR DETAILED INSTRUCTIONS

.U. S. DEPT. OF AGRICULTURE
Bureau of Agricultural Economics
Room 803, New P. O. Bldg.
Chicago, Illinois

Please mail by the 10th of Jan., 1948. Use the accom-
panying addressed postage-free return envelope.

Change address below, if incorrect.

ICE CREAM MADE AT THIS PLANT _____ gals.

1. ICE CREAM made in Dec., 1947 _____

2. Total BUTTERFAT in ice cream _____ lbs.
made in December, 1947

SHERBET MADE AT THIS PLANT

3. Milk SHERBET made in _____ gals.
December, 1947

Signature_____

Date_____

Title_____
Slavik Printing Co., Chicago 10-22-47—15M

(Over)

CEX-339

Budget Bur. No. 40–R 319.
Approval Exp. Dec. 31, 1947
805 New Post Office Bldg.
Tel: Wabash 9207

This report should
be mailed
Friday evening

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics
Chicago 80, Illinois

WEEKLY REPORT OF RECEIPTS AND STOCKS OF AMERICAN CHEESE

Mail this report promptly each Friday evening to Agricultural Statistician, Post Office Box 6910–A
Chicago 80, Illinois, using the official addressed envelope provided, which requires no postage.

Receipts should be reported as direct from other factories or PRODUCED IN THIS PLANT, and from
other branches or dealers or from cold storage warehouses. Stocks on hand should include all
stocks, sold or unsold, in your own warehouse, or in private rooms in public warehouses. Please
distinguish clearly all stocks on hand.

Styles of American Cheese	Receipts of American Cheese from factories during the week*	Receipts from other branches or dealers, or from cold storage warehouses during the week	Stocks on hand at close of business, Friday	
			Current trading stocks	Held stocks in private storage
				_____ boxes
		_____ boxes	_____ boxes	_____ boxes
FLATS....................	_____ boxes	_____ boxes	_____ boxes	_____ boxes
TWINS....................	_____ boxes	_____ boxes	_____ boxes	_____ boxes
CHEDDARS.................	_____ boxes	_____ boxes	_____ boxes	_____ boxes
80–LB. BLOCKS............	_____ boxes	_____ boxes	_____ boxes	_____ boxes
SINGLE DAISIES...........	_____ boxes	_____ boxes	_____ boxes	_____ boxes
TRIPLE DAISIES (TRIPLETS).	_____ boxes	_____ boxes	_____ boxes	_____ boxes
YOUNG AMERICAS...........	_____ boxes	_____ boxes	_____ boxes	_____ boxes
LONGHORNS................	_____ boxes	_____ boxes	_____ boxes	_____ boxes
SQUARE PRINTS (2 to box)..	_____ boxes	_____ boxes	_____ boxes	_____ boxes
JUNIOR TWINS (2 to box)...	_____ boxes	_____ boxes	_____ boxes	_____ boxes
2–LB. LOAF (Natural)(12 to box)	_____ boxes	_____ boxes	_____ boxes	_____ boxes
5–LB. LOAF (Natural)(Boxes of 20 lbs.)	_____ boxes	_____ boxes	_____ boxes	_____ boxes
PROCESS LOAF (Am)(30–Bundles)	_____ bundles	_____ bundles	_____ bundles	_____ bundles
MAMMOTHS (Report here all 100, 150, 300#, or other mammoth sizes separately)	No._____ Wt._____ No._____ Wt._____ No._____ Wt._____	No._____ Wt._____ No._____ Wt._____ No._____ Wt._____	No._____ Wt._____ No._____ Wt._____ No._____ Wt._____	No._____ Wt._____ No._____ Wt._____ No._____ Wt._____

*INCLUDE AMERICAN CHEESE PRODUCED AT THIS PLANT in this week's "receipts from factories"

Number of factories represented in this week's "receipts from factories"

REMARKS: If this report covers more than one assembling warehouse, show names and location below,
Please add any necessary explanation of above report or comments on market and produc-
tion conditions.

Date _____

Signed by _____

APPENDIX D–24. SPECIMENS OF SCHEDULES

This report should
be mailed
Friday evening

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics
803 New Post Office Bldg.
Chicago 7, Illinois

Budget Bureau Number
40-R 1580
App. Exp. Jan. 31, 1949
Tel: Wabash 9207

WEEKLY REPORT OF AMERICAN CHEESE RECEIPTS

Please mail this report promptly each Friday evening to Agricultural Statistician, Post Office Box 6910-A, Chicago 80, Illinois, using the official addressed envelope provided, which requires no postage. Receipts should include all American cheese received directly from other factories.

American Cheese produced in this plant or received from other plants
For the week ending

Styles	American cheese produced in this plant Quantity	American cheese received from other plants 1/ Quantity
	_____ boxes	_____ boxes
Flats....................................	_____ boxes	_____ boxes
Twins....................................	_____ boxes	_____ boxes
Cheddars.................................	_____ boxes	_____ boxes
80-lb. Blocks............................	_____ boxes	_____ boxes
Single Daisies...........................	_____ boxes	_____ boxes
Triple Daisies (Triplets)...............	_____ boxes	_____ boxes
Young Americas...........................	_____ boxes	_____ boxes
Longhorns................................	_____ boxes	_____ boxes
Square Prints (2 to box)..............	_____ boxes	_____ boxes
Junior Twins (2 to box)..............	_____ boxes	_____ boxes
2-lb. Loaf (Natural) (12 to box)......	_____ boxes	_____ boxes
5-lb. Loaf (Natural) (Boxes of 20 lbs)	_____ boxes	_____ bundles
Process Loaf (Am.) (30-Bundles).......	_____ bundles	
Mammoths (Report here all 100, 150, 300# or other mammoth sizes separately)	No. ____ Wt. ____ No. ____ Wt. ____	No. ____ Wt. ____ No. ____ Wt. ____

1/Number of factories represented in this week's "American Cheese received from other plants" _____

REMARKS: Please add any necessary explanation of above report or comments in market and production conditions.

Date _____

Signed by _____

CSX 309-A

APPENDIX D–25. SPECIMENS OF SCHEDULES

Budget Bureau No. 40-E-116-1
Approval Expires: Jan. 31, 1948

CEL-305

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics
Chicago 80, Illinois

803 New Post Office Bldg.
Tel: Wab. 9207

> This report should
> be mailed
> Friday evening

WEEKLY COLD STORAGE REPORT
For the week ending with the close of business, Friday

This report should be mailed each Friday evening to the Chicago office of the U. S. Department of Agriculture, Bureau of Agricultural Economics. Use the official addressed envelope provided, which requires no postage.

STYLES AMERICAN CHEDDAR CHEESE	Received during week	Delivered during week	On hand close of business, Friday
		_____ boxes	_____ boxes
Flats...........................	_____ boxes	_____ boxes	_____ boxes
Twins..........................	_____ boxes	_____ boxes	_____ boxes
Cheddars.......................	_____ boxes	_____ boxes	_____ boxes
80-lb. Blocks..................	_____ boxes	_____ boxes	_____ boxes
Single Daisies.................	_____ boxes	_____ boxes	_____ boxes
Young Americas.................	_____ boxes	_____ boxes	_____ boxes
Longhorns......................	_____ boxes	_____ boxes	_____ boxes
Square Prints (2 to box).......	_____ boxes	_____ boxes	_____ boxes
Junior Twins (2 to box)........	_____ boxes	_____ boxes	_____ boxes
5-lb. Loaf (Natural)(Bxs.of 20lbs)	_____ boxes	_____ boxes	_____ boxes
Process Loaf (Am.)(30 lb. Bundles)	_____ bundles	_____ bundles	_____ bundles
Mammoths......................	(No_____ Wt_____ (No_____ Wt_____	No_____ Wt_____ No_____ Wt_____	No_____ Wt_____ No_____ Wt_____
	RECEIVED	DELIVERED	ON HAND
Butter.................... Pounds			
Eggs (30-Dozen Cases)..... No.			
Dressed Poultry........... Pounds			
Frozen Eggs............... Pounds			

Date _____

Signed By _____

APPENDIX D–26. SPECIMENS OF SCHEDULES

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics
Chicago 80, Illinois

Budget Bureau No. 4G–R 622.2
Approval expires March 31, 1948

DRIED SKIM MILK REPORT FOR THE MONTH BEGINNING NOV. 26, 1947
AND ENDING DECEMBER 25, 1947

> Please Mail Not
> Later Than
> DEC. 27, 1947

To Dried Skim Milk Manufacturers:

The information asked for below is needed by the Department of Agriculture
for the proper administration of its various purchasing and production programs.
You are earnestly requested to cooperate by answering fully each question asked,
whenever applicable to your operations, and forward the completed form to U. S.
Bureau of Agricultural Economics, Box 6910–A, New Post Office Building, Chicago 80,
Illinois. An official addressed envelope, which does not require postage, is en-
closed for that purpose.

CARLOT SALES AND PRICES MONTH ENDING DECEMBER 25, 1947
EDIBLE DRIED SKIM MILK (HUMAN CONSUMPTION) F.O.B. FACTORY

Manufacturer's Carlot Sales to:	SPRAY PROCESS		ROLLER PROCESS	
	Quantity Sold	Average Net Price 1/	Quantity Sold	Average Net Price 1/
	Pounds	¢ per lb.	Pounds	¢ per lb.
Governmental Agencies				
Wholesalers				
Direct Users.				
Others.				
TOTAL SALES				

1/ To determine NET price f.o.b. factory, deduct freight paid by manufacturer and/
or discounts to wholesalers.

_____   _____
(Name of Company)   (Signature of Authorized Official)

                                   _____
                                   (Title)
_____
(Date)

APPENDIX D-27. SPECIMENS OF SCHEDULES

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
WASHINGTON 25, D. C.

Budget Bur. No. 40-R068.2
App. Exp. Jan. 31, 1951

MONTHLY DRY CASEIN SCHEDULE
FOR APRIL 1949
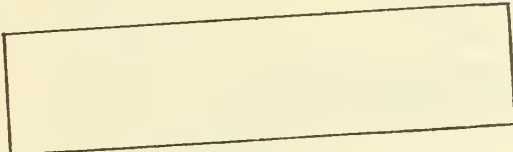
To Casein Manufacturers:

The information called for by this inquiry is to be used in making estimates of dry casein production and stocks for public distribution. It should be FILLED IN AND RETURNED NOT LATER THAN MAY 12. An addressed envelope which does not require postage is enclosed for its return. All of the data reported for individual plants or concerns will be held confidential and summarized totals only will be used.

W. F. Callander
Assistant Chief

DRY CASEIN PRODUCTION AND STOCKS

PRODUCTION:
Please enter in the first column below the total quantities of casein produced at this plant during April. Include casein dried for sale to grinders, brokers, users, or for transfer to other company plants for grinding, blending, or other purposes. Include casein dried from wet curd produced in this plant or bought or transferred from other plants. Do not include dry casein received from other plants for grinding, blending, etc.

STOCKS:
Please enter in second column all stocks of dry casein owned by this plant whether stored there or elsewhere, whether manufactured there or purchased from others (including imports), whether in storage or in transit (unsold) for storage, and whether sold or contracted for sale but not delivered.

PRODUCTION		STOCKS	
Period	Amount dried for sale to brokers, etc. or transfer to other company plants Pounds	Date	Quantity Pounds
April 1949		April 30, 1949	

_____
(Name of person signing)

_____
(Name of firm)

_____
(Title)

APPENDIX D–28. SPECIMENS OF SCHEDULES

Budget Bureau No. 40-R871.3
Approval expires Jan. 15, 1951

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
WASHINGTON 25, D. C.

MONTHLY MILK SUGAR REPORT
_____ 1949

Please report below data requested on the production, deliveries, and stocks of
milk sugar for your company. The data obtained will be published in summary form.
All individual reports will be confidential and will not be used so as to disclose
company operations.

Two copies of this form are enclosed. One completed copy is to be returned, and
the second copy is for your files. An addressed postage-free envelope is enclosed
for use in submitting completed report. Please mail the report by the 15th of the
month.

		GRADE	
			REFINED
Items	Crude 1/	Technical	U. S. P.
	Pounds	Pounds	Pounds
1. (a) Milk sugar made directly from whey during_____ 1949.			
(b) Milk sugar made from purchased crude sugar during_____ 1949.	xxxxxxxxx		
2. Milk sugar shipped (or delivered) in _____ 1949.			
3. Total stocks of milk sugar on hand at plant end of_____ 1949.			

1/ Report production and stocks of crude milk sugar concentrate in terms of its
dry weight equivalent on basis of 98 percent lactose.

_____
(Signature of authorized official)

_____
(Title)

_____
(Date)

APPENDIX D–29. SPECIMENS OF SCHEDULES

APPENDIX D–30. SPECIMENS OF SCHEDULES

[C. E. 9–140]

Budget Bureau No. 40–R024.9.
Approval expires April 30, 1951.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
WASHINGTON 25, D. C.

MANUFACTURER'S FIRM REPORT OF DRY MILK
JANUARY 1949

Your cooperation in filling out this form and returning it to the United States Department of Agriculture is requested. If at all possible please mail by the 15th of February, but if that cannot be done, mail not later than February 21. Individual reports will be considered as confidential and will not be used in such a way as to disclose company operations. Two copies of this form are supplied. One copy, on completion, is to be returned to the Department in the accompanying official envelope which does not require postage; the second copy is for your own files.

PRODUCTION, SHIPMENTS, PRICES, AND STOCKS OF DRY MILK PRODUCTS, JANUARY 1949

I. NONFAT DRY MILK PRODUCTS

TYPE OF PRODUCT	PRODUCTION Pounds	SHIPMENTS (Including L. C. L. and truck deliveries) Pounds	AVERAGE PRICE F. O. B. FACTORY Cents per pound	STOCKS ON HAND JANUARY 31, 1949 Pounds
FOR HUMAN FOOD				
Spray process				
(1) Nonfat dry milk solids				
(2) Dry buttermilk				
(3) Dry whey				
(4) Other nonfat dry milk products (name)				
Roller process				
(5) Nonfat dry milk solids				
(6) Dry buttermilk				
(7) Dry whey				
(8) Other nonfat dry milk products (name)				
FOR ANIMAL FEED (Spray and roller)				
(9) Dry skim milk				
(10) Dry buttermilk				
(11) Dry whey				

II. DRY WHOLE MILK — SHIPMENTS (Including L. C. L. and truck deliveries)

PROCESS	PRODUCTION Pounds	1–2½-POUND PACKAGES Quantity Pounds	Average price per pound Cents	5-POUND PACKAGE Quantity Pounds	Average price per pound Cents	ALL OTHER PACKAGES INCLUDING BARRELS AND DRUMS Quantity Pounds	Average price per pound Cents	TOTAL STOCKS ON HAND JANUARY 31, 1949 Pounds
Spray								
Roller								

¹ Include only shipments that have been sold. Do not include interplant or your into-storage movements.
² Manufacturer's factory price for shipments made.
³ Bulk and packed combined.

III. IF MORE THAN ONE PLANT IS COVERED IN THIS REPORT, GIVE FOLLOWING INFORMATION ON PRODUCTION: (Account for all production reported in sections I and II, above)

NAME OF PLANT	LOCATION OF PLANT	NAME PRODUCT MADE	POUNDS PRODUCED Spray	Roller

_____ (Signature of authorized official)

_____ (Name of firm)   _____ (Title)

_____ (Date)   *(Please use ink or typewriter)*

815160 U. S. GOVERNMENT PRINTING OFFICE

January 1949

. APPENDIX D-31. SPECIMENS OF SCHEDULES

[C. E. 9–82]

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
WASHINGTON, D. C.

Budget Bureau No. 40-R092.2
Approval expires Mar. 31, 1951

QUARTERLY REPORT OF EVAPORATED AND CONDENSED MILK STOCKS (CASE GOODS) IN HANDS OF WHOLESALE GROCERS, MARCH 31, 1949

DEAR SIR:

This survey is an attempt to measure changes in the stocks of evaporated and condensed milk held by the wholesale grocers. Results of previous inquiries of this kind have been helpful to concerns and organizations interested in producing and marketing these products.

Will you please cooperate by entering below the quantities of evaporated and condensed milk (both sold and unsold) held by your firm on March 31, 1949? Include goods on your own premises, goods in storage or in transit (unsold) for warehouse consignment; and goods sold or contracted for sale but not delivered. Also, estimate how many days total stocks of evaporated milk listed below will last on the basis of your current trade requirements.

Please fill in and return this schedule promptly in the enclosed envelope, which requires no postage.

W.F.Callander

W. F. CALLANDER
Assistant Chief,
Bureau of Agricultural Economics

	NET WEIGHT OF CANS	NUMBER OF CANS PER CASE	NUMBER OF CASES ON HAND MARCH 31, 1949	CODE	
				1	
Evaporated milk (unsweetened)	14½ oz.	48		2	
Evaporated milk (unsweetened)	6 oz.	96		3	
Evaporated milk (unsweetened)	6 oz.	48		4	
Evaporated milk (unsweetened)	8 lb.	6			
				5	
Condensed milk (sweetened)	15 oz.	24		6	
Condensed milk (sweetened)	14 oz.	24		7	
Condensed milk (sweetened)	14 oz.	48		8	
Condensed milk (sweetened)	11 oz.	48			

How many days' supply of EVAPORATED MILK do you estimate the above stocks represent?

_____ days.

_____
(Name of person reporting)

_____
(Position or connection with firm)

_____
(Name of firm)

_____
(Date)

☆ U. S. GOVERNMENT PRINTING OFFICE : 1949—O–823887

[C. E. 9–39]

Budget Bureau No. 40–R059.2.
Approval expires Feb. 28, 1951.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
WASHINGTON, D. C.

MONTHLY REPORT OF FLUID MILK PRICES
March 1949

TO FLUID MILK HANDLERS: The reports of fluid milk dealers, producer and distributor organizations, and others are used in compiling the Monthly Report of Fluid Milk Prices released for use of the trade, the producers, and others interested in market milk prices. Its continued usefulness depends upon adequate reports from all sources. Your reply SHOULD BE MAILED BEFORE THE FIFTH OF THE MONTH to the Bureau of Agricultural Economics. Please supply such of the information requested as applies to your territory.

Designate Date to Which Prices Apply if Different From Period for Which Asked.

W.F.Callander
Assistant Chief,
Bureau of Agricultural Economics.

SECTION I—DEALERS' BUYING PRICES PER CWT. IN MARCH 1949:

	F. O. B. CITY	DELIVERED AT COUNTRY RECEIVING PLANTS IN ZONE WHERE BULK OF SUPPLY IS RECEIVED	FREIGHT RATE OR TRUCKING CHARGE APPLYING TO BULK OF SUPPLY SHIPPED OR TRUCKED	BASIC FAT TEST	ALLOWANCE FOR $\frac{1}{10}$ PERCENT FAT VARIATION	
					To Producers	To Dealers
	Dol. per cwt.	*Dol. per cwt.*	*Cents per cwt.*	*Percent*	*Cents*	*Cents*
Class I or basic milk (bought for distribution as fluid milk)						
Class II milk (bought for distribution as fluid cream)						
Flat price for all milk if bought on flat basis						

Other classes (explain)

If any of the above Class Prices changed during February, or will be changed in early March, please show the effective date and give the reason for the change below:

CLASS I _____ (Date of change) _____ (Give reason for the change)

CLASS II _____ (Date of change) _____ (Give reason for the change)

FLAT BASIS _____ (Date of change) _____ (Give reason for the change)

OTHER _____ (Date of change) _____ (Give reason for the change)

Average last net blended price paid to your producers _____ (Month) _____ $ _____ ** per cwt. Point or zone to which applied _____

Basic fat test _____ Allowance for fat variation _____

**If this price exceeds the Class I price for that month, please explain:

SECTION II—PURCHASES OF MILK DURING MONTH OF JANUARY 1949 (report in pounds or gallons):

_____ lb. _____ gal.

(a) Total milk purchased from farmers _____ lb.

(b) Butterfat in total milk purchased from farmers _____ lb.

(c) Total dollars paid to *farmers* for milk purchased _____ $ _____

Do not delay returning schedule if this information not available. Report next month.

SECTION III—DEALERS' SELLING PRICES FOR MILK AND CREAM—MARCH 1949:

(c) RETAIL PRICES PAID BY CONSUMERS	DELIVERED TO HOMES		AT RETAIL STORES				OTHER TYPES OF RETAILERS (ROADSIDE DEPOTS, ETC.)	PREVAILING BUTTERFAT TEST
	GLASS CONTAINERS	PAPER CONTAINERS	INDEPENDENTS		CHAIN			
			Glass	Paper	Glass	Paper		
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Percent
Milk, bottled—Quart containers per single quart*								
Milk, bottled—Multiple quart containers: 2-quart container, each								
4-quart container, each								
Cream, bottled: Table cream — Per pint								
Per ½ pint								
Whipping cream — Per pint								
Per ½ pint								

*Report here the discount for more than one quart.

If dealers' selling prices, either retail (above) or wholesale (below), changed during February or will be changed in early March, please show the effective date of the change, the item changed, and the reason for the change.

(b) WHOLESALE PRICES	TO STORES	TO HOTELS, RESTAURANTS, HOSPITALS, ETC.	PREVAILING BUTTERFAT TEST
	Cents	Cents	Percent
Milk: Per gallon, bulk (5 to 20 gal.)			
Per quart, bottled			
Cream, table: Per gallon, bulk			
Per quart, bottled			
Per pint			
Per ½ pint			
Cream, whipping: Per 40-quart can			
Per gallon, bulk			
Per quart, bottled			
Per pint			
Per ½ pint			

SECTION IV—DEALERS' SELLING PRICES FOR SPECIAL GRADES OF MILK AND OTHER DAIRY PRODUCTS—MARCH 1949:

COMMODITIES AND GRADES	TO WHOLESALE TRADE	TO RETAIL TRADE
	Cents	Cents
(a) Special grades of milk per quart, bottled (name the grade):		
(b) Certified milk per quart, bottled		
(c) Cottage cheese (creamed) — Per pound		
Per package of ____ oz.		
No cream added — Per pound		
Per package of ____ oz.		

_____ (Firm name)

_____ (Signature of person reporting)

_____ (Official title or position)

_____ (Date)

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS—AGRICULTURAL ESTIMATES
WASHINGTON, D. C.

[C. E. 2-8299]

[DECEMBER 1947]

HONEY PRODUCTION REPORT

Maryland
915
58

DEAR SIR:

    To assist in the preparation of a report on **production and value of honey and wax,** needed by the Government and by beekeepers, will you kindly answer the following questions insofar as you are able to do so from records or memory. Please return this inquiry in the enclosed envelope **which requires no postage.**

                              Respectfully,

W. F. Callander
Chairman, Crop Reporting Board.

COLONIES OF BEES IN YOUR APIARY IN 1947: .... number.

1. Number at beginning of main honey flow .... number.

2. Number on hand now

HONEY AND BEESWAX PRODUCED BY YOUR BEES IN 1947, as follows:

3. Comb honey in sections or cut and wrapped .... pounds.

4. Extracted or strained honey .... pounds.

5. Bulk comb or chunk honey (comb and liquid honey mixed) .... pounds.

6. Beeswax .... pounds.

AVERAGE PRICES PER POUND RECEIVED BY YOU TO DATE IN 1947, as follows:

7. For honey sold in WHOLESALE quantities to dealers and large consumers:
    Comb, ... cents. Extracted, ... cents. Chunk, ... cents.

8. For honey sold RETAIL, in small quantities, direct to consumers:
    Comb, ... cents. Extracted, ... cents. Chunk, ... cents.

9. For beeswax, ... cents.

10. About how much honey was consumed in your household during the year 1947 for eating and cooking? .... pounds.

11. Stocks still remaining on hand for sale: HONEY .... pounds.
                                     BEESWAX .... pounds.

12. Stores of honey now on hives for use of bees during the winter and early spring .... Average per colony .... pounds.

COUNTY ....

STATE ....

NAME ....

POST OFFICE ....   16—53483-1   **USE OTHER SIDE FOR COMMENTS**

U. S. GOVERNMENT PRINTING OFFICE

APPENDIX D-35. SPECIMENS OF SCHEDULES

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
AGRICULTURAL ESTIMATES

Budget Bureau No. 40 R008.3.
Approval expires Jan. 31, 1949.

WASHINGTON, D. C.

PRICES RECE

APPENDIX D–36. SPECIMENS OF SCHEDULES

Form MF-16
(4–21–48)
(Formerly OMS-300)

Budget Bureau No. 40–R002.11.
Approval expires 7–31–49.

UNITED STATES DEPARTMENT OF AGRICULTURE
PRODUCTION AND MARKETING ADMINISTRATION
WASHINGTON 25, D. C.

Mail to:
U. S. DEPARTMENT OF AGRICULTURE
Production and Marketing Administration
Washington 25, D. C.
Attn.: Cold Storage Reports

MONTHLY COLD-STORAGE SCHEDULE

JUNE 1, 1949

(This schedule should be mailed within 5 working days after the first of the month)

JUNE 1, 1949

A report on this schedule is requested of every refrigerated storage facility, public warehouse, private warehouse, meat-packing plant, and apple house. The reports are confidential and no disclosures will be made of the data furnished by any firm. Only sworn employees of the United States Department of Agriculture are permitted to examine the schedules. Note especially Instruction No. 3 on reverse side.

COMMODITIES	CODE		STOCKS ON HAND JUNE 1, 1949	COMMODITIES	CODE		STOCKS ON HAND JUNE 1, 1949
FRESH FRUITS				**DAIRY PRODUCTS**			
				Cream (not including plastic)..........lb.	21	1	
Apples, western............standard boxes	01	1		Cream, plastic (75%–85% butterfat)...lb.		2	
Apples, western............other containers*		2		Butter, creamery..........................lb.		3	
Apples, eastern............bushel baskets		3		Condensed milk, sweetened and unsweetened			
Apples, eastern............other containers*		4		(Include all bulk goods)...............lb.		4	
*Report all apples in other containers in terms of bushels.				Evaporated and condensed milk(case goods) lb.	22	1	
Pears, Bartletts............packed boxes	02	1		Cheese, American Cheddar.............lb.		2	
Pears, Bartletts............loose boxes		2		Cheese, Swiss including block........lb.		3	
Pears, all other varieties............boxes		3		Cheese, all other varieties............lb.		4	
Pears............bushel baskets		4		**EGGS**			
Other fresh fruits..........................lb.	03	1		Eggs, shell..........................case	23	1	
				Eggs, frozen (total)......................lb.	24	1	
FRESH VEGETABLES				Whites..........................lb.		2	
Potatoes..........................lb.	04	1		Yolks..........................lb.		3	
Onions..........................lb.		2		Mixed..........................lb.		4	
Celery..........................lb.		3		Eggs, dried..........................lb.	25	1	
Other fresh vegetables..........................lb.		4		**FROZEN POULTRY**			
				Broilers, chickens up to 30 lb. per dozen.lb.	31	1	
DRIED FRUITS, CANNED FRUITS, AND VEGETABLES, AND NUTS				Fryers, chickens 31 to 42 lb. per dozen...lb.		2	
				Roasters, chickens 43 lb. and up, per dozen..........................lb.		3	
Dried and evaporated fruits, all kinds...lb.	11	1		Fowls, hens, all weights..............lb.		4	
Canned fruits and vegetables, all kinds..lb.		2		Turkeys..........................lb.	32	1	
Nutmeats:				Ducks..........................lb.		2	
Peanuts..........................lb.		3		Miscellaneous frozen poultry (geese, guineas, cocks, and all other varieties not classified above)..........................lb.		3	
Other nuts..........................lb.		4					
Nuts in shell:							
Peanuts..........................lb.	12	1		Unclassified frozen poultry..............lb.		4	
Other nuts..........................lb.		2					

16–53188–3

- **DO NOT DETACH** -

SPACE AND OCCUPANCY REPORT AS OF JUNE 1, 1949

Fill in the table below, indicating the total amount of refrigerated space and the space occupied in your plant on the above date. (Meat packers and processors should not include refrigerated working space.)

ITEM	COOLERS 30° F. to 50° F.	FREEZERS 20° F. and below
Total net piling space (in cubic feet)		
Total space occupied (in cubic feet)		
New space due to plant expansion since last report (in cubic feet)		

NET PILING SPACE means space for the storage of food commodities, i. e., the space inside rooms, measured from wall to wall and floor to ceiling, minus space for ventilation (outside of the pile), coils, aisles, posts, sprinklers, and the like.

SPACE OCCUPIED. Report only the actual number of cubic feet taken up by the commodities stored.

Received _____

Edited _____

Punched _____

16–53188–1

(SEE OTHER SIDE)

APPENDIX D–37. SPECIMENS OF SCHEDULES

MONTHLY COLD-STORAGE SCHEDULE

(This schedule should be mailed within 5 working days after the first of the month)

COMMODITIES	CODE		STOCKS ON HAND JUNE 1, 1949	COMMODITIES	CODE		STOCKS ON HAND JUNE 1, 1949
FROZEN FRUITS				**MEATS AND MEAT PRODUCTS**			
				Beef, frozen_____lb.	71	1	
Apples_____lb.	41	1		Veal, frozen_____lb.		2	
Apricots_____lb.		2		Pork, frozen_____lb.		3	
Blackberries_____lb.		3		Lamb and mutton, frozen_____lb.		4	
Blueberries_____lb.		4		Beef, in cure, cured, and smoked:	72	1	
Cherries_____lb.	42	1		Cooler_____lb.		2	
Grapes_____lb.		2		Freeser_____lb.			
Peaches_____lb.		3		Dry salt pork, in cure and cured:		3	
Plums and prunes_____lb.		4		Cooler_____lb.		4	
Raspberries_____lb.	43	1		Freeser_____lb.			
Strawberries_____lb.		2		All other pork, in cure, cured, and smoked:	73	1	
Young, Logan, Boysen, and similar ber-				Cooler_____lb.		2	
ries_____lb.		3		Freeser_____lb.		3	
Fruit juices and purees_____lb.		4		All edible offal_____lb.	74	1	
Other frozen fruits_____lb.	44	1		Lard_____lb.		2	
				Rendered pork fat_____lb.			
FROZEN VEGETABLES				Sausage and sausage-room products:	75	1	
				Cooler_____lb.		2	
Asparagus_____lb.	51	1		Freeser_____lb.			
Beans, lima_____lb.		2		Canned meats and canned-meat prod-		3	
Beans, snap_____lb.		3		ucts_____lb.			
Broccoli_____lb.		4					
Brussels sprouts_____lb.	52	1		**MISCELLANEOUS**			
Cauliflower_____lb.		2					
Corn, sweet_____lb.		3		Hides and pelts_____lb.	81	1	
Peas, green_____lb.		4		All commodities other than fish not re-			
Pumpkin and squash_____lb.	53	1		ported above:			
Spinach_____lb.		2		Cooler_____lb.		2	
Other frozen vegetables_____lb.		3		Freeser_____lb.		3	

Received _____
Edited _____
Punched _____
Checked _____
O. K. _____

Signed by _____

Title _____

16—62189–2   GPO

INSTRUCTIONS

1. All concerns are sent two copies of this monthly schedule. One copy is for your files.

2. REFRIGERATED STORAGE FACILITY means any storage place in public or private warehouses, meat-packing plants or apple houses artificially cooled to a temperature of 50° Fahrenheit or lower, in which food commodities are stored for a period of at least 30 days. "Refrigerated storage facility" does not include: (1) Space in a plant operated as a part of an established wholesale food business (i. e., the purchase and resale of food products without materially changing their form or quality for distribution within a 30-day period out of warehouses to independent retail outlets or to commercial, industrial, or institutional users); (2) space in a plant operated as a part of an established retail food business, hotel, or other establishment where persons are housed or fed; (3) space occupied by individual lockers having a capacity of less than 25 cubic feet each.

3. STOCKS ON HAND should always be the total quantities held under refrigeration in an establishment regardless of ownership at the beginning of business on the first day of the month. Net weights should be given for all commodities reported in terms of pounds.

4. AMERICAN CHEESE means only CHEDDAR cheese in the recognized styles such as twins, flats, daisies, longhorns, square prints, etc.

5. MEAT TRIMMINGS should be included with appropriate type of meat.

6. WESTERN APPLES are those apples grown in the following States: Washington, Oregon, California, Idaho, Nevada, Wyoming, Montana, Utah, Colorado, Arizona, and New Mexico.

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics
Crop Reporting Board

STATE _____

SUBMITTED _____
(Date)

AGRICULTURAL STATISTICIAN'S SPECULATIVE REPORT

DATE _____
(to which data relate)

ITEM	CROP........................				FARM STOCKS				
	Reported Condition		Probable or Final Yield		Reported Farm Stocks Data (Percent of Production)				
	Incl. Zeros (1)	Excl. Zeros (2)	Incl. Zeros (3)	Excl. Zeros (4)	CORN (5)	WHEAT (6)	OATS (7)	(8)	(9)
Aids No.									
Special No.									
Aids St.									
Aids Wt.									
Special St.									
Special Wt.									
Statistician									

* Show all speculative stocks data on one separate sheet.
COMMENTS: (Use other side of this sheet if necessary).

APPENDIX E–2. SPECIMENS OF SUMMARY FORMS

CATTLE DECEMBER 1, 19__ RURAL CARRIER SUMMARY SHEET

APPENDIX E–4. SPECIMENS OF SUMMARY FORMS

C.E.F. 119

YEAR 19
CATTLE: BALANCE SHEET

U. S. Dept. of Agriculture
Crop Reporting Board

	ON HAND				
	First of year		End of year		Total Weight* (000) Lbs.
	Head (000)	Av. Wt.*	Head (000)	Av. Wt.*	
Milk Cows 2 Yrs. + ..					First of Yr.... ___
" Heifers 1-2 Yrs..					End of Yr....... ___
Heifer Calves					Diff. in Wt.... ___
Other Cows 2 Yrs. +..					
Beef Heifers 1-2 Yrs.					
Other Calves					
Steers 1 Yr. + ...					*For Washington Use
Bulls 1 Yr. + ...					
Total					

- - - HEAD - - -
(Thousands)

DEBIT

On Hand First of Yr... ___
Calf Crop:
   Cows 2 Yrs. + ___
   % Calf Crop. ___
Inshipments .... ___

Total .... ___

CREDIT

	Cattle	Calves	Total
Shipped:			
Recorded :........	___	___	___
Other	___	___	___
Local Slaughter	___	___	___
Farm Slaughter	___	___	___
Deaths	___	___	___
Total	___	___	___
Indic. on Hand End of Year	___	___	___
% Change	___	___	___

BASIC DATA ON DISPOSITION

INSHIPMENTS

		Cattle	Calves	Total
B.A.I.	Feeding...............			___
	Breeding & Dairy.......			___
State Insp.	Feeding	___		
	Breeding	___		
Rail		___	___	___

OUTSHIPMENTS

	Cattle	Calves	Total
Mkt. Record...	___	___	___
State Insp....	___	___	___
Rail, Total...	___	___	___
	___	___	___
	___	___	___
STATE ___			

CATTLE: BALANCE SHEET   YEAR 19

Separate mailing lists are maintained in Washington and at each field office, and all reports are mailed free of charge to persons requesting them. Requests for any of the reports issued in the field should be sent direct to the address as given in the following list.

Cotton Market News

Atlanta 3, Ga.	441 West Peachtree St. NE.
Bakersfield, Calif.	430 27th St.
Dallas 1, Tex.	1104 South Ervay St.
Memphis 1, Tenn.	1117 Falls Bldg., P.O. Box 363.
Washington 25, D. C.	Production and Marketing Administration, U. S. Department of Agriculture.

Dairy and Poultry Market News

Atlanta 3, Ga.	449 West Peachtree St. NE.
Baltimore 2, Md.	801 Appraisers' Stores Bldg.
Boston 10, Mass.	723 Appraisers' Stores Bldg., 408 Atlantic Ave.
Chicago 5, Ill.	623 South Wabash Ave.
Cincinnati 2, Ohio	504 U. S. Post Office and Court House Bldg.
Cleveland 15, Ohio	Northern Ohio Food Terminal, 4000 Orange Ave.
Columbus 15, Ohio	Bureau of Markets, 718 State Office Bldg.
Denver 2, Colo.	555 U. S. Custom House, 19th and Stout Sts.
Des Moines 9, Iowa	1019 High St.
Detroit 26, Mich.	1402 Cadillac Square Bldg.
Dover, Del.	Delaware Bureau of Markets.
Fayetteville, Ark.	Bureau of Research, University of Arkansas.
Fort Worth 2, Tex.	511-513 U. S. Court House, 10th and Lamar Sts.
Harrisonburg, Va.	116 Reservoir St.
Los Angeles 21, Calif.	298 Wholesale Terminal Bldg., 784 S. Central Ave.
Madison 2, Wis.	Rm. 342N State Capitol Bldg.
Montgomery 1, Ala.	State Dept. of Agriculture, 515 Dexter Ave.
New Orleans 12, La.	804 Masonic Temple Bldg., 333 St. Charles Ave.
New York 14, N. Y.	641 Washington St., Rm. 822.
Philadelphia 61, Pa.	604-A Custom House Bldg., 2d and Chestnut Sts.
Pittsburgh 22, Pa.	508 Victory Bldg., Corner 9th St. and Liberty Ave.
Portland 5, Oreg.	308 U. S. Court House.
Raleigh, N. C.	Division of Markets, Agriculture Bldg.
St. Louis 2, Mo.	946 U. S. Custom House, 1114 Market St.
Salisbury, Md.	County Court House.
San Francisco 11, Calif.	737 Appraisers' Stores Bldg., 630 Sansome St.
Seattle 4, Wash.	236 Federal Office Bldg.
Washington 25, D. C.	Production and Marketing Administration, U. S. Department of Agriculture.

Fruit and Vegetable Market News

Atlanta 3, Ga.	449 West Peachtree St. NE.
Bakersfield, Calif.	723 East 21st St.
Baltimore 2, Md.	801 Appraisers' Stores Bldg.
Birmingham, Ala.	1310 First Ave. North.
Boston 10, Mass.	722 Appraisers' Stores Bldg., 408 Atlantic Ave.
Chicago 81, Ill.	305 Produce Traders Bldg., 1421 S. Aberdeen St.
Cincinnati 2, Ohio	505 U. S. Post Office and Court House Bldg.
Cleveland 15, Ohio	Northern Ohio Food Terminal, 4000 Orange Ave.
Columbus 15, Ohio	Bureau of Markets, 718 State Office Bldg.
Denver 2, Colo.	555 U. S. Custom House, 19th and Stout Sts.
Detroit 9, Mich.	21 Detroit Union Produce Terminal, 7201 W. Fort St.
Fort Worth 2, Tex.	511-513 U. S. Court House, 10th and Lamar Sts.
Fresno, Calif.	2305 Los Angeles St.
Jacksonville, Fla.	State Marketing Bureau, 505 West Adams St.
Kansas City 6, Mo.	317 U. S. Court House, 8th and Grand Ave.
Little Rock, Ark.	106 Center St.
Los Angeles 21, Calif.	300 Wholesale Terminal Bldg., 784 S. Central Ave.
Minneapolis 3 (including St. Paul), Minn.	302 Gorham Bldg., Box D, Traffic Station.
Montgomery, Ala.	State Dept. of Agriculture, 515 Dexter Ave.
New Orleans 12, La.	804 Masonic Temple Bldg., 333 St. Charles Ave.
New York 14, N. Y.	641 Washington St., Rm. 820.
Oklahoma City, Okla.	State Board of Agriculture, 122 Capitol Bldg.

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Philadelphia 6, Pa.	604-F Custom House Bldg., 2d and Chestnut Sts.
Pittsburgh 22, Pa.	508 Victory Bldg., Corner 9th St. and Liberty Ave.
Portland 5, Oreg.	312 U. S. Court House.
Raleigh, N. C.	Division of Markets, Agriculture Bldg.
Richmond, Va.	Division of Markets.
St. Louis 2, Mo.	942 U. S. Court and Custom House, 1114 Market St.
Sacramento, Calif.	Bureau of Markets, State Office Bldg.
San Antonio, Tex.	215 Livestock Exchange Bldg., P.O. Box 800.
San Francisco 11, Calif.	727 Appraisers' Stores Bldg., 630 Sansonie St.
Santa Maria, Calif.	712B South Broadway.
Seattle 4, Wash.	228 Federal Office Bldg.
Stevens Point, Wis.	Wisconsin Dept. of Agriculture.
Washington 25, D. C.	Production and Marketing Administration, U. S. Department of Agriculture.
Yakima, Wash.	235 Liberty Bldg., Third and A Sts.

Grain Market News

Chicago 7, Ill.	1204 Post Office Bldg.
Kansas City 6, Mo.	325 U. S. Court House, 8th St. and Grand Ave.
Los Angeles 21, Calif.	304 Wholesale Terminal Bldg., 784 S. Central Ave.
Minneapolis 1, Minn.	116 Federal Office Bldg.
Montgomery 1, Ala.	State Dept. of Agriculture, 515 Dexter Ave.
Portland 5, Oreg.	345 U. S. Court House.
San Francisco 11, Calif.	731 Appraisers' Stores Bldg., 630 Sansome St.
Washington 25, D. C.	Production and Marketing Administration, U. S. Department of Agriculture.

Livestock Market News

Baltimore 23, Md.	3 Claremont Hotel, Union Stock Yards.
Billings, Mont.	Union Stock Yards, 210 Livestock Exchange Bldg.
Boston 10, Mass.	408 Atlantic Ave., Rm. 703.
Chicago 9, Ill.	Rm. 301, 999 Exchange Ave., Union Stock Yards.
Cincinnati 25, Ohio	110 Livestock Exchange Bldg.
Denver 16, Colo.	214 Livestock Exchange Bldg.
Des Moines 9, Iowa	1019 High St.
Detroit 9, Mich.	204 Livestock Exchange Bldg., 6750 Dix Ave.
Fort Worth 6, Tex.	233 Livestock Exchange Bldg.
Houston 4, Tex.	Livestock Exchange Bldg., 4905 Calhoun Rd.
Indianapolis 21, Ind.	244 Livestock Exchange Bldg.
Kansas City 15, Mo.	964 Livestock Exchange Bldg.
Los Angeles 11, Calif.	206 Livestock Exchange Bldg., Union Stock Yards.
Louisville 6, Ky.	231 Livestock Exchange Bldg.
Memphis 5, Tenn.	465 West Trigg Ave.
Montgomery 1, Ala.	State Dept. of Agriculture, 515 Dexter Ave.
Nashville 3, Tenn.	406 Tennessee State Office Bldg.
National Stock Yards, Ill.	59 Exchange Bldg., P. O. Box 102.
New York 14, N. Y.	641 Washington St., Rm. 824.
Ogden (including Salt Lake City), Utah	209 Livestock Exchange Bldg.
Oklahoma City 8, Okla.	200 Livestock Exchange Bldg.
Omaha 7, Nebr.	309 Livestock Exchange Bldg.
Peoria 2, Ill.	Union Stock Yards.
Portland (North), Oreg.	207 Livestock Exchange Bldg.
Raleigh, N. C.	Division of Markets, Agriculture Bldg.
Richmond, Va.	Division of Markets.
San Antonio 6, Tex.	215 Livestock Exchange Bldg., P.O. Box 800.
San Francisco 11, Calif.	717 Appraisers' Stores Bldg., 630 Sansome St.
Sioux City 11, Iowa	103 Livestock Exchange Bldg.
South St. Joseph, Mo.	318 Livestock Exchange Bldg.
South St. Paul, Minn.	203 Federal Bldg.
Spokane, Wash.	Rm. 4, Old Union Stock Yards, P.O. Box 2184.
Stockton, Calif.	P. O. Box 1827.
Thomasville, Ga.	218 P. O. Bldg.
Washington 25, D. C.	Production and Marketing Administration, U. S. Department of Agriculture.
Wichita 2, Kans.	22 Livestock Exchange Bldg.

Tobacco Market News

Louisville, Ky.	440 Federal Bldg., P.O. Box 480.
Raleigh, N. C.	504 Capital Club Bldg., P.O. Box 549.
Washington 25, D. C.	Production and Marketing Administration, U. S. Department of Agriculture.

COTTON MARKET NEWS REPORTS

Cotton Quotations.—Ten Designated Spot Markets is issued daily from Memphis, Tennessee. It gives prices for the base grade of spot cotton (Middling 15/16 inch staple) quoted at 10 spot markets, differences quoted in the markets for grades and staple lengths above and below the base grade, and certain other price information.

Cotton Price Quotations is issued weekly from Atlanta, Ga.; Memphis, Tenn.; and Dallas, Tex., during the harvesting and ginning season (September to January). It gives prices for Middling 15/16 inch staple and for certain grade and staple differentials quoted at central markets. With a grade certificate and this report, the farmer can determine approximately what he should get for his cotton and whether it would pay him to place it in the loan program.

The Weekly Cotton Market Review is issued from Atlanta, Ga.; Memphis, Tenn.; Dallas, Tex.; Bakersfield, Calif., and Washington, D. C., and is a summary of the cotton market situation up to the close of business on Thursday of each week. This report, with the exception of the Washington, D. C., release, includes weekly cotton price quotations at central markets and leading domestic mill points.

Cotton Quality Report shows estimated proportions of the various qualities, including grade and staple length, of cotton ginned in the United States and in individual States and districts during the current ginning period and the season to date. It is issued twice a month during the principal part of the ginning season and on the same dates that the Bureau of the Census reports on volume of ginnings. Reports for the country as a whole are released from Washington, D. C., and reports for individual States are released from Atlanta, Ga.; Memphis, Tenn.; Dallas, Tex., and Bakersfield, Calif.

Cotton Price Statistics is a compilation of cotton prices and grade and staple premiums and discounts at spot markets and mill points. It is issued monthly from Washington, D. C., and contains a brief statement of developments relating to prices of cotton during the month. It also reports prices for unfinished cloth, cotton prices, and mill margins.

Cotton Quality Statistics—United States is issued annually from Washington, D. C. (in the Commodity Statistics Series) as soon as possible after the end of the ginning season. It contains statistics relating to quality of cotton ginned in the United States and in individual States and statistics showing quality of cotton in the carry-over.

Quality of Cotton in the Carry-Over—United States is issued annually from Washington, D. C., as soon as possible after August 1. It gives statistics on grade, staple length, and tenderability of upland cotton, and staple length of foreign cotton carried over in the United States August 1.

Weekly Cotton Linters Review is released from Washington, D. C. It gives a summary of market information on linters, tables showing the current low and high prices (f.o.b. cottonseed oil mills, uncompressed) and of each grade of linters with comparisons, and tables relating to production, supply, consumption, etc. of linters in the United States.

The Cottonseed Review is issued weekly from Atlanta, Ga.; Memphis, Tenn.; and Dallas, Tex., during the active marketing season. These reports show the high, low, and average grades of cottonseed by counties; the average wagon-lot price paid farmers in important cotton-producing counties; and general information relating to market conditions for cottonseed throughout the industry.

Cottonseed Quality in the United States is issued annually from Washington, D. C., as soon as possible after the close of the season. It contains statistics on the quality of cottonseed graded in the United States and in individual States, crop-reporting districts, and by specified periods during the season.

DAIRY AND POULTRY MARKET NEWS REPORTS

Daily Market Report (Dairy and Poultry Products) is issued at most of the field offices. The report covers conditions of supply and demand, prices, and trends in the local market or the nearby producing areas. The coverage, which includes commodities of most importance locally, is fairly complete in some markets but only partially complete in others. Most local reports include prices and summaries from other markets which are of importance to local producers and distributors.

Daily Live Poultry Market Report is issued at New York, N. Y., only. It includes prices and comments on the live and dressed poultry markets at New York, N. Y.; Philadelphia, Pa.; Boston, Mass.; Chicago, Ill.; and the principal commercial broiler-producing areas.

The turkey market is reported at most offices daily from the beginning of active marketing in November until the close of holiday trading. Reports show wholesale prices in terminal markets and contain available information regarding prices paid in producing areas.

Semiweekly Market Report (Federal-State) is issued from Des Moines, Ia.; Frankfort, Ky.; and Montgomery, Ala. Reports contain information regarding prices of eggs and poultry in the principal producing areas of Iowa, Kentucky, and Alabama and comments on prevailing market conditions. They also include reports from terminal markets which are of importance to local producers and distributors.

Summary of Egg and Poultry Markets is issued weekly from the major markets. It summarizes developments for the week, with comments on prices, receipts, supplies, demand, production, and other factors pertinent to egg and poultry markets. Commodities regularly included are shell eggs, live poultry, dressed poultry, and turkeys in season.

Weekly Dairy Markets Review is issued from the major cities. It summarizes developments of the week with comments on prices, receipts, supplies, demand, storage stocks, production, and other factors pertinent to dairy-products markets. Commodities regularly included are butter, cheese, fluid milk and cream, evaporated and condensed milk, nonfat dry milk solids, and casein.

Weekly Milk and Cream Market Report is issued from New York, N. Y.; Philadelphia, Pa.; and Boston, Mass. It reports receipts by railroads and motortrucks

of milk, cream, and fresh bulk condensed milk by States of origin, and current prices and comments on sweet cream at the above markets.

Monthly Domestic Dairy Markets Review is issued from Washington, D. C., at the end of each month. The report is a general narrative summary of the month's developments and covers all important dairy products. A statistical summary, published separately, contains tables that show receipts of butter and cheese at terminal markets; total United States storage stocks of butter, cheese, condensed and evaporated milk, nonfat dry milk solids, and cream on the first of the month; and weekly stocks of butter and cheese in 35 cities. Other tables show average monthly prices of butter, cheese, fluid milk, cream, evaporated and condensed milk, nonfat dry milk solids, and casein, and retail movements of butter at Chicago, Ill. and San Francisco, Calif. An annual review is issued at the end of each year.

Monthly Egg and Poultry Markets Review is issued from Washington, D. C., at the end of each month. The review, in narrative form, summarizes the previous month's developments for all egg and poultry products. A supplement, in tabular form, shows receipts of eggs and poultry at terminal markets and at primary markets in the central West, the Pacific coast, and in eastern egg auctions; retail movements of eggs at Chicago, Ill.; Los Angeles, Calif.; and San Francisco, Calif.; prices of eggs and live poultry at Chicago, Los Angeles, New York, Philadelphia, and San Francisco; and cold-storage holdings in the United States on the first of the month and weekly in 35 cities. A narrative summary is issued at the end of each year.

Monthly Milk and Cream Market Report is issued from Boston, New York, and Philadelphia. It is a summary of the data contained in the Weekly Milk and Cream Market Report and shows receipts of milk and cream by State of origin and mode of transportation.

Monthly Origin of Receipts by States is issued from most of the field offices. It shows receipts of butter, cheese, shell and frozen eggs, live and dressed poultry at each local market, by State of origin, for each month. Annual summaries are also available.

Monthly Cold-Storage Report—Total U. S. Stocks is issued from most of the market news offices. It is based on material collected by the Marketing Facilities Branch, Production and Marketing Administration. The report shows stocks of butter, cheese by varieties, shell eggs, frozen eggs, and poultry by classes as of the first of each month.

Dairy and Poultry Market Statistics—an annual summary of market statistics—is issued annually from Washington, D. C., in the Commodity Statistics Series. It summarizes dairy and poultry market statistics published during the preceding year in daily, weekly, and monthly market reports.

FRUIT AND VEGETABLE MARKET NEWS REPORTS

A daily market report is issued from each permanent office. These reports show prices and conditions of all commodities sold over the local wholesale market, together with a report of carlot shipments for the entire country, local boat and rail receipts, diversions and track holdings, and, in some markets, motortruck receipts. They also contain information on f.o.b. prices from major shipping areas, and in some cases, limited information from other terminal markets.

Daily reports are issued from seasonal offices during the active harvesting and marketing seasons. They give a day-to-day picture of the particular crop in which the region is just then vitally interested. These reports show: Rate of movement, supplies in all markets, prices in terminal markets of the local product and of other products sold in competition with it, volume of shipment from competing areas, f.o.b. prices paid at home and elsewhere, the relative progress of the current season as compared with former seasons, the prospect for greater or less volume out of competing territory, and the effects of weather both on market demand and on progress of moving the crop. At present, the following reports are issued from seasonal offices:

REPORTS BEING ISSUED FROM SEASONAL OFFICES

Seasonal offices	Crops covered	Approx. Period of operation
Allendale, S. C.	Watermelons	June 25–July 20.
Bakersfield, Calif.	Vegetables	Year round.
Belle Glade, Fla.	Vegetables	Nov. 1–May 15.
Benton Harbor, Mich.	Fruits and vegetables	Aug. 1–Apr. 15.
Brawley, Calif.	Vegetables and melons	Dec. 1–July 15.
Charleston, S. C.	Potatoes	May 10–June 10.
Cordele, Ga.	Watermelons	June 15–July 25.
Corpus Christi, Tex.	Onions	May 1–May 25.
Crystal Springs, Miss.	Vegetables	Apr. 20–June 30.
Foley, Ala.	Potatoes	Apr. 25–May 29.
Fresno, Calif.	Grapes, melons, vegetables	Year round.
Hamlet, N. C.	Peaches	July 1–July 31.
Hammond, La.	Strawberries	Mar. 20–May 1.
Hastings, Fla.	Potatoes	Apr. 1–May 20.
Idaho Falls, Idaho	Potatoes	Sept. 25–Apr. 1.
Jacksonville, Tex.	Tomatoes	June 1–June 30.
Lakeland, Fla.	Citrus	Oct. 1–June 15.
Laredo, Tex.	Onions	Apr. 5–Apr. 30.
Leesburg, Fla.	Watermelons	May 10–June 15.
Macon, Ga.	Peaches	June 1–July 25.
Martinsburg, W. Va.	Apples and peaches	Sept. 10–Dec. 15.
Nashville, Ark.	Peaches	July 5–July 31.
Onley, Va.	Potatoes	June 1–July 25.
Payette, Idaho	Fresh prunes	Sept. 1–Sept. 20.
Phoenix, Ariz.	Vegetables—melons	Nov. 15–July 31.
Plant City, Fla.	Strawberries—vegetables	Jan. 1–May 1.
Pompano Beach, Fla.	Vegetables	Dec. 1–March 31.
Presque Isle, Maine	Potatoes	Sept. 10–May 10.
Rochester, N. Y.	Fruit and vegetables	Aug. 25–May 10.
Salinas, Calif.	Vegetables	Apr. 1–Jan. 1.
Sanford, Fla.	Celery	Jan. 1–June 1.
Santa Maria, Calif.	Vegetables	Year round.
Spartanburg, S. C.	Peaches	June 25–Aug. 10.
Washington, N. C.	Potatoes	May 25–June 30.
Weslaco, Tex.	Citrus—Vegetables	Oct. 15–May 30.
Yuma, Ariz.	Lettuce—Cantaloups	Nov. 15–July 15.

Weekly Summary of Carlot Shipments is issued from Washington, D. C. It summarizes the daily shipment reports to show the total number of cars of each product shipped from each State, by weeks, and shipping season, as reported by telegraph by transportation companies.

Carlot Unloads of Fruits and Vegetables is issued monthly in summarized form from each of the permanent market news offices.

Annual Summary of Carlot Unloads Fresh Fruits and Vegetables is issued in each of the above cities for local markets only. It is an annual summary of the carlot unloads in the markets of each of the cities named.

Carlot Shipments of Fruits and Vegetables by Commodities, States, and Months is issued annually from Washington, D. C. It covers carlot shipments of certain fresh fruit and vegetables, also dried apples, peaches, and prunes as reported by the carriers, and motortruck shipments where available.

Carlot Unloads for 100 U. S. and 5 Canadian Cities is issued annually from Washington, D. C. It includes condensed summarization of reports indicated in the foregoing paragraph on 21 commodities for 27 markets with reports from 73 additional United States and 5 Canadian cities.

Carlot Shipments of Fruits and Vegetables—summaries by commodities, counties, and billing stations— is issued annually from Washington, D. C. A summary is compiled for each of the States showing carlot shipments of certain fresh fruits and vegetables; also for dried apples, peaches, and prunes, by months, counties, and billing stations.

Wholesale Prices of Fruits and Vegetables at New York, Chicago, and Leading Shipping Points is issued annually from Washington, D. C. It includes average prices of practically all fresh fruits and vegetables on which market news prices are reported. These prices are summarized by months for important sources, varieties, containers, and sizes of the fruits and vegetables.

Seasonal Shipping Point Summaries. A brief summary is issued by most seasonal offices at the time the office closes or shortly thereafter. Each report is a summary for the season of the information that was reported daily by that seasonal office and it constitutes a complete statistical history of the marketing of the crop grown in that area.

Weekly Peanut Report is issued from Washington, D. C. It gives arrivals of peanuts on important markets where fruit and vegetable market news offices are maintained, and range of market prices for different varieties and grades; prices and conditions prevailing in the three principal producing sections; and shipments of peanuts and crude peanut oil by cleaners, shellers, and crushers as reported by millers at points

of shipment. Acreage, yield per acre, production statistics, and the monthly stocks and processing figures issued by the Bureau of Agricultural Economics, and other pertinent information are published as available.

Semimonthly Honey Report is issued from Washington, D. C. It gives information concerning prices and general conditions relating to bees, nectar-producing plants, and important honey-producing sections of the country. Supplies of honey on the market at important cities where fruit and vegetable market news offices are maintained, and the range of market prices for different flavors and grades of comb and extracted honey are reported. Prices of beeswax are reported on some of these markets.

GRAIN MARKET NEWS REPORTS

Daily Alfalfa Market Review is issued from Los Angeles, Calif. It covers the local market on alfalfa and includes information as to receipts, prices, and demand.

Weekly Alfalfa Market Review is issued from Los Angeles, Calif.; Portland, Oreg.; and Kansas City, Mo., and covers the general situation in alfalfa hay markets and producing areas. The Kansas City report also gives current market information concerning prairie hay markets.

Barley and Feed Grain Market Review is issued weekly from Portland, Oreg. and San Francisco, Calif. It covers the week's developments in the Pacific coast barley and feed-grain markets, including movements, demand, and prices.

Bean Market Review is issued weekly from Los Angeles and San Francisco, California. It reports the market situation for beans in California and to a limited extent in the other Western bean-growing areas. It also includes prices of the principal varieties of California beans at San Francisco and Los Angeles and prices to growers, as well as such pertinent foreign market information as may be obtained from reports to the Office of Foreign Agricultural Relations.

Commercial Grain Stocks Report is prepared at Washington, D. C., and issued weekly from that office and also from Chicago, Ill.; Kansas City, Mo.; Minneapolis, Minn.; Portland, Oreg.; and San Francisco, Calif. It lists domestic stocks at 45 points in the United States and stocks of United States grain in Canada. Includes data on Canadian grain in the United States and Canadian grain in Canada.

Weekly Feed Market Review is issued from Chicago, Ill.; Kansas City, Mo.; Los Angeles, Calif.; Minneapolis, Minn.; Portland, Oreg.; San Francisco, Calif.; and Washington, D. C. It shows market developments as to the supply and demand for feed, together with prices of the more basic feeds at the principal markets.

Weekly Grain Market Review is issued from Chicago, Ill.; Kansas City, Mo.; Minneapolis, Minn.; Portland, Oreg.; and San Francisco, Calif. It gives the week's developments in the markets for the principal grains, including the latest reports on progress of the various crops in the United States. Movements, supply, demand, prices of the principal grades and classes of grains, and other market influences are shown.

Hop Market Review is issued weekly from Portland, Oreg.; and San Francisco, Calif., during the principal marketing season; monthly during the remainder of the year. It discusses the hop-market situation on the Pacific Coast and gives prices to growers.

Weekly Rice Market Review is issued from Washington, D. C., and San Francisco, Calif. It covers the current supply, demand, and price situation in the principal markets.

Alfalfa Meal Production is issued monthly from Washington, D. C. It gives production of both sun-cured and dehydrated meal as reported by millers and grinders.

Brewers' Dried Grain Production is issued monthly from Washington, D. C. It gives production as reported by manufacturers.

Distillers' Dried Grain Production is compiled monthly in Washington, D. C. It gives data on production and stocks of distillers, dried grain as reported by manufacturers.

Rice Stocks and Movement (Southern and California) is issued monthly from Washington, D. C., and San Francisco. It gives quantity of rough rice received and milled and quantity of milled rice produced and shipped.

Inspected Receipts of Soybeans is issued monthly from Washington, D. C., and shows quantity of soybeans, by class and grade, inspected upon receipt at inspection points.

Barley Market Summary is issued quarterly from Chicago, Ill.; Minneapolis, Minn.; Portland, Oreg.; and San Francisco, Calif., and gives data showing production, supplies, demand, utilization, and prices.

Feed Market Summary is issued quarterly from Chicago, Ill.; Kansas City, Mo.; Los Angeles, Calif.; Minneapolis, Minn.; Portland, Oreg.; San Francisco, Calif.; and Washington, D. C. It gives data as to production and distribution of the principal grain byproduct feeds, oilseed cakes and meals, and certain other byproduct feeds.

Flaxseed Market Summary is issued quarterly from Minneapolis, Minn., and San Francisco, Calif., and gives data as to production and utilization, including imports, crushings, etc.

Oats Market Summary is issued quarterly from Chicago, Ill.; Minneapolis, Minn.; Kansas City, Mo.; and Portland, Oreg., and gives data relating to production, supplies, demand, utilization, and prices.

Rye Market Summary is issued quarterly from Chicago, Ill., and Minneapolis, Minn., and gives data on production, supplies, demand, utilization, and prices.

Soybean Market Summary is issued quarterly from Chicago, Ill., and gives data on production, supplies, demand, and distribution.

Alfalfa Market Semiannual Summary is issued from Los Angeles, Calif., and gives data showing production, shipments, utilization, and prices of alfalfa hay in the Los Angeles area. Includes some information for the entire State of California.

Barley Market Summary is issued semiannually from San Francisco, Calif., and gives market summaries and statistics on production, stocks, utilization, and prices of California barley.

Grain Sorghum Market Summary is issued semiannually from San Francisco, Calif., and Kansas City, Mo. It includes market summaries and statistics on production, marketings, market situation, and prices for grain sorghums from a number of cities and the average farm price for the United States.

Semiannual Durum Report is issued semiannually from Minneapolis, Minn., and contains market sum-

maries and statistics on supplies and utilization of durum wheat.

Annual Market Summary of California Rice is issued from San Francisco, Calif., and gives data on production and disappearance of California rough rice and production and distribution of milled rice; and shipments to territories, domestic utilization, exports, and prices by varieties.

Annual Market Summary of Southern Rice is issued from Washington, D. C., and contains the same type of data as is given in the *Annual Market Summary of California Rice*.

LIVESTOCK MARKET NEWS REPORTS

Daily Interior Iowa and Southern Minnesota Hog Market Report is issued daily from Des Moines, Iowa. It covers supply, demand, trend of prices, and prices paid for hogs sold direct to packers or dealers at approximately 30 concentration yards and 14 packing plants in interior Iowa and southern Minnesota. It also gives brief summaries of the hog trade at several public markets.

Daily Livestock Market Report is issued each market day except Saturday from Billings, Mont.; Chicago, Ill.; Cincinnati, Ohio; Denver, Colo.; Fort Worth, Tex.; Indianapolis, Ind.; Kansas City, Mo.; Los Angeles, Calif.; Louisville, Ky.; Nashville, Tenn.; National Stock Yards, Ill.; Ogden, Utah; Oklahoma City, Okla.; Omaha, Nebr.; Peoria, Ill.; San Antonio, Tex.; San Francisco, Calif.; Sioux City, Iowa; South St. Paul, Minn.; Spokane, Wash., and Wichita, Kans. Reports are also issued Monday, Wednesday, and Friday at Montgomery, Ala.; Monday and Thursday at Baltimore, Md.; Monday, Tuesday, Wednesday, and Thursday at Detroit, Mich., and North Portland, Oreg. and Monday and Friday at Stockton, Calif. A daily summary of six livestock markets is issued by the New York office. Reports cover supply, demand, prices and trends of the local market. Most of the reports include a brief summary of a few other markets that are important to producers who patronize the local market.

Daily Special Grass Cattle Market Report is issued daily except Friday and Saturday from mid-July to November 15 from Denver, Colo.; Chicago, Ill.; National Stock Yards, Ill.; St. Joseph, Mo.; Kansas City, Mo.; Omaha, Nebr.; and Sioux City, Iowa. It gives brief statements of trade conditions and prices paid for cattle marketed from the range and large pasture areas.

Hog Market Report (Southeast) is issued daily from Thomasville, Ga. It covers direct hog marketings in sections of the Southeast daily during the fall, winter, and early spring months, and tri-weekly reports during the summer. Brief summaries of the Montgomery, Ala., and several other public livestock markets and some auction markets are included.

Sheep and Lamb Market Report is issued daily from Des Moines, Iowa. It covers supply, demand, trend of the market, and prices paid at major packing plants in interior Iowa and southern Minnesota.

Livestock Market News—Reviews & Statistics is issued weekly from Washington, D. C. It carries market news information pertaining to livestock, meat, and wool, with brief interpretive articles and special discussions dealing with economic conditions and developments in these industries. Current weekly livestock price and supply data are carried, including prices of livestock at representative markets; wholesale meat

prices at New York, Chicago, and San Francisco; wool prices at Boston; weekly and monthly slaughter of animals under Federal inspection; storage holdings of meat and lard; production and consumption of meats and lard; classification and source of purchase of livestock slaughtered; monthly average costs, live weights, and dressing yields of livestock slaughtered; monthly volume of meats graded by Federal graders; meats processed monthly under Federal inspection; prices received by farmers for livestock, feed grains, and hay.

A special livestock report is issued weekly from South St. Joseph, Mo., and Sioux City, Iowa. It is a review of the local livestock market prepared especially for distribution to radio stations, country papers, and to banks and other financial institutions.

Stocker and Feeder Report is issued weekly from Chicago, Ill.; Kansas City, Mo.; Omaha, Nebr.; Sioux City, Iowa; and South St. Paul, Minn. It provides a summary of local market conditions for the week on stocker and feeder cattle, hogs, and sheep, plus statistical tabulations covering State destinations of shipments and numbers and average prices of various classes by specific weight divisions.

Weekly Livestock Market Review gives market conditions for the week at the market where released, including detailed information as to receipts, demand, and prices paid for the various classes and grades of livestock. Each Friday a telegraphic review covering the livestock market at Chicago, Ill., is released by the New York office.

Weekly Livestock Statistical Report is issued from Chicago, Ill. It shows comparative receipts of salable cattle at 12 markets; beef steers sold out of first hands at Chicago for slaughter; movements of feeder and stocker cattle for 4 markets, weekly, periodically, and seasonally, with average weights and costs; comparative receipts of salable hogs at 12 markets; weekly average weight and cost of hogs at 6 markets; comparative receipts of salable sheep at 12 markets; feeder and stocker cattle and sheep received in 8 Corn Belt States (monthly); weekly slaughter under Federal inspection at 32 selected centers; monthly slaughter under Federal inspection; total all stations.

Western Sheep and Lamb Contract Report is issued weekly during the sheep and lamb contracting season from: Chicago, Ill.; Denver, Colo.; Fort Worth, Tex.; Kansas City, Mo.; North Portland, Oreg.; Ogden, Utah; Omaha, Nebr.; San Francisco, Calif.; South St. Joseph, Mo.; and South St. Paul, Minn.

Weekly Slaughter Under Federal Inspection at 32 Selected Centers is issued from Chicago, Ill. It shows the slaughter of livestock by species under Federal inspection by cities or areas, covering 32 slaughter centers, by weeks, with comparisons.

Animals Slaughtered Under Federal Inspection is compiled by the Bureau of Animal Industry and is released monthly by field offices. It shows the number of cattle, calves, hogs, sheep and lambs, goats, and horses slaughtered under Federal Meat Inspection during the preceding month with total and comparisons.

Receipts and Disposition of Livestock at 66 Public Markets is issued monthly from Washington, D. C., and shows salable and total receipts, driven-in receipts, and disposition of livestock, monthly, with comparisons.

Stocker and Feeder Cattle and Sheep Received in Several Corn Belt States is compiled by the Bureau of Agricultural Economics and is disseminated monthly by field offices. It gives statistics on the movement of stocker and feeder cattle and sheep covering eight Corn Belt States, and segregates direct shipments from those

originating in public markets. Statistics cover the preceding year, and the cumulative totals for the expired portion of the current and preceding calendar year.

Cattle and Calves: Monthly Average Price per 100 Pounds is issued annually from Washington, D. C., and gives monthly average prices by class and grade on approximately 28 markets.

Cattle and Calves: Weekly Average Price per 100 Pounds is issued annually from Washington, D. C., and gives weekly average prices by class and grade on approximately 28 markets.

Hogs: Monthly Average Price per 100 Pounds is issued annually from Washington, D. C., and gives monthly average prices by class and grade on approximately 28 markets.

Hogs: Weekly Average Price per 100 Pounds is issued annually from Washington, D. C. It gives weekly average prices by class and grade on approximately 28 markets.

Sheep: Monthly average price per 100 pounds is issued annually from Washington, D. C., and gives monthly average prices by class and grade on approximately 28 markets.

Sheep: Weekly Average Price per 100 Pounds is issued annually from Washington, D. C., and gives weekly average prices by class and grade on approximately 28 markets.

Livestock Market News, Statistics, and Related Data is issued annually from Washington, D. C. It is a handbook containing receipts, shipments, and prices of livestock, meat, and wool, number of livestock on farms, Federal slaughter, cold-storage holdings, live and dressed weights, retail prices of meats, exports and imports, meat production and consumption, wool production, wool exports and imports, and mill consumption of wool.

Livestock Receipts at Public Stockyards in Order of Volume is issued annually from Washington, D. C., and gives livestock receipts, based on reports submitted by stockyard companies at approximately 66 cities.

Daily Report of Meat Trade Conditions and Wholesale Quotations is issued each market day except Saturday from Chicago and New York. The Chicago report contains wholesale prices of fresh and smoked meats dressed in the Chicago area and market comments. The New York report contains wholesale prices of fresh and cured meats dressed in local and in Western markets and market comment.

Semiweekly Review of Meat Trade Conditions.— Reviews are issued Tuesday and Thursday from San Francisco, covering San Francisco and the Bay District, and from Los Angeles, covering the Los Angeles area. A review covering the Northwest area, including Portland, Oreg.; Seattle and Tacoma, Wash., is issued on Wednesdays and Fridays from Portland. It covers wholesale trading in fresh and smoked meat.

USDA Meat Production Report is issued weekly from Washington, D. C. It gives current weekly figures as to number of livestock slaughtered and meat production under Federal inspection with comparisons. It also carries average weights of livestock slaughtered and figures showing production of lard, with a regional break-down of numbers slaughtered.

Weekly Review of Meat Trade Conditions—Locally Dressed Meats is issued from New York and covers the week's market on locally dressed meat. Also covers wholesale trading on the local markets in western dressed fresh meat.

Cold-Storage Holdings of Meats and Lard is compiled by the Marketing Facilities Branch of the Production and Marketing Administration and is released monthly by market news field offices. It shows stocks of frozen and cured beef and pork (including lard), frozen lamb and mutton, and miscellaneous meats, in storage on the first of each month in the United States.

Western Dressed Fresh Meats and Cured Pork Cuts and Lard is issued annually from Washington, D. C., separately for each market. It gives weekly and monthly average wholesale prices per 100 pounds in the New York, Chicago, and San Francisco markets.

Weekly Review of the Boston Wool Market is issued from Boston. It carries comments on wool market conditions and price quotations on the principal grades and classes of domestic and foreign wool and mohair for the Boston market.

Weekly Review of Wool Statistics is issued from Boston. It contains statistical summaries of general imports and distribution of unmanufactured wool, by class and type and country of origin, at the ports of Boston, New York, and Philadelphia.

Monthly Review of the Boston Wool Market is issued from Boston, and carries comments on wool market conditions and prices of the principal grades and classes of domestic and foreign wool and mohair on the Boston market.

Domestic Wool: Average Prices at Boston is issued annually from Washington, D. C., in two publications. One shows average weekly prices and the other average monthly prices on the Boston market.

TOBACCO MARKET NEWS REPORTS

A daily *Press Release* for each of the Southern types of tobacco gives high lights of daily market activities and average prices for a limited number of representative grades, with changes from pervious day.

A *Daily Tobacco Market Price Report* for each of the Southern types of tobacco includes average auction prices for each grade sold during the day, average price for total sales, loan rates, and volume of daily sales. It is furnished to all auction markets serving a type and is primarily intended for use of growers when they sell tobacco.

A weekly *Press Release* is issued from each of the field offices for each of the Southern types of tobacco. It gives a summary of market activities for the week and average prices for a limited number of representative grades, with changes from the previous week.

The *Weekly Market News Report* is a detailed summary of the week's marketing activities. It includes an analysis and comparison of price trends, demand, volume of sales, nature of offerings, average prices for total sales, loan rates, and a fairly complete list of weekly and season-to-date average prices by grades.

A season *Press Release* is issued from each field office for each of the Southern types of tobacco. It summarizes the marketing season, gives season averages by grades, and shows season gross sales and averages by markets.

A *Season Tobacco Market News Report* is issued from each of the field offices for each of the Southern

types of tobacco. It summarizes the marketing season, gives averages by grades, and shows season gross sales and averages by markets.

Annual Tobacco Market Review is issued from Washington, D. C., at the close of the season in four separate publications, one for each of the following tobacco classes: (1) Flue-Cured, (2) Fire-cured, (3) Light Air-Cured, (4) Dark Air-Cured. Each gives comparable analyses of marketing seasons, detailed statistics as to sales and prices, and other pertinent data.

APPENDIX H–1. SPECIMENS OF MARKET NEWS REPORTS

UNITED STATES DEPARTMENT OF AGRICULTURE
Production and Marketing Administration
1104 S. Ervay St.,   Dallas 1, Texas

January 12, 1949

Vol. XXX, No. 25   FARMERS WEEKLY COTTON PRICE QUOTATIONS

For use by farmers as a guide in selling cotton. The approximate market price in cents per pound for each quality is figured by adding the (+) quotations to or subtracting the (–) quotations from the current New York futures price. Quotations are for mixed lots, delivered uncompressed in warehouse and relate to qualities equal to the official cotton standards. March New York closed today 32.49 cents. The daily New York futures price can be secured from your RADIO OR NEWSPAPER.

Staple Length Inches	SM Pts.	M Pts.	SLM Pts.	LM Pts.	SGO Pts.	M Pts.	SLM Pts.
	White					Spotted	
	DALLAS						
13/16	-260	-300	-450	-850	-1150	-625	-1125
7/8	-160	-200	-350	-750	-1050	-525	-1000
29/32	-60	-100	-250	-650	-1000	-425	-900
15/16	+40	Even	-150	-600	-950	-325	-800
31/32	+65	+25	-125	-600	-950	-290	-800
1"	+90	+50	-100	-600	-950	-280	-800
1-1/32	+115	+75	-75	-600	-950	-270	-800
1-1/16	+140	+100	-50	-600	-950	-250	-800
	ABILENE						
13/16	-355	-405	-555	-930	-1380	-880	-1080
7/8	-215	-255	-405	-780	-1280	-730	-980
29/32	-5	-80	-380	-755	-1255	-705	-955
15/16	+75	-5	-305	-655	-1195	-655	-905

	SM Pts.	M Pts.	SLM Pts.	LM Pts.	SGO Pts.	M Pts.	SLM Pts.	LM Pts.
	White					Spotted		
	HOUSTON							
13/16	-320	-350	-465	-875	-1275	-575	-1200	-1475
7/8	-195	-225	-340	-775	-1175	-475	-1075	-1375
29/32	-95	-125	-240	-675	-1075	-375	-975	-1325
15/16	+5	-25	-140	-575	-975	-275	-875	-1275
31/32	+25	-5	-120	-575	-975	-270	-875	-1275
1"	+55	+25	-95	-550	-975	-265	-875	-1275
1-1/32	+80	+50	-75	-550	-975	-260	-875	-1275
1-1/16	+105	+75	-50	-550	-975	-255	-875	-1275
	LUBBOCK							
13/16	-350	-375	-500	-750	-1000	-650	-900	-1350
7/8	-250	-275	-400	-650	-900	-550	-800	-1250
29/32	-175	-200	-325	-550	-800	-475	-700	-1150
15/16	-75	-100	-225	-500	-800	-375	-600	-1050

UNITED STATES DEPARTMENT OF AGRICULTURE
Production & Marketing Administration
Dairy & Poultry Market News Service

604-A Custom House
2nd & Chestnut Sts.

Telephones
Market 7-6000, ex. 32 & 33

DAILY MARKET REPORT
(Dairy & Poultry Products)
Philadelphia 6, Pa.

Wednesday, May 25, 1949

Vol. 60 No. 102

The prices reported herein reflect current purchases or sales. Wholesale prices of commodities shown in the table below are selling prices by 'first receivers' of wholesale quantities. F. O. B. prices are those paid by first hand receivers.

Commodity	Philadelphia	New York	Chicago	Boston
		Wholesale Selling Prices		
BUTTER: (Bulk in fibre boxes) (Cents per lb.)				Not Reported
AA (93 score)	-	60.00-60.50	59.50	
A (92 score)	60.25-61.50	59.25-59.75	58.75-59.00	
B (90 score)	57.00-57.50	56.50	57.00-58.00	
		Wholesale Selling Prices		
EGGS: (Cents per doz.)				54.5-56.5
Consumer Grades:				
A, extra large	53 -55	-	-	
A, large	51 -53	-	-	
A, medium	50 -51	-		
Wholesale Grades:				
Specials, extra large (Min. 20% AA quality)	55 -58	57 -58	-	-
large	53 -56	53 -56	-	-
medium	51 -52	52 -53	-	-
Extras, extra large (Min. 60% A quality)	-	52 -55	-	-
large	48.5-51	48.5-52	46 -48	-
medium	49.5-50	49 -51	43 -44	-
Standards (Min. 20% B quality)	-	-	42 -42.5	-
Current Receipts	44 -46	44 -45	41.5-42	
Extras, minimum 70% A quality				
		Wholesale Selling Prices		F. O. B. Prices
LIVE POULTRY: (Cents per lb. - No. 1 & fancy qual.)				34 -38
Fowl, heavy type	35 -40	32 -48	30 -33	-
Fowl, light type	28 -33	30 -35	27	-
Pullets, 4½ lbs & over	35 -45	43 -52	-	
		40		

APPENDIX H–2. SPECIMENS OF MARKET NEWS REPORTS

FEDERAL–STATE MARKET NEWS SERVICE

Minnesota Department of
Agriculture
Marketing Division
Cooperating
Minneapolis 3, Minnesota
Tuesday May 24, 1949

U.S. Dept. of Agriculture
Production & Marketing Admin.
Fruit & Vegetable Branch
307 Gorham Building
Telephones
Ma. 7304 Mi. 6535

DAILY FRUIT AND VEGETABLE REPORT VOL.XXXV NO. 101

unless otherwise stated the following quotations cover sales to 9:30 AM on this morning's wholesale
market in less than carlot quantities on stock of good merchantable quality and condition
Temperature at 7 AM 45 Clear. Maximum temperature yesterday 59.

MINNEAPOLIS MARKETS

STREET SALES TO RETAILERS

APPLES:Market steady.WASH.Boxes,wrapped,Winesaps,
ex fcy. 163s 5.75 Delicious ex fcy 163s 5.00,
Comb. ex fcy & fcy 163s & lgr Red Delicious 6.00
6.50. 198-216s 4.75-5.00. Delicious 163s & lgr
5.50-6.00, 175-216s 4.00-5.00,mostly 4.50-5.00.
Winesaps 125s & lgr 6.25-6.50 150s 6.00-6.25 163s
5.00-5.50,mostly 5.00-5.25. 175-216s 3.50-4.50,
mostly 4.00-4.25 "C" Grade Winesaps 1.75-216s
3.00 Boxes face & fill-Winesaps cond ex fcy &
fcy 2" min 2.50.
ARTICHOKES:CALIF. Boxes 60s 5.00.
AVOCADOS:CALIF. Flats 24s 4.60-5.00 30s 4.75-5.00
BEANS:Market steady Miss bu hprs stringless blk
Vals 4.50-4.75.
BEETS:TEXAS ½ crts. bched 3 doz 2.75-3.00. 50#
sacks topped,washed TEXAS 2.50-2.75.
BROCCOLI:Calif Pony crts bched 28s 7.00-7.50.
CABBAGE:Market about steady Dom Rnd type 50# Miss
3.50-4.00,mostly 3.50-3.75,fair cond 3.00 ord
cond 2.00 Miss, wirebound crts approx. 50# 3.75-
4.00,mostly 3.75.
CANTALOUPS:Texas Jumbo crts 18-45s ord qlty & cond
2.00-2.25 few high as 6.50.
CARROTS:Market steady L.A. Crts Bchd 6 doz CALIF.
Impl.Vly & Ariz. small, med 4.50-5.25 mostly

NOTE: Two jobbers still closed by truckers strike.
RUTABAGAS:MINN. 50# sacks waxed 2.00-2.25,mostly
2.00-2.10.
SPINACH:Prepackaged crtns of 12-12 oz cello wrap-
ped bags, clipped leaf 2.00-2.10.
STRAWBERRIES:Market sli weaker 24 qt crts Ky
Blakemores & Aromas, fair to gen'l good qlty &
cond. 8.75-9.00,fair to ord qlty & cond 7.50-8.00,
ord qlty & cond 6.50,poor qlty & cond 4.00-5.00.
Mo.Blakemores fair to gen'l good qlty & cond
7.50-8.50,mostly 8.00 fair to ord qlty & cond
6.00-7.00 mostly 6.50 poor qlty & cond 4.00-5.00
mostly 4.00.Ark.Blakesmores Fair to gen'l good
qlty & cond 8.00-8.50,mostly 8.00 fair to ord
qlty & cond 7.50.

WATERMELONS:Fla. Black Diamonds per lb. 24-26 lb.
6-7¢ mostly 6-6½¢ 28-32 lb average 6-8¢ mostly
6½-7¢.
ONION SETS:Ill 32# sacks Yellows 15/16" 2.75-.
TOMATOES:Originals: Market sli weaker.Lugs,green,
turning & ripes. Texas US#1 6x6s & lgr 4.00-4.75,
mostly 4.50. 6x7 3.50-3.75 Mexico 85% or more
US#1 qlty 6x6s & lgr 6.00-6.25 6x7s 5.75-6.00
7x7s 6.00.Repack 30# lugs 6.50-7.00,mostly 6.50.

UNITED STATES DEPARTMENT OF AGRICULTURE
Production and Marketing Administration
Grain Branch

WEEKLY FEED MARKET REVIEW

| Volume XXXII No. 21 | Washington 25, D. C. | May 25, 1949 |

WHEAT MILLFEED MARKETS DECLINED SHARPLY AS DEMAND SLACKENED

A sharp drop in wheat millfeed prices to a more normal relationship with other
feeds was the outstanding feature in the feed market during the week ended May 24
according to reports to the Department of Agriculture. Improved pasturage, lib-
eral supplies of feed grains, and a material slackening in demand following the
sharp price gains of recent weeks were principally responsible for a decline in
millfeeds. While the lower prices of bran and middlings had a weakening influ-
ence on the market for other feeds, declines in most of the other feeds were
relatively small. Corn feeds were unchanged to about $1.50 per ton lower. Oil-
seed meals were steady to about $1.00 per ton under a week ago. The principal
feed grains were about unchanged to 75¢ per ton higher. The index number of
feedstuff prices dropped 6 1/2 points, to 222.9, reflecting principally the sharp
decline in the wheat millfeeds, while the feed grain index advanced nearly 3
points, to 192.5.

WHEAT MILLFEEDS: Production of millfeeds increased about 2,000 tons during the
week and totaled 80,700 tons compared with a little over 103,000 for the cor-
responding week a year earlier. Prices dropped sharply as offerings became more

APPENDIX H–3. SPECIMENS OF MARKET NEWS REPORTS

UNITED STATES DEPARTMENT OF AGRICULTURE
PRODUCTION AND MARKETING ADMINISTRATION
LIVESTOCK BRANCH
CHICAGO 9, ILLINOIS

TELEPHONE
YA 7-6520

ROOM 301
999 EXCHANGE AVENUE

DAILY LIVESTOCK MARKET REPORT - MONDAY, MAY 16, 1949 - VOL. XXXII - 95

STOCKYARD RECEIPTS OF SALABLE LIVESTOCK

		CATTLE	CALVES	HOGS	SHEEP
CHICAGO	TODAY (ESTIMATED)	13,000	500	7,500	1,000
	WEEK AGO (ACTUAL)	13,790	382	8,662	121
"	YEAR AGO (ACTUAL)	10,118	793	14,799	1,646
•TWELVE MARKETS	TODAY (ESTIMATED)	62,300	6,700	63,400	31,400
" "	WEEK AGO (ACTUAL)	58,376	6,352	64,773	15,236
" "	YEAR AGO (ACTUAL)	57,135	9,324	76,969	50,528

•CHICAGO, CINCINNATI, DENVER, FT.WORTH, INDIANAPOLIS, KANSAS CITY, ST.LOUIS NATIONAL STOCKYARDS, OMAHA, OKLAHOMA CITY, SIOUX CITY, SO.ST.JOSEPH, SO.ST.PAUL.

ACTUAL RECEIPTS AND DISTRIBUTION OF LIVESTOCK AT CHICAGO PUBLIC MARKET

	CATTLE	CALVES	HOGS	SHEEP
SALABLE LIVESTOCK:				
RECEIPTS, MAY 13, 1949	853	226	4,512	816
RECEIPTS, MAY 14, 1949	329	30	126	4
PURCH. FOR LOCAL SLAUGHTER, MAY 13, 1949	801	123	3,954	270
PURCH. FOR LOCAL SLAUGHTER, MAY 14, 1949	—	—	78	—
TOTAL LIVESTOCK:				
TOTAL RECEIPTS, MAY 13, 1949	915	393	6,088	816
TOTAL RECEIPTS, MAY 14, 1949	355	114	1,481	20
TOTAL SHIPMENTS, MAY 13, 1949	936	22	1,544	79
TOTAL SHIPMENTS, MAY 14, 1949	147	15	66	490

CHICAGO LIVESTOCK MARKET REPORT - MONDAY, MAY 16, 1949
(BASED ON MARKET CONDITIONS AND SALES REPORTED UP TO 2:00 P.M. CST)

CATTLE AND CALVES

SUPPLY AND DEMAND WERE CLOSELY BALANCED AND ANY PRICE SHIFTING THAT OCCURRED ON THE WEEK'S OPENING SESSION APPEARED RATHER N...

UNITED STATES DEPARTMENT OF AGRICULTURE
Tobacco Branch, Production & Marketing Adm.
North Carolina Department of Agriculture
Division of Markets, Cooperating

Wilson, North Carolina

404 Post Office Bldg.

October 2, 1948

No. 7

WEEKLY TOBACCO MARKET NEWS REPORT - TYPE 12
EASTERN NORTH CAROLINA FLUE-CURED

Strong demand on the part of manufacturers and dealers during the seventh week of Eastern North Carolina flue-cured tobacco sales resulted in highest averages of the season for practically all grades report the United States and North Carolina Departments of Agriculture.

The increases in grade averages for the week ending September 30 ranged from 25¢ to $7.00 per hundred when compared with the previous week. The most telling gains were made in leaf and lugs which comprised two-thirds of all marketings. These grades were up generally $3.00 to $6.00. Smoking leaf and primings were $1.00 to $4.00 higher and cutters steady to stronger. While the practical top average was $67.00, it was not unusual for individual baskets of best quality offerings to bring from $70.00 to $80.00 per hundred.

Volume of sales was fairly heavy. For the week ending Friday, October 1, gross sales totaled 37,765,517 pounds and averaged $54.53 per hundred. This average exceeded last week's by $4.13 for the highest of the season. On Monday the general average hit $55.68 with individual market averages ranging up to $60.59. Season gross sales now stand at 260,170,471 pounds averaging $48.07.

The quality was slightly better to also influence the higher general average.

APPENDIX I-1. STATISTICAL COVERAGE OF FARM PRODUCTS

Field, Seed, and Truck Crops, Fruit, and Tree Nuts

Crop	Acreage: Intentions	Acreage: Planted	Acreage: Harvested 1/	Production	Production by classes, by kinds	Stocks	Disposition 2/	Monthly marketing	Prices received by farmers 3/	Value of production	Value of sales	Semimonthly progress report
Field crops												
Barley	X	X	X	X		X	X	X	X	X	X	X
Beans (dry edible)	X	X	X	X	X		X	X	X	X	X	X
Broomcorn	X	X	X	X			X	X	X	X	X	X
Buckwheat	X	X	X	X			X	X	X	X	X	X
Corn, all	X	X	X	X								
Corn for grain		X	X	X		X	X	X	X	X	X	X
Corn for hogging, grazing or forage		X	X	X								
Corn for silage		X	X	X			X	X	X	X		X
Corn, hybrid												
Cotton lint	X	X	X	X			X	X	X	X	X	X
Cottonseed	X	X	X	X			X		X	X	X	X
Cowpeas grown alone	X	X										
Cowpeas interplanted		X										
Cowpeas, equivalent solid acres		X										
Cowpeas for peas		X	X	X	X		X	X	X	X	X	X
Cowpeas grazed or plowed under		X										
Flax fiber	X	X	X	X		X	X	X	X	X		
Flaxseed	X	X	X	X		X	X	X	X	X	X	X
Hay, all		X	X	X					X			
Hay, wild		X	X	X					X			
Hay, alfalfa		X	X	X					X			
Hay, clover & timothy		X	X	X					X			
Hay, lespedeza		X	X	X					X			
Hay, soybean		X	X	X					X			
Hay, cowpea		X	X	X					X			
Hay, peanut		X	X	X					X			
Hay, grain		X	X	X					X			
Hay, other		X	X	X					X			
Hemp for fiber	X	X	X	X			X		X	X	X	X
Hemp for seed	X	X	X	X								
Maple products (sugar & sirup)		X	X 2/	X	X	X	X	X	X	X	X	X
Mung beans	X	X	X	X								
Oats	X	X	X	X		X	X		X	X	X	X
Peanuts alone	X	X	X									
Peanuts interplanted	X	X	X									
Peanuts, equivalent solid acres	X	X	X	X					X	X		

APPENDIX I–2. STATISTICAL COVERAGE OF FARM PRODUCTS

Crop	Acreage: Intentions	Acreage: Planted	Acreage: Harvested	Production	Production: by classes by kinds	Stocks	Disposition	Monthly marketings	Prices received by farmers	Value of production	Value of sales	Semimonthly progress report
Field crops (continued)												
Peanuts, picked and threshed		X	X	X						X	X	
Peas (dry field)	X	X	X	X		X	X		X	X	X	
Popcorn	X	X	X	X	X		X	X	X	X	X	
Rice	X	X	X	X		X	X		X	X	X	
Rye	X	X	X	X		X	X	X	X	X	X	
Sorghums, all purposes	X	X	X	X					X	X	X	
Sorghums for forage			X	X								
Sorghums for grain	X	X	X	X		X	X	X	X	X	X	
Sorghums for silage			X	X					X	X		
Sorgo sirup			X	X			X		X	X	X	
Soybeans, grown alone	X	X	X									
Soybeans interplanted		X	X									
Soybeans, equivalent solid acres		X	X	X								
Soybeans, for beans			X	X		X	X	X	X	X	X	
Soybeans, grazed or plowed under			X									
Sugar beets for sugar	X	X	X	X			X		X	X	X	
Sugar (beet)			X	X						X	X	
Pulp (sugar beet)												
Sugarcane sirup			X	X					X	X	X	
Sugarcane for sugar & seed			X	X								
Sugar & molasses (sugarcane)			X	X						X		
Tobacco, by States	X	X	X	X			X		X	X	X	
Tobacco, by classes & types	X	X	X	X	X				X	X		
Velvet beans, all purposes	X	X	X	X					X	X		
Wheat, durum	X	X	X	X		X	X		X	X	X	
Wheat, other spring	X	X	X	X		X	X		X	X	X	
Wheat, winter	X	X	X	X		X	X		X	X	X	
Wheat, all	X	X	X	X	X	X	X	X	X	X	X	
Seed crops												
Alfalfa			X	X		X	X		X	X	X	
Alsike clover			X	X		X	X		X	X	X	
Crimson clover			X	X		X			X	X		
Red clover			X	X		X	X		X	X	X	
Sweet clover			X	X		X	X		X	X	X	

APPENDIX I-3. STATISTICAL COVERAGE OF FARM PRODUCTS

Crop	Acreage: Intentions	Acreage: Planted	Acreage: Harvested	Production 1/	Production: by kinds	Production: by classes	Stocks	Disposition	Monthly marketings	Prices 3/ received by farmers	Value of production	Value of sales	Semimonthly progress report
Seed crops (continued)													
White clover			X	X			X						
Ladino clover			X	X			X			X			
Bromegrass			X	X			X			X	X		
Crested wheatgrass			X	X			X			X	X		
Ky. Bluegrass			X	X			X			X	X		
Meadow Fescue			X	X			X			X	X		
Orchard grass			X	X			X			X	X		
Redtop			X	X			X			X	X		
Rye grass			X	X			X			X	X		
Sudan grass			X	X			X			X	X	X	
Timothy			X	X			X					X	
Lespedeza seed			X	X	X		X	X		X	X		
Mustard seed			X	X	X		X	X		X	X		
Vetches (4)			X	X	X					X	X		
Austrian winter peas			X	X			X			X	X		
Seed potatoes, certified				X	X		X						
Rapeseed				X	X		X			X	X		
Lupine				X			X			X	X		
Vegetable seeds (50 kinds)				X	X								
Commercial Truck Crops For:													
Fresh Market 5/													
Artichokes			X	X									
Asparagus	X		X	X						X	X		X
Beans, green lima			X	X						X	X		X
Beans, snap			X	X						X	X		X
Beets			X	X						X	X		X
Cabbage	X		X	X			X			X	X		X
Cantaloupes			X	X						X	X		X
Carrots			X	X						X	X		X
Cauliflower			X	X						X	X		X
Celery			X	X						X	X		X
Corn, sweet			X	X						X	X		X
Cucumbers			X	X						X	X		X
Eggplant			X	X						X	X		X
Escarole			X	X						X	X		X
Garlic			X	X						X	X		X
Honey Ball Melons			X	X						X	X		X
Honey Dew Melons			X	X						X	X		X
Kale			X	X						X	X		X
Lettuce			X	X						X	X		X
Mint for oil			X	X						X	X		X

APPENDIX I-4. STATISTICAL COVERAGE OF FARM PRODUCTS

Crop	Intentions	Planted	Harvested 1/	Production	Production by classes: by kinds	Stocks	Disposition 2/	Monthly marketings by farmers	Prices 3/ received by farmers	Value of production	Value of sales	Value: Semimonthly progress report
Commercial Truck Crops For Fresh Market 5/ (Continued):												
Onions	X		X	X					X	X		X
Peas, green			X	X					X	X		X
Peppers, green			X	X								X
Potatoes, commercial early 6/	X		X	X		X			X	X		X
Shallots			X	X					X	X		X
Spinach			X	X					X	X		X
Tomatoes			X	X					X	X		X
Watermelons	X		X	X					X	X		X
Truck Crops For Commercial Processing:												
Asparagus	X	X	X	X					X	X		X
Beans, green lima	X	X	X	X					X	X		
Beans, snap	X	X	X	X					X	X		
Beets	X	X	X	X					X	X		
Cabbage for sauerkraut	X	X	X	X					X	X		X
Corn, sweet	X	X	X	X					X	X		X
Cucumbers for pickles	X	X	X	X		X			X	X		X
Peas, green	X	X	X	X					X	X		
Pimientos		X	X	X					X	X		
Spinach			X	X					X	X		
Tomatoes	X	X	X	X					X	X		
Potatoes and Sweetpotatoes:												
Potatoes, total crop	X	X	X	X		X	X		X	X	X	
Sweetpotatoes, total crop	X	X	X	X			X		X	X	X	
Noncitrus Fruits:												
Apples			X	X			X		X	X	X	
Apricots			X	X			X		X	X	X	
Avocados			X	X	7/		X 8/		X 9/	X	X	
Cherries 10/			X	X			X		X	X	X	
Cranberries			X	X			X		X	X	X	
Dates			X	X			X		X	X	X	
Figs			X	X			X		X	X	X	
Grapes 11/			X	X			X		X	X	X	
Olives			X	X			X		X	X	X	
Peaches 11/			X	X			X 8/		X 9/	X	X	
Pears 12/			X	X			X 8/		X	X	X	
Persimmons			X	X			X 8/		X 9/	X	X	
Pineapple			X	X			X 8/		X	X	X	
Plums			X	X			X		X 9/	X	X	
Pomegranates			X	X			X 8/		X	X	X	

APPENDIX I–5. STATISTICAL COVERAGE OF FARM PRODUCTS

Crop	Acreage: Intentions	Planted	Harvested	Production 1/ Harvested	Production by classes by kinds	Stocks	Disposition 2/	Monthly marketings	Prices 3/ received by farmers	Value of production	Value of sales	Value: Semimonthly progress report
Noncitrus Fruits (Cont'd)												
Prunes			X	X			X		X	X		
Strawberries	X		X	X					X	X	X	X
Citrus Fruits												
Grapefruit 13/			X	X			X		X	X	X	
Lemons			X	X			X		X	X	X	
Limes			X	X			X		X	X	X	
Oranges 10/			X	X			X		X	X	X	
Tangerines			X	X			X		X	X	X	
Tree Nuts												
Almonds			X	X			X 8/		X 9/	X	X	
Filberts			X	X			X		X 9/	X	X	
Pecans 10/				X			X 8/		X 9/	X	X	
Walnuts			X	X			X		X	X	X	

1/ Acres for harvest in the case of truck crops for fresh market, bearing acres in the case of fruits and tree nuts. 2/ Includes utilization of sales in the case of fruits and tree nuts. 3/ Includes prices by utilization groups. 4/ Trees tapped. 5/ For each crop, separate estimates are made for the winter, spring, summer, and fall seasons, with appropriate sub groupings (early, mid, late) under each season. 6/ Included with all potatoes. 7/ Includes separate estimates for 18 important varieties. 8/ Utilization estimates not available for these items. 9/ Prices by utilization groups not available. 10/ Includes estimates by varietal groups. 11/ Includes estimates by varietal groups for Calif. 12/ Includes estimates by varietal groups for Calif., Ore., and Wash. 13/ Includes estimates by varietal groups for Fla. and by areas for Calif.

APPENDIX I-6. STATISTICAL COVERAGE OF FARM PRODUCTS

Livestock and products	Number on farms	Breeding intentions	Births	Number raised	Inspments	Deaths	Production	Disposition	Sales	Prices rec'd by farmers	Value of sales	Commercial slaughter	Farm slaughter	Value of home consumption	Gross Income	Value of production	Stocks	Condition
Cattle and calves	×		×		×	×	×		×	×	×	×	×	×	×	×		×
By age, sex, and use classes, Jan. 1	×																	
On feed for market	×				×													×
On pasture, Blue Steam and Osage	×																	
Goats																		
Goats clipped	×						×											
Mohair	×						×		×	×	×				×	×		
Hogs	×	×	×			×	×		×	×	×	×	×	×	×	×		
By age and sex classes, Jan. 1	×																	
Hogs over 6 months, June 1	×																	
Horses:																		
By age classes, Jan. 1	×									×	×							
Lard																	×	
Meat – beef							×										×	
– lamb and mutton							×										×	
– pork							×										×	
– veal							×											
Mules	×		×			×			×	×	×	×	×	×	×	×		
By age classes, Jan. 1	×				×		×											
Sheep and lambs	×						×		×	×	×							
By age and sex classes	×		×				×									×		
On feed for market	×																	
Shorn							×											
Wool, shorn							×											
Wool, pulled in pulleries							×											
Lamb crop, early																		
Milk cows and dairy products																		
Milk cows	×		×			×	×		×	×	×		×	×	×	×		×
Milk								×	×	×	×			×	×	×	×	
For fluid consumption							$X^{1/}$	×	×	×	×							
For specified manufactured products							×	×	×	×	×			×	×	×		

1/

Product	Number on farms	Breeding intentions	Births	Number raised	Inshipments	Deaths	Production	Disposition	Sales	Prices	Value of sales	Commercial slaughter	Farm slaughter	Value of home consumption	Gross Income	Value of production	Stocks	Condition
Butterfat – in milk							X 1/		X	X	X						X	
– in cream							X		X	X	X							
Butter – farm churned							X										X	
– creamery							X											
Cheese, by kinds							X		X	X							X	
Dry milk, by kinds							X		X	X							X	
Evaporated and condensed milk, by kinds							X											
Ice cream							X											
Misc. manufactured dairy products							X										X	
Poultry and poultry products	X	X		X			X	X	X	X	X			X	X	X	X	
Canned poultry	X						X											
Chickens						X												
By classes, Jan. 1	X						X											
Layers on hand Jan. 1							X											
Layers on hand monthly							X			X						X		
Commercial broilers	X						X			X						X		
Hatched in hatcheries							X 2/		X 3/									
Young chickens, selected months	X						X 4/											
Pullets not of laying age, selected months	X						X											
Eggs	X			X			X	X	X	X	X			X	X	X	X	
Dried							X									X		
Frozen							X			X						X	X	
Liquid							X		X									
Turkeys	X	X		X			X	X	X 5/	X	X			X	X	X	X	
Breeder hens, Jan. 1	X					X	X			X								
Hatched in hatcheries							X											
Apiary products																		
Bees – colonies	X						X											
– package							X		X									
– queens							X											
Beeswax							X			X						X		
Honey, by classes							X			X						X	X	

APPENDIX I–8.   STATISTICAL COVERAGE OF FARM PRODUCTS

1/   Per cow and total.
2/   Production reports include eggs set in incubators in broiler areas weekly and eggs in incubators on first of month in all areas.
3/   Includes chicks sold to farmers as well as chicks placed weekly in commercial broiler plants.
4/   Per layer on hand January 1, per layer on hand during year, and total, annually, and per layer on hand and total, monthly.
5/   Also intentions to market current crop reported in August.