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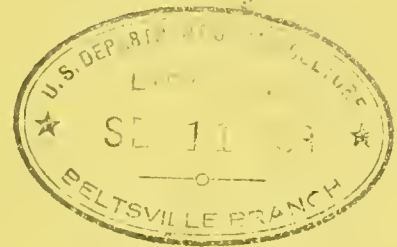
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UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Agricultural Economics

Agricultural Economics Bibliography No. 74



THE SOYBEAN INDUSTRY

A Selected List of References on the Economic Aspects
of the Industry in the United States, 1900-1938

Compiled by
Helen E. Hennefrund and Esther M. Colvin
Under the Direction of Mary G. Lacy, Librarian
Bureau of Agricultural Economics

Washington, D. C.
October 1938

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STATE OF MASSACHUSETTS
DEPARTMENT OF REVENUE

IN SENATE,
January 10, 1911.

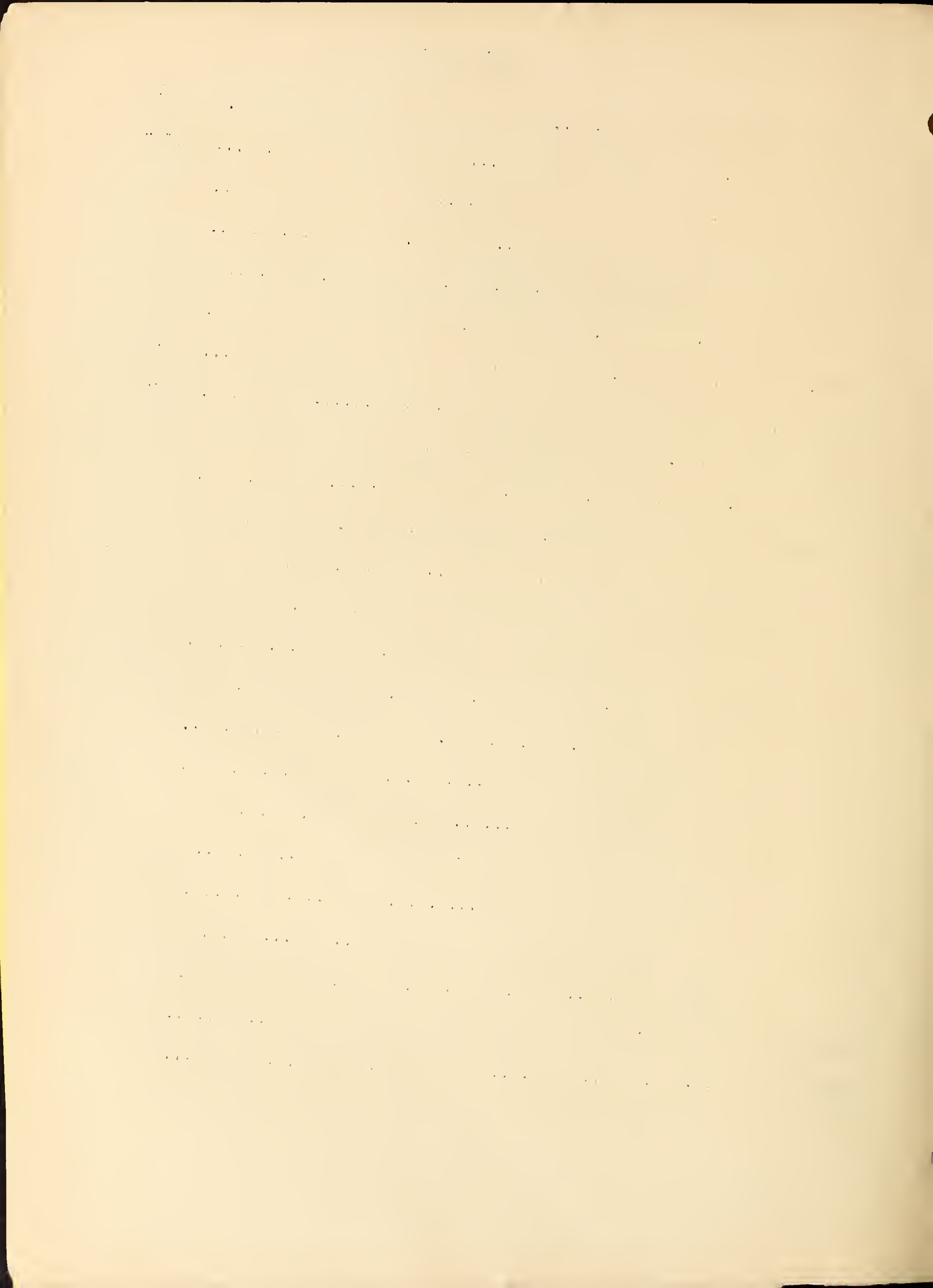
REPORT OF THE
COMMISSIONER OF REVENUE

FOR THE YEAR ENDING DECEMBER 31, 1910.

ALBANY:
PRINTED BY THE STATE PRINTING OFFICE,
1911.

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SOURCES CONSULTED

Card catalogues of the following libraries:

- U. S. Department of agriculture
- U. S. Department of agriculture, Bureau of agricultural economics

Indexes and Periodical Sets:

- Agricultural Economics Literature; issued by U. S. Department of agriculture, Bureau of agricultural economics, Washington, D. C. v. 1, 1927 to v. 12, no. 6, June 1938.
- Agricultural Index; issued by the H. W. Wilson Co., New York. v. 1, 1916 to v. 23, no. 6, June 1938.
- American society of animal production. Record of proceedings of annual meeting, 1908-1937. 389.9 Am3R
- Association of southern agricultural workers. Proceedings of the...annual convention, 2d-38th. 1900-1937. 4 C82
- Chemical Abstracts; published by the American Chemical Society, Easton, Pa. v. 1, 1907 to v. 32, no. 11, June 10, 1938.
- Experiment Station Record; issued by U. S. Department of agriculture, Office of experiment stations, Washington, D. C. v. 11, 1899-1900 to v. 78, no. 6, June 1938.
- Industrial Arts Index; issued by the H. W. Wilson Co., New York. v. 1, 1913 to v. 26, no. 6, May 1938.
- Public Affairs Information Service. Bulletin; issued by Public affairs information service, New York. v. 1, 1915 to v. 24, no. 39, July 2, 1938.
- Society of Chemical Industry. Journal. v. 19, 1900 to v. 57, no. 4, April 1938.

This includes the Review volume, and the Transactions and Abstract volume.

The abstracts section is discontinued with v. 44, 1925, and continued as British Chemical Abstracts. This has been checked from 1926 through April 1938, in Part B, Applied Science.

Bibliographies:

- [Deweese, Anne.] A few references on soybeans and soybean oil (Available in Department of agriculture library) 2pp., type-written. [Washington, D. C.] 1934. Vertical File. Bibliographies (Soybeans)
- Feldkamp, Cora L. Selected list of references on the cost of producing field crops. 9pp., processed. Washington, D. C., U. S. Dept. of agriculture, Office of farm management, 1920. Vertical File. Bibliographies.

- Herb, Mamie I. The soybean industry in the United States.
A selected list of references on the economic aspects of the industry. 19pp., typewritten. [Washington, D. C.] Nov. 6, 1931. Vertical File. Bibliographies (Soybeans)
- LeClerc, J. A. Partial list of references on soybean milk. 4pp., processed. [Washington, D. C.] U. S. Dept. of agriculture, Bureau of chemistry and soils, Food research division, 1936. Vertical File. Bibliographies (Soybeans)
- Miller, Ernest I. Soy beans; a partial bibliography. 18pp., typewritten. Knoxville, Tennessee Valley authority, Technical library, 1935. 173.2 T25So
- Phillips, C. Louise. Abstracts of published material on oil and protein content of soybeans. 7pp., typewritten. [Washington, D. C.] March 1931. Vertical File. Bibliographies (Soybeans)
- Seattle, Wash. Public library. Technological division. Bibliography division. Bibliography on soy beans. 36pp., typewritten. Seattle, March 30, 1930. 241 Sel
- U. S. Department of agriculture, Bureau of chemistry and soils, Food research division. Partial list of references on soy beans and soy bean products. 3pp., processed. Washington, D. C., Dec. 1, 1933. Vertical File. Bibliographies (Soybeans)
- U. S. Department of agriculture. Yearbook of agriculture, 1900-1937. Washington, D. C., 1901-1937.

FOREWORD

This bibliography contains references to material published on the economic aspects of the soybean industry in the United States, from 1900 through June 1938. References have been included to material dealing with the utilization of the soybean in industry, in agriculture, and in nutrition; with the cost of production, harvesting, storing, marketing, and grading; and with the oil, protein and moisture content of the bean.

References on the botany, chemistry and culture of soybeans and on varieties have been omitted except where they have appeared incidentally with other material. Recipes, where food value is not a part of the content; articles on processing methods and refining of soybean oil and the factors affecting them have also been omitted. Works in foreign languages and works published abroad have not been included except where the material relates to the industry in the United States.

A list of patents relating to soybean products and processes has been included. This list is as comprehensive as it was possible to make it from a search made in the U. S. Patent Office under Soybeans and related headings. It is realized, however, that there may be subjects under which such patents might appear which were not checked.

Call numbers following the citations are those of the U. S. Department of Agriculture Library, unless otherwise noted. "Libr. Cong." preceding a call number indicates that the publication is in the Library of Congress.

A request for published reports of proceedings of the National Soybean Oil Manufacturers Association (a phase of the industry now represented by the National Soybean Processors Association) brought the reply that no proceedings had been published. A few abstracts of talks given at the annual meetings were found in the Grain and Feed Journals Consolidated, and are included.

The Soybean Marketing Association has been inactive for the past three or four years, and therefore has no published material available.

The compilers are indebted to Dr. J. W. Hayward of the recently organized Soybean Nutritional Research Council for the statement that the Council "was organized the latter part of 1937 to act as an independent group for disseminating existing knowledge regarding the soybean and its products and encourage further research on same." Acknowledgement of assistance is also made to Mr. W. J. Morse, Bureau of Plant Industry, U. S. Department of Agriculture, to Dr. O. E. May,

Director of the Regional Soybean Industrial Products Laboratory of
the Bureau of Chemistry and Soils at Urbana, Illinois, and to Dr.
J. A. LeClerc of the Food Research Division, Bureau of Chemistry and
Soils, U. S. Department of Agriculture.

Mary G. Lacy, Librarian
Bureau of Agricultural Economics
U. S. Department of Agriculture

October 1938.

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GENERAL

1. Abbott, John B. The soybean in Massachusetts. Mass. Agr. Col. Ext. Leaflet 90, 6pp. Amherst, 1925.
The varieties suited to Massachusetts, and the economic uses of the soybean are among the matters discussed.
2. Adams, G. E. The soy bean. R. I. Agr. Expt. Sta. Bull. 92, pp. 119-127. Kingston, 1903.
"This constitutes a part of the Annual Report for 1902-1903."
A brief history of the bean, a discussion of its culture and its agricultural uses are included.
3. Allis-Chalmers Manufacturing Co., Milwaukee. The versatile soy bean. 18pp. [Milwaukee, Allis-Chalmers Mfg. Co., 1930.] (Bulletin 1246) 60.3 A15
"Allis-Chalmers will attempt to give in this bulletin a resume of the soy bean industry, its growth, possible uses of the oil, general information on seeding, and cultivation; possible profits to the farmer and miller, and a general outline of a milling process which they have developed..." - Preface.
4. American soybean association. Proceedings, 1925/27-1930; 1935-[1937]. [n.p.] 1928-[1937]. 60.39 Am3
1925-1927 are v. 1; 1928-29, v. 2; 1930, v. 3.
1930 is 11th annual business meeting; 1935-[1937] are 15th-17th annual meeting.
Proceedings, 1931-1934 were "not published."
V. 1 (1925-1927, 6th-8th) includes brief reports and programs of the first five field meetings and also condensed reports and minutes of the 8 annual meetings held since 1920:
The Association was founded Sept. 3, 1920 at Camden, Indiana, as the National Soybean Growers' Association, but was not formally organized until its sixth meeting, Dec. 1, 1925, when a constitution and by-laws were adopted, and it became the American Soybean Association.
Partial contents: v. 1. The economic value of the soybean to Southern agriculture, by F. P. Latham, pp. 63-65; Domestic production of soybean oil and oil meal, by I. C. Bradley, pp. 65-69;

Soybeans for human food, by M. F. Deming, pp. 71-76; The development of quality standards for soybeans, by J. E. Barr, pp. 77-83; The economic value of the soybean to Northern agriculture, by J. C. Hackleman, pp. 83-91; Soybeans in hog production, by O. G. Hankins, pp. 91-96; Soybeans in the Eastern States, by Nicholas Schmitz, pp. 98-100; Relation between the soybean grower and the oil mill, by F. A. Wand, pp. 104-106; Seed frauds in soybean varieties, by R. W. Hamilton, pp. 106-110; Community growing, handling and sale of soybean seed, by John T. Smith, pp. 113-114; Soybeans in South Georgia, by W. J. Davis, pp. 114-118; Soybeans in the Mississippi Delta, by W. E. Ayres, pp. 118-121; Small grains after soybeans, by W. E. Riegel, pp. 121-123 [soybeans in crop rotation to reduce production costs]; Putting soybeans on hoof, by Taylor Fouts, pp. 123-126 [soybeans for livestock feeding]; The distribution of soybeans in the United States, by W. J. Morse, pp. 132-137; Producing soybean seed for the oil mills, by C. E. Williams, pp. 137-145; Soybeans for Southern livestock, by G. S. Tomperton, pp. 145-148; Combines for harvesting soybeans and other crops, by John T. Smith, pp. 148-149; Soybeans and corn in the Mississippi Delta, by E. C. McInnis, pp. 150-154; The soybean industry and United States standards, by J. E. Barr, pp. 154-159; The present outlook of the soybean industry in the United States, by W. J. Morse, pp. 167-171; Soybeans as related to pork production in the United States, by E. Z. Russell, pp. 176-182; Soybeans in Indiana (i.e. Soybeans in relation to soil fertility in Indiana) by K. E. Beeson, pp. 182-187; Soybeans in North Carolina (i.e. The soybean's contribution to North Carolina agriculture) by R. Y. Winters, pp. 187-190.

- 4a. v. 2. Soybeans pay in fattening hogs, by C. M. Vestal, pp. 12-13; Soybeans for dairy cattle, by J. H. Hilton, p. 14; Soybeans for fattening lambs, by Claude Harper, pp. 15-17; Soybeans for poultry, by C. W. Carrick, pp. 17-18; The proper place for soybeans in the system of farming, by E. C. Young, pp. 19-21; Harvesting soybeans with the combine, by I. D. Mayer, pp. 21-22; Commercial prospects with soybeans, by Wilfred Shaw, pp. 28, 30-33; The outlet of soybean products, by Roy Chasteen, pp. 33-34; Commercial outlet for soybeans, by Frederick A. Wand, pp. 35-36; Some commercial uses of the soybean, by J. L. Cartter, pp. 44-47; Why grow soybeans, by J. Benj. Edmondson, p. 57; Twenty years with soybeans. Conclusions derived from experience on McHarry Farms, contributed by Charles L. McHarry, William E. Riegel, Lewis J. Withrow, Edmund W. Stafford, James M. Crumbaker, pp. 58-91; Soyland, by Noah Fouts, Taylor Fouts and Finis E. Fouts, pp. 92-97; The Mid-State soybean association and the Dunfield, by The Association, pp. 101-106 [cooperative growing and marketing of soybeans]; Certified seed, by J. Frank Edmondson, pp. 108-109.

- 4b. v. 3. Making the best use of soybeans in hog feeding. 1. Soybean crop has limited use in rations for swine, by W. E. Carroll, pp. 7-15; 2. Objections for fattening swine do not apply to soybean

oil meal, by W. E. Carroll, pp. 16-18; Soybeans for beef-cattle feeding, by H. P. Rusk, pp. 19-29; Making best use of soybeans in feeding dairy cattle, by W. B. Nevens, pp. 30-36; Soybean harvesting machinery, by A. L. Young, pp. 37-44; Costs of growing and harvesting soybeans in Illinois, by R. C. Ross, pp. 46-56; Soybean hay studies, by George H. Dungan, and C. A. Van Doren, pp. 65-68; Soybean insects, by W. P. Flint, pp. 83-85 (Includes Insect control by the use of soybeans); Shrinkage of soybeans and soybean hay and soybean oil paint investigation, by W. L. Burlison, pp. 86-87; Aims and purposes of the Soybean Marketing Association, by J. H. Lloyd, pp. 89-95.

4c. 15th, 1935; The American soybean association, by W. J. Morse, pp. 3-4; Commercial soybean prices, by E. F. "Soybean" Johnson, pp. 5-9; The national crisis facing soybean growers in the United States, by W. E. Riegel, pp. 10-11; overproduction and importation of soybeans; Utilization of soybean oil with special reference to paint, by W. L. Burlison, pp. 12-15, 17; Soybean oil in the foundry, by Lamar Kishlar, pp. 19-20; Processing soybean oil meal, p. 21; Soybeans and soybean products for dairy cows, by J. W. Wilbur and J. H. Hilton, pp. 24-25; Soybeans and soybean oilmeal for pigs, by W. L. Robison, pp. 27-29; Growing soybeans to meet grading standards, by F. E. Robbins, pp. 33-34; Soybeans: Ancient and modern uses, by W. J. Morse, pp. 34-35, 37; The composition of soybean flour from different processes of manufacture; Baking tests and value of soybean flour, by J. A. LeClerc, pp. 39-43; Green vegetable soybeans, by W. J. Morse, pp. 44-45.

4d. 16th, 1936. Research program of the Regional soybean industrial products laboratory, by O. E. May, pp. 3-6; Soybeans and the Farm chemurgic council, by H. E. Barnard, pp. 8-14; Soybeans and soybean flour and the effect of storage conditions upon the composition of soybeans, by J. A. LeClerc and L. H. Bailey, pp. 16-20; Soy beans in the human diet, by M. Dorothea Van Gundy, pp. 22, 24; Feeding soybeans and soybean oil meal, by G. Bohstedt, pp. 25-26, 28; The nutritive value of soybean oil meal as affected by the method of processing soybeans, by J. W. Hayward, pp. 29, 31-32, 34-35; The processing of soybeans, by I. C. Bradley, pp. 37-39; Dust explosion prevention in soybean processing plants, by David J. Price, pp. 40-45; Use of soybean oil in paint, by M. F. Taggart, pp. 47-48; Protecting the American soybean market, by W. E. Riegel, pp. 49-51; Export demand for soybean products, by E. F. Johnson, pp. 53-54; Soybeans in the United States. In relation to world production and trade, by W. J. Morse, pp. 55-56, 58-60.

4e. 17th, [1937] The research program of the Bureau of chemistry and soils on industrial utilization of farm products, by H. T. Herrick, pp. 3-9, (Describes the projects of the Industrial Farm Products Research Division of the Bureau of Chemistry and Soils.); The U. S. Regional soybean industrial products laboratory, Urbana, Ill., by O. E. May, pp. 10-11, (Organization and research program of the

laboratory.); Work of the agronomic and analytical divisions of the U. S. Regional soybean industrial products laboratory, by J. L. Cartter, and R. T. Milner, pp. 12-15, (Objectives and purposes of the work.); Soybean variety studies of the United States Department of agriculture, by W. J. Morse, pp. 16-18; Edible varieties of soybeans; by Sybil Woodruff, pp. 19-22, (Gives best varieties for food use.); Behavior of soybeans as a vegetable crop, by J. W. Lloyd, pp. 23-28, (Results secured with various varieties.); Soybeans and soybean products for beef cattle and sheep, by R. R. Snapp, pp. 29-33; Experiments in time of harvesting soybeans for hay, by W. B. Nevens, pp. 34-36 ("This paper reports the results of three years' investigations dealing with the time of harvesting soybeans for hay."); Soybeans and soybean products in pork production, by Sleeter Bull, pp. 37-43, (Use of soybean seed and soybean oil meal as a feed for hogs.); Recent results in soybean breeding and genetics, by C. M. Woodworth, pp. 44-48; What we know about the fertility value of soybeans, by O. H. Sears, pp. 49-51; (Describes the physical effects of soybeans upon the soil, the biological activity in the soil following soybeans, and the relation of soybeans to the succeeding crop.); Changes in costs and practices in the production of soybeans, by R. C. Ross, pp. 52-57, ("Costs as we shall discuss them represent the total input of labor, equipment, seed, fertilizer and the like used directly in growing and harvesting the crop figured at prevailing rates, plus a charge for the use of land sufficient to cover taxes and interest on the land value..." The future trend of costs is also discussed.); Soybean harvesting studies, by A. L. Young, pp. 58-62, (Traces the soybean harvesting studies and the results obtained from 1930 to the present.); Convention sees Pennsylvania railroad's soybean exhibit car, p. 63.

5. Army, A. C., Brookins, W. W., Hodgson, R. E. Soybeans for Minnesota. Minn. Univ. Agr. Ext. Div. Spec. Bull. 134, 14pp., rev. St. Paul, August 1937.

World production of soybeans, production in the United States, composition and uses of soybeans, results from feeding trials at various experiment stations, varieties and yields per acre, harvesting for hay, and threshing and drying the seed are discussed.

Table 1 gives the acreage of soybeans produced for seed, yields per acre, and December 1 farm price for the period 1932-36 in the states leading in production.

Army, A. C., and Hodgson, R. E. Grow more soybeans in Minnesota. Minn. Univ. Agr. Ext. Div. Spec. Bull. 134, 11pp., rev. April 1935, is an earlier revision of this same bulletin, as is Army, A. C., Crim, R. F., and Hodgson, R. E. Soybeans for Minnesota. Minn. Univ. Agr. Ext. Div. Spec. Bull. 134, 12pp., rev. St. Paul, May 1936.

6. Ayres, W. E. Much feed at little cost. Oats and soybeans will help out. Prog. Farmer, Miss. Valley ed. 39(40): 940. Oct. 4, 1924. 6 So81

This is an account of experiments in planting soybeans and oats at the Delta Experiment Station at Stoneville, Miss., 1922-24. The financial returns and labor requirements for the crop are cited.

7. Barnard, H. E. Soy beans and products - their uses in commercial feeding. Grain and Feed Rev. 25(12): 18-21. August 1936. 280.28 C78

Address delivered before the Forty-eighth Annual Convention of the American Feed Manufacturers' Association at White Sulphur Springs, West Virginia, on June 13, 1936.

Following a brief history of the soybean in this country and the development of the industrial uses of the beans and the growth of the processing industry, the methods of oil extraction are taken up, and the uses of the oil meal in feeding with the conflicting results obtained are given.

Abstract in Grain and Feed Journals Consolidated 77(2): 86. July 22, 1936 under title "Soybeans in Commercial Feeding." 298.8 G762

8. Barr, J. E. Seedsmen and the soybean industry. Seed World 15(2): 18-19. Jan. 18, 1924. 61.8 Se42

The writer points out the rapid development of the soybean industry and the part seedsmen have played in it. The future of the industry is also discussed.

9. Barr, J. E. Soy beans make good cash crop for Indiana farmers. Demand continues greater than supply. Ind. Farmer's Guide 80(4): 89. Jan. 26, 1924. 6 In2

"More soy beans were harvested in Indiana, Illinois, and other corn-belt states last year than ever before. If properly marketed or used they will add several hundred thousand dollars to the farmers' cash income. The greatest net cash return for the crop is what is wanted and to get this result certain conditions have to be met."

Storing soybeans on the farm and selling them as the requirements of manufacturers demand, is suggested for assuring a continuous supply to the mills and a steady market.

10. Beeson, K. E. Soybeans for Indiana farms. Ind. Purdue Univ. Dept. Agr. Ext. Leaflet 151, 6pp. Lafayette, 1930.

The writer brings out the uses of soybeans, the varieties adapted to Indiana, and harvesting methods for hay and seed.

11. Benton, R. H., Jr. Soy bean cultivation. Prog. Farmer (Miss. Valley ed.) 37(11): 250. March 18, 1922. 6 So81

The article includes a passage on harvesting and threshing and the place of soybeans as a forage crop.

12. Biazzo, R. Sulla determinazione del contenuto in olio dei semi oleosi. *Annali di Chimica Applicata* 10(9-10 and 11-12): 130-133. 1918. 385 An7
Gives the factors ordinarily considered in making a commercial quotation of oil seeds, and the method of determining oil content by extraction with the Soxhlet extractor.
13. Biggar, H. Howard. Soybeans - South Dakota's new crop. *Dakota Farmer* 41(7): 429-430. Apr. 1, 1921. 6 D14
The history of the soybean, reasons for its increasing acreage in the United States, and experiences of farmers growing the beans in South Dakota are among the matters discussed.
14. Bill, F. W. Turning soy beans into money. Farmers of Piatt county, Illinois, build co-operative soy bean mill. *Wallaces' Farmer* 48(3): 301. Feb. 23, 1923. 6 W15
The farmers have organized a cooperative company and set up a soybean oil extracting plant at Monticello. "The movement has a double purpose. It is intended to forward the work of replacing an unprofitable crop, oats, by a profitable one. By reducing the oat acreage, and to an extent, that of corn, it is expected to help stimulate the price of those crops."
15. Blackwell, C. P., and Jeffords, S. L. Soy beans. *Clemson Agr. Col., S. C. Ext. Circ.* 36, 12pp. Clemson College, 1922. 275.29 So8F
In cooperation with the U. S. Department of Agriculture, Extension Service.
Part of the circular is given over to harvesting methods and the uses of the crop.
16. Bois, D. Les plantes alimentaires chez tous les peuples et à travers les âges. Histoire, utilisation, culture. 4v. Paris, Paul Lechevalier, 1927-1937. (*Encyclopédie Biologique*, v. I, III, VII, XVII.) 452.8 B63
Fourth edition of *Le Potager d'un Curieux; Histoire, Culture et Usages de 250 Plantes Comestibles, Peu Connues ou Inconnues*, by A. Paillieux and D. Bois.
Vol. I. Phanérogames légumières. Contains a description of the soybean, pp. 120-130, including the history of the plant in various countries, the oil and its uses, the preparation of soybean cheese and soy sauce, the nutritive value of the soybean, the place of the soybean in the culture of various countries including the United States, yields of various varieties, and use as a forage crop.
Vol. III. Plantes à épices, à aromates, à condiments. Shoyu, pp. 153-155, describes soy sauce and its preparation.

17. Bontoux, Émile. Le soja et ses dérivés. *Les Matières Grasses* 4(36): 2195-2199; (37): 2239-2243; (39): 2326-2329; (40): 2364-2366; (41): 2405-2407. April 25-May 25, July 25-September 25, 1911. 307.8 M42
Bibliography, p. 2407.

Among other things, this study of the soybean and its products takes up the history of the plant; its production in various countries; its chemical composition; food products made from it in the Far East; the use of the soy as an oil plant in the Far East, Europe and the United States; physical and chemical properties of soy oil; and its applications and uses in industry.

18. Bottari, Fulvio. La soja: nella storia, nell'agricoltura e nelle applicazioni alimentari ed industriali. 243pp. Torino, Genova, S. Lattes & C., 1923. 60.3 B65

"This volume treats of the origin and history of soy beans, methods and extent of production in different countries, uses for food and feedstuffs, and industrial applications of the crop." - *Expt. Sta. Rec.* 52: 636. 1925.

19. Bressman, E. N. Bet on beans. *Successful Farming* 35(4): 20, 96. April 1937. 6 Sul2

"Soys are rough-and-tumble crops with a record for off-season yields, and they enjoy a constant demand as hay, high-protein feed, human food, and industrial raw materials." Prices brought by oilmeal, amount of soybean oil production in the United States, uses for the oil and meal and prices received for beans are considered.

20. Briggs, George M. Grow soybeans. *Wis. Agr. Col. Ext. Serv. Spec. Circ.* [March? 1920:], [5]pp. Madison. (Grow More Feed Series, No. 2.) 275.29 W75S

Although mainly on cultural methods, this pamphlet includes the reasons for planting soybeans.

21. Brown, B. A. El cultivo de la soja. *La Hacienda* 21(5): 138-141. May 1926. 6 H11

The writer briefly discusses the introduction of the soy in the United States, its adaptation, the use of soys for hay, silage, for pasture and as a green fertilizer, and their cultivation and harvesting.

22. Brown, B. A., and Slate, W. L., Jr. Soy beans in Connecticut. *Conn. (Storrs) Agr. Expt. Sta. Bull.* 129, pp. 255-287. Storrs, 1925.

The writers point out the increased production of soybeans in the United States, their place in Connecticut agriculture, their uses in Connecticut for hay, silage, soiling, seed, pasture and as a green manure, and briefly discuss harvesting.

23. Burger, A. A. Strayer grows soys. Successful Farming 25(5): 5, 28. May 1927. 6 Sul2

This is an account of the twelve-year experience of Bert Strayer of Black Hawk county (Iowa) in growing soybeans. The harvesting and advantages of the crop are described.

24. Burleson, D. J., and McClelland, C. K. Soybeans. Ark. Agr. Col. Ext. Circ. 230, 8pp. Little Rock. 1927.

The varieties of soybeans and their adaptation, yields of hay from different varieties, harvesting seed and yields of seed from different varieties, and the value of soybeans in soil improvement, are among the topics taken up.

25. Burlison, W. L., and Whalin, O. L. Production and utilization of soybeans and soybean products in the United States. Amer. Soc. Agron. Jour. 24(8): 594-609. August 1932. 4 An34P

"Contribution from the Department of Agronomy, University of Illinois, Urbana, Ill. Also presented at the annual meeting of the Society held in Chicago, Ill., November 19, 1931..."

The following summary is given:

"Soybean acreage harvested for beans has expanded rapidly in the United States since 1925, reaching an estimated production of approximately 18,000,000 bushels for 1931. More than half of the acreage grown each year has been cut for hay. The acreage harvested with livestock has not shown any increase since 1927.

"Imports of soybeans and of soybean cake and meal have always been of minor importance. Soybean oil imports represented significant quantities at the close of the World War, however, but have since diminished to negligible amounts as import duties have become effective. The imports of such competing oils as coconut and linseed have been of greatest importance.

"Approximately one-fourth of the soybean oil being utilized in the United States is going into paints and varnishes, another one-fourth is finding its way to the soap kettle, nearly one-fifth is being used in edible products, and about one-eighth is being consumed in linoleum and water-proofing products. The number of commercial products being placed on the market that contain soybeans or soybean products is increasing rapidly. A most encouraging feature of soybean progress has been the research development in utilization of soybeans and soybean products within the last two years and the corresponding expansion in demand along commercial lines."

Numerous statistical tables, illustrating these facts, are included.

26. Burlison, W. L., and Allyn, O. M. Soybeans and cowpeas in Illinois. Ill. Agr. Expt. Sta. Bull. 198, 20pp. Urbana, 1917.

The section on soybeans, pp. 3-15, takes up the soil and climatic requirements of the bean, culture, harvesting, and the results of variety trials for central Illinois (tests made at Urbana, in Champaign county) and for southern Illinois (tests made at Fairfield, in Wayne county).

27. Burlison, W. L. Soybeans gain popularity. They make good in Illinois. Orange Judd Farmer 66(9): 349, 371. Mar. 1, 1919. 6 Orl
The article is chiefly on cultivation of the soybean, but also points out the reasons for the popularity of the crop in Illinois.
28. Burr, R. A. The bean that made Manchuria famous. Chinese produce it; Americans consume it; Japanese control the business. Trans-Pacific 3(4): 57-60. October 1920. 286.8 T68
The author surveys the Manchurian soybean industry, whose largest customer is said to be the United States. He suggests extensive importations of raw materials into the United States as the solution for making the return trip profitable in trade with the Orient, and the investigation of the soybean as an American article of diet.
29. Burt-Davy, Joseph. The soy-bean (*glycine hispida*). Transvaal Agr. Jour. 8(32): 620-626. July 1910. 24 T68
The writer takes up, among other things, the harvesting of soybean seed, returns of seed, its uses for stock feed and human food, and soybeans as green forage, ensilage, hay, and in the rotation.
30. Calland, J. W. What about soybeans? Grain & Feed Rev. 27(3): 9-11. November 1937. 280.28 C78
"Mr. Calland appeared before the fall meeting of the Ohio Grain, Mill & Feed Dealers' Association held at Lima on October 6. This resume of his talk tells of the unceasing increase in soybean production and of the active interest shown by industry toward the soybean and its products." - Ed. Note.
Abstract of the talk also given under title "Soybeans a Coming Crop" in Grain & Feed Jour. Consol. 79(8): 376. Oct. 27, 1937. 293.8 G762
31. Campbell, James T. Growing popularity of soybeans. Farmer's Advocate and Home Mag. 59(1633): 43. Jan. 10, 1924. 7 F22
This article briefly brings out the growing importance of soybeans in the United States, with reference to the Minnesota exhibit of soybeans at the International Live Stock Hay and Grain Show in Chicago. Growing importance of the crop for Ontario is emphasized.
32. Cates, J. Sidney. More soys. Country Gent. 87(8): 10, 16. Apr. 1, 1922. 6 C833
"Many farmers see in the beans a sound new money crop."
"This is one of a series of articles...for the purpose of suggesting to farmers ways of increasing their income."
33. Cates, J. Sidney. The rising tide of soy beans. Country Gent. 90(12): 8, 31. Mar. 21, 1925. 6 C833
The crop is speeding along on a "Gulf-to-Canada sweep."

34. Cauthen, E. F. Soy beans in Alabama. Ala. Agr. Expt. Sta. Bull. 203, pp. 85-103. Auburn, 1918.
Harvesting soy beans, pp. 99-100; Threshing and storing seed, p. 100; Variety tests for seed, pp. 101-103; Soy bean straw, p. 103; Variety test of soy beans for grain and oil, pp. 104-106; Soy beans for hay, pp. 106-107; Variety tests for hay, pp. 107-109; Mixture of cowpeas and soy beans for hay, pp. 109-114; The soy bean as a soil improving crop, pp. 115-117; Comparative yield of grain from soy beans, corn and cowpeas, pp. 117-118.
Cauthen, E. F. Growing Soy Beans in Alabama. Ala. Agr. Expt. Sta. Bull. 202, pp. 79-84. Auburn, 1918 is "a popular edition of No. 203."
35. Clemson Agricultural college of South Carolina, Extension division. Soy beans. Clemson Agr. Col., S. C., Ext. Bull. 22, 15pp. Clemson College, [n.d.] (Farmers' reading course.)
"Prepared by Representatives of this Division in cooperation with those of the S. C. Cotton Seed Crushers' Association."
The bulletin is in the form of a series of questions and answers on soybeans, some of them relating to history and general use; varieties, adaptations and general use; harvesting and yield; and products and by-products.
36. Connecticut Agricultural experiment station, New Haven, Conn. Tests of soy beans, 1914. Conn. Agr. Expt. Sta. Bull. 185, 17pp. New Haven, 1915.
"The field work connected with these tests was planned and carried out by Mr. H. K. Hayes and his assistant, Mr. Hubbell. The chemical analyses were made under the direction of the chief chemist, Mr. J. P. Street. The results have been prepared for publication by the director [E. H. Jenkins]." - Ed. Note.
For a continuation of this work, see Jenkins, E. H., Street, John Phillips, and Hubbell, C. D. Tests of Soy Beans, 1915. Conn. Agr. Expt. Sta. Bull. 191, 14pp. New Haven, 1916.
The paper considers the uses of the crop, the chemical composition of soybean forage grown for the tests, yields of crops per acre, yields of seed and feeding value of the seed.
37. Cook, I. S., and Kemp, W. B. Soy beans - an important West Virginia crop. W. Va. Agr. Expt. Sta. Circ. 20, 19pp. Morgantown, 1915.
Methods of utilizing soybeans - for seed production, silage, pasture and soil improvement -, varieties for special purposes, harvesting for hay and seed, threshing, and the use of soybeans in mixtures are discussed.
38. Cottrell, H. M., Otis, D. H., and Haney, J. G. A new drought-resisting crop - soy beans. Kans. Agr. Expt. Sta. Bull. 92, pp. 19-28. Manhattan, 1900.
Harvesting of the crop, yield, feeding value, cost of production, faults of the bean, fertilizing value, and the profitability of the crop for Kansas are discussed.

39. Cottrell, H. M., Otis, D. H., and Haney, J. G. Soy beans in Kansas in 1900. Kans. Agr. Expt. Sta. Bull. 100, pp. 57-115. Manhattan, 1901.

This bulletin is made up chiefly of reports by farmers of planting tests made during the year. It is said in the conclusion that "a majority of the 292 who reported growing soy beans in 1900 think them a profitable crop, and this with a new crop, in an unfavorable season."

40. Cox, Herbert R. Soybeans for New Jersey. New Jersey Agr. Col. Ext. Bull. 55, 4pp. New Brunswick, 1926.

Reasons for growing soybeans, harvesting them, and their use in mixtures, for silage, for soiling, for seed and grain, and for pastures are briefly outlined.

41. Crane, Helen R. The story of the soya. Sci. Amer. 149(6): 270-272. December 1933. 470 Sci25

This article relates the history of the soybean in the United States, the value of and uses for its oil, its "discovery" in 1917 as a human food and the food elements contained in it, and the various products made from it. The increasing soybean acreage in the United States is pointed out.

42. Cromwell, R. O. Importance of the soybean. Grain & Feed Jours. Consolidated 77(10): 429-430. Nov. 25, 1936. 298.8 G762

"From address...before Agricultural Council of Chicago Ass'n of Commerce."

Describes the increased acreage and production of the soybean in the United States, the methods of removing oil from the beans, the known uses of soybean by-products, uses made of soybeans by 47 companies listed as using soybeans in manufacturing, the United States' foreign trade in soybeans, and the condition of the futures market.

43. Cullison, W. V. The soy bean and commerce. Oil Miller 20(3): 17-18, 20-22. November 1924. 307.8 O15

The history of the soybean, uses for it, methods of oil production, and uses for the oil and meal are brought out. The writer states that

"The demand and market for soy bean products, especially the oil, is here and now. Whether or not this demand will be filled by American grown beans, or by beans and oil imported from Manchuria depends upon the American farmer."

44. Dalbey, Dwight S. The cowpea and soy bean in Illinois. Ill. Agr. Expt. Sta. Circ. 69, 15pp. Urbana, 1903.

A section on harvesting is included, as well as one on the feed and fertilizer value of the crops.

45. Darden, W. B. Allied Mills soybean plant dedicated. Flour & Feed 34(9): 22. February 1934. 298.8 F66
The plant of the Allied Mills, Inc. at Portsmouth, Va., is described, and the history of the company outlined. The financial possibilities of the crop are brought out.
46. Davis, Glen D. Soy bean is profitable Texas crop. Eight years of research prove Asiatic legume is adapted to southern soils and climate. East Texas Chamber Com. East Texas 9(12): 6, 26. September 1935. 6 Ea73
"As a commercial crop the soy bean offers a splendid opportunity to East Texas, not only because it restores nitrogen to worn-out cotton land, and because it can be used either as a food or feed crop, but because it possesses tremendous cash sale possibilities."
47. Davis, Glen D. Soy bean meet held at Corsicana. East Texas Chamber Com. East Texas 10(4): 7, 16. February 1936. 6 Ea73
Includes brief outlines of speeches delivered by A. G. Pat Mayse, H. H. Williamson, H. E. Barnard, E. B. Reynolds, H. A. York, J. I. Morgan, B. B. Hulsey, L. E. Robinson, and Landon C. Moore.
48. Dearborn conference of agriculture, industry and science, Dearborn, Mich., 1935. Proceedings of the Dearborn conference of agriculture, industry and science, Dearborn, Michigan, May 7 and 8, 1935. 256pp. [Dearborn, Mich., Farm chemurgic council; New York, The Chemical foundation, 1935.] 281.9 J66 1935
Partial contents: Increasing the use of agricultural products in the automotive industry, by R. H. McCarroll, pp. 57-63. (Describes the use of soybeans in the Ford plant, and its importance to the farming industry. A discussion follows this paper, pp. 63-65.); Cooperation between agriculture and industry, by Earl C. Smith, pp. 70-81. (Mention is made of the outlet in industry for surplus soybeans.)
49. Dearborn conference of agriculture, industry and science, Dearborn, Mich., 1936. Proceedings of the second Dearborn conference of agriculture, industry and science, Dearborn, Michigan, May 12, 13, 15, 1936. 409pp. [Dearborn, Mich., Farm chemurgic council; New York, The chemical foundation, 1936.] 281.9 J66 1936
Running title: Second Dearborn Conference.
"Under the sponsorship of the Farm chemurgic council and the Chemical foundation, inc."
Partial contents: Soy beans as a farm crop, by E. D. Funk, pp. 243-247 (contains a section on United States production and imports); The processing of soy beans, by Clark Bradley, pp. 248-250; The rôle of soy bean oil in paint formulation, by E. E.

Ware, pp. 250-254 (Abstract under title "Soybean Oil in Paints." *Chem. Indus.* 38(6): 598. June 1936. 381 C426); Soy bean proteins, by W. J. O'Brien, pp. 254-260 (includes a chemical analysis of soybean protein, oil and meal extraction experiments, commercial importance of soybean protein in various industries. Also in *Oil and Colour Trades Jour.* 90(1987): 1434-1436, 1442. Nov. 13, 1936. 306.8 O152. Abstract in *Chem. Indus.* 38(6): 593-594. June 1936. 381 C426); Soy bean chemistry, by H. R. Kraybill, pp. 260-265 (from an industrial point of view); Mixing soy bean oil and tung oil, by M. F. Taggart, pp. 265-267.

50. Dearborn conference of agriculture, industry and science, 3d, Dearborn, Mich., 1937. Proceedings. 182pp. Dearborn, 1937. (*Farm Chemurgic Journal*, v. 1, no. 1, September 1937) 381 F22 v. 1, no. 1. "Soy Bean Committee", pp. 166-169. This is the report of the Soy Bean Committee. A report, "Soy Bean Products", submitted to the Committee at its annual meeting at Dearborn, Mich., May 25, 1937, by E. F. Johnson, is included, pp. 167-169. In it, statistics are given as to the utilization of the commercial soybeans, and the production capacity of processing plants. The Committee report is reprinted in two articles by E. F. Johnson, "Statistics of Soybean Industry" in *Grain & Feed Jour. Consol.* 78(12): 544. June 23, 1937, and "Soybean Oil Mill Capacity", in *Grain & Feed Jour. Consolidated* 78(12): 547. June 23, 1937. 298.8 G762
51. Descartes de G. Paula, Ruben. A soja como materia prima para industria. 20pp. Rio de Janeiro, Instituto Nacional de Tecnologia (Ministerio do Trabalho, Industria e Comercio), 1937. 60.3 D45
Text in Portuguese with résumé in French.
The writer brings out the importance of the soybean in the general economy and especially as a raw material for industry. The possibilities of the crop for Brazil are considered, and brief studies are made of the chief products of the soybean: oil, cake, flour, lecithin, and casein.
52. Dickey, J. B. R. Soybeans, cowpeas and Canadian field peas. N. J. Agr. Col. Ext. Bull. 23, 23pp. New Brunswick, 1919.
The section on soybeans, pp. 4-18, includes discussion of the purposes for which they may be grown, harvesting the crop, and practical experiences of New Jersey farmers with soybeans.
53. Dickey, J. B. R. Soybeans in Pennsylvania. Pa. Agr. Col. Ext. Leaflet 36, 4pp. November 1935.
Expected yields and value of growing soybeans, harvesting for hay and seed, and feed value of the ground threshed beans are briefly mentioned.

54. Dies, Edward Jerome. Soy, the midwest's miracle bean. Commerce 53(5): 27-28. June 1936. Libr. Cong. HF1.C4
Increasing acreage of the soybean, establishment of the soybean research laboratory at the University of Illinois, food and industrial uses for the bean, growth of the industry in the United States, and the need for tariff protection are discussed.
55. Dimmock, F., and Kirk, L. E. Soybeans. Canada Dept. Agr. Pamphlet (n.s.) 155, 18pp. Ottawa, 1934. 7 C16Pa
"Since the soybean is comparatively new as a farm crop in Canada this pamphlet is intended to give information as to the characteristics of the soybean plant and seed; its adaptation to soil and climatic conditions; the various purposes for which soybeans are used; the most suitable varieties that are available; and general instructions on how the crop should be grown and handled."
56. Dorr, Carl. Soybean mills will stimulate market. Establishment of mills in Iowa may provide outlet for surplus soybeans. Wallaces' Farmer 52(20): 744, 747. May 20, 1927. 6 W15
"It is probable that there may be several soybean process mills established in Iowa for the purpose of extracting the oil out of the soybean - oil which is worth 10 cents per pound, according to Dr. O. R. Sweeney... The residue after the extraction of the oil can be readily made into soybean oil meal, which is extremely useful as a feed for hogs, cattle (dairy and beef), sheep and poultry, according to the experiments carried out by the various college experiment stations."
57. Dorsey, Henry. Growing soybeans. W. Va. Agr. Col. Ext. Circ. 204, 8pp. Morgantown, 1918.
Contains sections on the importance of the crop, harvesting, yields, suitable varieties, special uses, use for human food, and in crop rotations.
58. Ducceschi, Virgilio. La soja e l'alimentazione nazionale. 246pp. Milano [etc.], F. Vallardi, 1928. (Biblioteca enciclopedica Vallardi) 389 D85
Bibliography, pp. 240-246.
This study on the soybean and its place in national feeding has chapters on the natural history of the soybean with its various applications in rural economy, in human nourishment and in industry; the chemical composition of soybean grain; the biological value of the chief nutrients contained in the grain; food products furnished by the soybean and their digestive utilization; medical applications of the soybean; and the economic problem of the soybean, its value as a cheap source of protein, and yields under cultivation as compared with other grains.

59. Duck, R. W. Growing soy beans in the East. Rural New Yorker 92 (5274): 626. Dec. 23, 1933. 6 R88
References at end of article.
Contains sections on handling and harvesting the beans, suitable varieties, and value as a livestock feed.
60. Dugard, Jean. La valeur alimentaire et industrielle du soja. Le Génie Civil 100(17): 419-420. April 23, 1932. 290.8 G29
This is based in part on material from Farmers' Bulletins 1617, 1605 and 1520, and on M. R. Gouin's article in Journal d'Agriculture Pratique, Dec. 12, and 19.
The author takes up composition and food value of the soybean, products from the soy eaten by man, the use of the soy as forage, and industrial uses for the oil and cake.
61. East Indies (Dutch). Departement van landbouw, nijverheid en handel, Afdeeling landbouw. Kedelee. 195pp. Buitenzorg [1932] 60.3 Ea7
Literatuur, pp. 173-174.
Summaries of the papers contained in this volume are given in English, pp. 175-[196].
Partial contents: Over de beteekenis van de sojaboon als handelsproduct, by D. F. Blokhuis en E. R. Von Liebenstein, pp. 5-31. (Eng. The commercial significance of the soybean, pp. 177-178); De voedingswaarde der sojaboon en enkele daaruit bereide specifiek Indische voedingsmiddelen, by W. F. Donath, pp. 139-173. (Eng. The food value of the soybean and some specifically East Indian articles of food prepared from them, pp. 193-195).
Also published as the Kedelee or soybean number of Landbouw; Tijdschrift der Vereeniging van Landbouwconsulenten in Nederlandsch-Indie 7(9): 569-766. March 1932. 22.5 L23
62. Eastman, W. H. Exporters taking soy beans away from U. S. mills. Grain & Feed Jours. Consolidated 69(9): 432. Nov. 9, 1932. 298.8 G762
Abstract of speech before the National Soybean Oil Manufacturers Association.
The writer points out the higher price obtained for soybeans in the European than in the domestic market, and concludes that "unless there is a demand for the products at substantially higher price levels the domestic oil milling industry may be forced to close down and let the European mills crush our soy beans for us..."
63. Edmondson, J. B. Soy beans and permanent agriculture. Purdue Agr. 18(4): 63, 80. January 1924. 6 P97
"By all counts, I believe the best program for the Indiana farmer today is to build on a four-year rotation of corn, soy beans, wheat and clover, both from the standpoint of profits and the future welfare of the soil." The uses for the crop and commercial market are brought out.

64. Etheridge, W. C., and Helm, C. A. Productive methods for soybeans in Missouri. Mo. Agr. Expt. Sta. Bull. 195, 32pp. Columbia. 1922.
Partial contents: Ten reasons why soybeans are popular in Missouri, pp. 3-5; Superior varieties of soybeans for some of the important sections of the State, together with their descriptions and the time they require for maturing, pp. 5-16; How to harvest, thresh and store soybean seed, pp. 25-28; The usefulness of the soybean hay crop, p. 28; The value of soybeans in rotation with corn, wheat and clover, p. 32.
65. Evans, Arthur T., and Fowlds, Matthew. Soybeans in South Dakota. S. D. Agr. Expt. Sta. Bull. 193, pp. 317-324. Brookings, 1921.
An account of the importance of the soybean, its uses, and its varieties. Yields of soybean varieties for seed are given, 1914-1920, and yields of soybeans for hay, 1915-1920.
66. Everyman's legume - the soybean. Dairy Farmer 20(5): 110, 123. March 1, 1922. 44.8 K56
"For the renter who cannot wait for clover, for the man short of legume feeds and for those who expect to reduce their corn acreage, there is the soybean." Soybeans as a cash crop, and soybeans for feed and silage are briefly discussed.
67. Evvard, John M. Soybean's popularity ascending. Flour & Feed 35(1): 19. June 1934. 298.8 F66
Increasing soybean production in Iowa and other states mentioned. Also in Grain & Feed Jours. Consolidated 72(12): 535. June 27, 1934. 298.8 G762
68. Fain, John R., and Vanatter, P. O. Soy beans and cowpeas. Ga. Agr. Col. Ext. Circ. 46, 8pp. Athens, 1917.
The section on soybeans takes up briefly their history, description, uses for food and oil, for seeding in corn, for hay, for silage, and as a grazing crop for hogs, soil requirements, drought resistance, varieties, and methods of harvesting.
At the end of the article there is a comparative analysis of soybean and cowpea grain and hay.
69. Farmers crushing their own beans. Orange Judd Farmer 71(14): 375. July 15, 1923. 6 Orl
A new association "known as the Piatt County Cooperative Soy Bean Company, has just completed the building of an up-to-date, thirty-five thousand dollar crushing plant near Monticello, Illinois, and expects to handle a good share of the bumper soy bean crop which Central Illinois is now grooming for the late summer market, as well as handling the surplus beans which farmers do not find ready sale for in that locality."

70. Farver, Warner E. More soy-bean hints. Natl. Stockman and Farmer 43(9): 253-254. May 31, 1919. 6 N21
Advantages of soybeans because of their suitability for late planting and the resistance of the hay crop to rain.
71. Ferris, E. B. Soy beans for south Mississippi. Prog. Farmer (Miss. Valley ed.) 38(8): 210. Feb. 24, 1923. 6 So81
The writer finds that soybeans give better returns in this section than cowpeas. Varieties are discussed and methods of cultivation brought out.
72. Figure on a patch of soy beans. This crop has proven its worth in Illinois in recent years. Orange Judd Farmer 72(2): 36. Jan. 15, 1924. 6 Orl
"This comparatively new crop is fast proving itself a valuable crop on the general purpose farms in Illinois, and if you have been losing money on oats, or have a larger acreage of oats than you knew what to do with, it might be worth while to look up something about soys before spring work comes on."
73. Flumberfelt, W. E. Soybeans, a link between agriculture and industry. Grain & Feed Jours. Consolidated 78(10): 428. May 26, 1937. 298.8 G762
Abstract of address before Western Grain & Feed Dealers' Association.
The methods of processing the beans are described. The writer concludes: "All must teach the farmer the values of soybean oil-meal, and tell him that 80% of this soybean is meal, that if he wants a high price for his soybeans he must help make a good market for the meal."
74. El frijol que se ha hecho famoso. Revista de Agricultura [Cuba] 20(4-5): 30-36. April-May 1937. 8 Ag88Re
"Vertido al Castellano por Rafael Gutierrez Marin, traductor de la Secretaria de Agricultura."
This article describes the soybean, its history in the United States, the advantages of planting it, its uses as oil and vegetable milk, its use in industry, and prospects for the future.
75. Gaskill, E. F. The soy bean. Mass. Agr. Col. Ext. Circ. 56, [3]pp. Amherst, 1918.
Includes a brief discussion of soybean uses, and the advisability of growing the beans in Massachusetts.
76. Graber, L. F. Soy beans, a self fertilized seed crop on sandy soils. Hoard's Dairyman 59(11): 679, 691-692. April 2, 1920. 44.8 H65
"Soy beans have produced in Northern Wisconsin as much as one hundred cold, grey, jingling dollars an acre and a cash income of from forty to sixty dollars an acre has not been, during the past year, by any means unusual and often these profits have accrued on land worth less than the crop itself..."

Soybeans as soil builders, harvesting the crop for seed, and the scarcity of soybean seed are brought out.

77. Granato, L. A soja. São Paulo Secretaria de Agricultura, Comercio e Obras Publicas, Boletim de Agricultura ser. 14, no. 3; pp. 159-167. March 1913. 9.2 Sa63
"Data are given regarding the botanical characteristics, the composition and food value, and the uses of the soy bean." - Expt. Sta. Rec. 29: 865. 1913.
78. Grantham, Arthur E. The soy bean - its promise as a farm crop. Pract. Farmer 116(4): 70-71. Feb. 15, 1920. 6 P88
The history and description of the soybean, its uses, its future as a permanent crop in our agriculture, its market value and its harvesting are included in this article.
79. Grantham, Arthur E. Soy beans. Del. Agr. Expt. Sta. Bull. 96, 39pp. Newark, 1912.
The adaptability of soybeans to Delaware conditions, methods for utilizing the beans, soybeans in the crop rotation, yields of seed and hay per acre for different varieties, harvesting and curing the hay and harvesting and threshing for seed, storage of the seed, soybeans as a source of oil and protein, and soybeans compared with cowpeas are discussed.
80. Gray, George Douglas. All about the soya bean in agriculture, industry and commerce; with an introductory chapter by James L. North. 140pp. London, John Bale, sons & Danielsson, ltd. 1936.
60.3 G79
Bibliography, pp. 136-137.
Contents. - Introduction. Ch. I. Introducing the soya bean, pp. 10-21; II. The soya bean plant and its cultivation, pp. 22-45; III. The soya bean as food, pp. 46-69; IV. Soya bean oil, pp. 70-92; V. Soya bean trade, pp. 93-110; VI. The soya bean in agriculture, pp. 111-119; Addenda, pp. 120-138.
Frequent reference is made to the United States in the text. The Addenda contains a list of the soybean products exhibited by the American Soybean Association, recipes and statistics. These statistics include the amount of imports of soybeans made by the United States; and tons of soybeans produced in the United States during 1933, 1934, and 1935.
81. Grove, Ernest W. Soybeans in the United States; recent trends and present economic status. U. S. Dept. Agr. Tech. Bull. 619, 31pp. Washington, D. C., 1938. 1 Ag84Te
Selected list of references, pp. 29-30.
This study includes the development of the soybean industry in the United States and the relation of the United States to the world market for soybeans, soybean production in the United States,

the amount of beans used for crushing, and the uses for the oil, and meal, the factors affecting the price of soybeans, the present economic position of the bean and its products.

There are the following tables: 1. Production of soybeans in specified countries, 1925-36; 2. Imports of soybeans, soybean oil, and soybean cake and meal, United States, 1912-36; 3. United States tariff rates on soybeans, soybean oil, and soybean cake or meal, 1913-37; 4. Soybeans: Acreage for hay, beans, and grazed or hogged-off, United States, 1924-37; 5. Soybean production, quantity crushed, exports, change in stocks, quantity used for feed or seed, and average farm price, 1924-37; 6. Factory consumption of soybean oil, by classes of products, 1931-36; 7. Factory production, net imports, stocks, and disappearance of crude soybean oil, 1922-36; 8. Production of soybean, cottonseed, and linseed oils in the United States, average 1928-32, annual 1933-36; 9. Production of high-protein feeds in the United States, average 1928-32, annual 1933-36; 10. Value of soybean oil and meal produced per bushel of soybeans, farm price, and spread between farm price and total value, United States, October 1933-September 1937; 11. Average price per pound of soybean oil, linseed oil, and cottonseed oil, in tank carlots, specified localities, by months, 1929-36; 12. Average price per ton of soybean meal, cottonseed meal, and linseed meal, bagged, specified markets, by months, 1929-36; 13. Total acreage, acreage harvested for beans, yield per acre, and production of soybeans in the United States, and selected regions and States, 1924-37; 14. Total acreage, acreage harvested for hay, acreage grazed or hogged off, acreage harvested for beans, yield per acre, and production of soybeans in the United States, and selected regions and States, 1924-37.

82. Growth of the soya bean industry in America and its effect on the Malayan copra and palm oil trade. *Malayan Agr. Jour.* 22(3): 141-142. March 1934. 22.5 F312

"If the importation of copra and oil palm products into the United States is restricted in order to encourage home production of oil-producing crops, it is not improbable that the demand for coconut and oil palm products in the United States will in the future tend to diminish."

83. Guard, Samuel R. Soybeans in a cornbelt rotation. *Breeder's Gaz.* 77(2, whole no. 1988): 67-68. Jan. 8, 1920. 49 B74

Describes methods used by William E. Riegel on the C. L. Meharry farm in Champaign, Illinois. Harvesting for hay and seed, yields, effect of soybeans on corn yield when they are planted in combination, and the dependence upon the hog market outlook of methods of harvesting corn and soybeans are mentioned.

84. Hackleman, J. C. Growing soybeans in Illinois. *Ill. Agr. Expt. Sta. Circ.* 255, 16pp. Urbana, 1922.

Includes directions for harvesting and threshing, and a description of the varieties of soybeans adapted to various uses.

85. Hackleman, J. C. La soja y sus multiples usos. La Hacienda 33(1): 6-9; (2): 53-55. January-February 1938. 6 H11

The author discusses the increasing soybean production in the United States, the reasons for it, the value of the soybean in crop rotations, its use as a soil improver, and harvesting for hay and seed. A table shows the numerous uses for the soybean and its oil and meal.

86. Hackleman, J. C., Sears, O. H., and Burlison, W. L. Soybean production in Illinois. Ill. Agr. Expt. Sta. Bull. 310, pp. 465-531. Urbana, 1928.

Literature cited, p. 531.

"With hundreds of farmers annually trying out soybeans for the first time, with the increased interest in the crop resulting from continued economic difficulties with the oat crop, and the threatened invasion of the corn borer, problems regarding the soybean are constantly coming up with renewed vigor. Farmers wish to know the various uses to which the new crop can be put, its adaptation to their sections of the state, and particularly urgent is the demand for recommendations regarding suitable varieties and the details of cultural practices.

"This bulletin is therefore issued principally to report the results of variety trials which have been under way on the University South Farm at Urbana for about twenty years and on the northern Illinois experiment field at DeKalb for five years. The most recent information available on other points of interest is also included in order that farmers and others may have a good basis for arriving at a correct evaluation of the crop." - p. 467.

An anonymous article based in large part on this bulletin is entitled "Harvesting and threshing soybeans." Amer. Thresherman 31(4): 9. August 1928. 58.8 Am32

87. Hall, F. H. Soybean and cowpea. N. Y. (State) Agr. Expt. Sta. Circ. 45, 6pp. Geneva, 1915.

Included in the paper are a description of the general character of the soybean, its uses and value, and yields and feeding value.

88. Heaton, E. B. Making the farm feed the cow. Orange Judd Farmer 67(20): 748-749. Nov. 15, 1919. 6 Or1

The author briefly sketches the history of the soybean, its value as human food, its use with corn for silage, and cultural methods.

89. Hedgson, Emory R. Ten lessons on soy beans and cow peas. Va. Agr. Col. Ext. Bull. 55, 26pp. Blacksburg, 1919. (Boys' and girls' agricultural and home economics club series)

Utilization of the crop, and profits from it; harvesting;

value and yield of seed; feeding value; use as human food and for oil and meal; and soybeans as hay, pasture, a soiling crop and ensilage are discussed in the lessons.

90. Herman, V. R. Soybeans and cowpeas for North Carolina. N. C. Agr. Expt. Sta. Bull. 241, 40pp. Raleigh and West Raleigh, 1919.

The section on soybeans contains information on the history of the soybean, the comparative feeding value of various hays including soybean hay, the production of soybeans for seed, soybeans as summer pasture, and soybeans as an improver of the soil. The last section contains a brief comparison of soybeans and cowpeas for seed and hay production.

91. Holman, R. L. A new variety of soybeans. Marshall county, Tennessee makes a hit with Laredo beans. Dairy Farmer 23(4): 13, 26-27. Feb. 15, 1925. 44.8 K56

Increased yields from the crop of this variety are brought out. Farmers who harvested a seed crop in 1924 formed the Laredo Bean Growers' Association for the pooling of their seed for sale when the demand comes.

92. Horvath, A. A. The soybean points the way to agricultural recovery. Sci. Monthly 43(1): 63-69. July 1936. 470 Sci23

"It seems evident that to-day the soybean is one of the most promising agricultural plants for an almost unlimited variety of industrial uses, most of them non-competing with existing domestic products, and as such offers the broadest outlook for making farming a paying proposition. The cultivation of soybeans as a cash crop has every chance to expand far beyond the existing commercial level, which will no doubt create numerous new industries and by this do its share in relieving unemployment. The soybean thus seems to point towards a practical and constructive way for many a crop which, through the lasting efforts of all concerned, may lead to the ultimate well-being of the farmer, the workman and the business man alike."

93. Houston, D. F. Cowpeas and soy beans. Hoard's Dairyman 53(15): 641. May 4, 1917. 44.8 H65

This is a brief summary by the Secretary of Agriculture of the value of soybeans for oil production and human food, and the shortage of supply.

94. Hughes, H. D., and Wilkins, F. S. Soy beans in Iowa. Iowa Agr. Expt. Sta. Circ. 65, 41pp. Ames, 1920.

Contains a brief section on the importance of soybeans, and one on harvesting them.

95. Hulbert, H. W. Soy bean meal. Flour & Feed 31(12): 27. May 1931. 298.8 F66

The uses of the soybean in the United States, its high protein content, and its great value as a hog feed, are among the matters taken up.

96. Hulbert, H. W., and Spence, H. L. Soybean production in Idaho. Idaho Agr. Expt. Sta. Bull. 218, 13pp. Moscow, 1935.
History of the soybean, p. 4; Varieties for northern Idaho, pp. 4-6; Utilization of soybeans, pp. 7-8; Soybean oil, pp. 8-9; Feeding value of soybeans, pp. 9-10; Soybean hay, p. 13; Harvesting for seed, p. 13.
97. International institute of agriculture. Le soja dans le monde. 282pp. Rome, [Imprimerie de la Chambre des députés - Charles Colombo], 1936. 60.3 In82S
Bibliography, pp. 276-282.
Part B. takes up the various uses of the soybean as human food, uses for the oil, use of the bean in the feeding of domestic animals, and its use as a manure. Part C. discusses commerce in the soybean and its products, soybean production in various countries including the United States, the economic importance of soy culture in the United States, sale prices of soybeans, 1930-1935, and net cost.
98. Invading bean: soya crops exported from America give Japanese case of jitters. Lit. Digest 122(6, whole no. 2416): 14-15. Aug. 8, 1936. 110 L
The increase in American production of soybeans and their exportation at lower prices than the Manchukuo product are discussed. The uses for the crop in American industry are brought out, and it is said that "Manchukuo's production has dropped from 5,227,000 tons in 1931 to 3,822,000 tons in the last twelvemonth; and even tho America's invasion of the world market may be, as the Japanese hope, only temporary, it has shaken them terribly."
99. Iowa farmers and the soy bean. Growers of soy beans are finding out how best to grow and use the crop. Wallaces' Farmer 48(15): 581. Apr. 13, 1923. 6 W15
This is a report of the experiences of farmers with soybeans. Uses for the crop are brought out.
100. Itié, G. Le soja, sa culture, son avenir. L'Agriculture Pratique des Pays Chauds. Bulletin du Jardin Colonial 10(82): 37-49; (83): 137-144; (84): 231-246; (85): 305-307; (93): 485-493; 11(94): 55-61. January-April, December 1910; January 1911. 26 Ag81
Includes (1st installment) the history of the crop in various countries, (2nd) a chemical analysis of various parts of the soybean plant, (3rd and 4th) harvesting for green fodder and seed and threshing, and (5th and 6th) soybeans in mixtures and in the crop rotation. Yields are given, based in part upon figures given by United States experiment stations.
101. Itskov, ... Mekhanizatsiia i agrotekhnika soi... 46pp. [Moskva] 1931. 60.3 It6
At head of title: Itskov, Ageev, Vainman.

The mechanization and agrotechny of soybeans. Study includes material on the harvesting of the beans with combines, and the storage of the crop. Reference is made to work done in this field in the United States and other countries.

102. Jackson, A. D. Soybeans not adapted to southwestern climate. Grain & Feed Jours. Consolidated 76(6): 238. March 24, 1936. 298.8 G762

"The Corsicana Soybean Conference, sponsored by the East Texas Chamber of Commerce, was a most important meeting and one calculated to gradually develop the soybean as one of the crops to substitute or replace acreage released from cotton. The sense of the conference was universally, that in the promotion of this crop, the procedure should avoid a mushroom growth and should follow along the lines that would permit of sound development...

"Dr. E. B. Reynolds, of the Texas Experiment Station presented results to the conference, showing that, over a period of years, the production of soybeans at the several substations has not been high...

"It should be borne in mind that there is abundant authoritative information from the Experiment Stations here in Texas to show that soybeans will not yield profitable crops year in and year out..."

103. Jamieson, George S. Vegetable fats and oils. 444pp. New York, The Chemical catalog co., inc., 1932. 307 J24

Ch. IV. Drying Oils, pp. 225-285, includes a section on soybean oil, pp. 261-269. In it are brought out the history of the soybean, yields in various countries, importance and production in the United States, harvesting and storage of the beans, methods of manufacture of the oil and meal in the United States, the chemical characteristics of soybeans and soybean oil, and the uses of soybean oil.

References included in the text; those for this passage are given on pp. 268-269.

Ch. VI. Methods, pp. 321-407, describes, pp. 397-398, the method of refining crude soybean oil.

104. Jardine, W. M. The year in agriculture. The Secretary's report to the President. U. S. Dept. Agr. Yearbook, 1926: 1-120. Washington, D. C., 1927. 1 Ag84Y

Soybean acreage and seed value, p. 66.

105. Jeter, F. H. Soy beans - a valuable crop. Amer. Fertilizer 56(11): 81-82. June 3, 1922. 57.8 Am3

Briefly discusses the growing importance of soybeans, harvesting the beans, and the average yield to be expected.

106. Johnson, E. F. Commercial growing of soybeans. Purdue Agr. 11(1): 17-21, 45. October 1916. 6 P97

Methods of handling and harvesting the crop on the Johnson Seed Farms at Stryker, Ohio, are described.

107. Johnson, E. F. Keeping up with soybeans. Grain & Feed Jours. Consolidated 76(6): 243. March 24, 1936. 298.8 G762
The rapid increase in the production of soybeans in this country, the soybean market, prices and uses for the crop are outlined.
108. Johnson, E. F. Soybean acreage expanding. Grain & Feed Jours. Consolidated 74(3): 112. Feb. 13, 1935. 298.8 G762
"There is every indication now of a decided increase in the soybean acreage next year. In those sections, ravaged by drouth and chinch bugs, where corn was almost a total failure, yields of soybeans from 20 to 40 bus. per acre were common. Present prices, around a dollar per bushel to the grower, together with the success of the crop under adverse conditions, will result in a large increase in many sections."
109. Johnston, Ralph E. Soybeans in South Dakota. Breeder's Gaz. 80 (23, whole no. 2087): 846-847. Dec. 8, 1921. 49 B74
Describes experiences with soybeans related by people at the first annual soybean day in Clark County, South Dakota.
110. Johnston, Ralph E. Soybeans in South Dakota. S. Dak. Agr. Col. Ext. Leaflet 27, 4pp. [Brookings] 1923.
Uses of soybeans, threshing of the crop, and varieties for various uses, are briefly mentioned.
This is also printed under title "Grow soybeans in South Dakota." Dakota Farmer 44(6): 291. March 15, 1924. 6 D14
111. Jordan, Sam. Corn in Missouri; also soybeans and cowpeas. Mo. State Bd. Agr. Monthly Bull. v. 19, no. 11, 47pp. Jefferson City, November 1921.
"Soybeans - 40 questions and answers", pp. 37-47, has some material economic in character.
The same section, with a few minor changes in wording appears in Mo. State Bd. Agr. Monthly Bull. 15(6): 20-28. Columbia. June 1917.
112. Kaltenbach, D., and Legros, J. Soya: selection, classification of varieties, varieties cultivated in various countries. Internatl. Inst. Agr. [Rome] Monthly Bull. Sci. and Pract. Agr. 27(4): 117T-149T; (5): 165T-189T; (6): 216T-233T; (8): 281T-297T. April-June, August 1936. 241 In82
In the first and second installments of this study, pp. 128T-149T; 165T-175T, there is a discussion of the varieties cultivated in the United States, with attention to the acreage of soybeans in the United States, the uses of the crop, and the characteristics of the varieties cultivated, as well as the varieties cultivated in each of the chief soy producing states.
Tables include "Yields and utilisation of the principal soya

varieties cultivated in Massachusetts"; p. 167T, "Seed production of the principal soya varieties cultivated in Ohio (in bushels per acre)", p. 168T, "Production (in bushels per acre) of soya varieties, studied at the Experiment Station of Delta, Stoneville, compared with 5 Standard varieties (in 1934)", p. 170T.

113. Kansas Agricultural experiment station, Farm department, Manhattan. Soy-beans. Kans. Agr. Expt. Sta. Bull. 99, pp. 20-22. Manhattan, Sept. 25, 1899. (Press Bull. 46)
Bulletin 99 is a reprint of Press Bulletins 35-70.
Contains method and cost of harvesting and cost of production of 60 acres of soybeans on the College Farm.
114. Kempner, Adolph. The soybean (soja max). Grain & Feed Jours. Consolidated 74(1): 20-21. Jan. 9, 1935. 298.8 G762
"In the map, tabulations, and text herewith the Rosenbaum Grain Corporation has assembled the latest data on production, exports, uses, varieties and salient facts about that coming crop, the soybean.
"The compiler, Adolph Kempner, with clear vision, sees in the future a material increase in demand for human consumption."
115. Kempski, Karl E. Die sojabohne: geschichte, kultur und verwendung unter besonderer berücksichtigung der verhältnisse in Niederländisch-Indien. 88pp. Berlin, Paul Parey, 1923. 60.3 K32
"Literaturverzeichnis", pp. 76-80.
Includes material on the history of the soybean, its culture, prices, and utilization in the United States, and utilization of soybeans and various food preparations made from them in various countries.
116. Kennedy, Carl N. Getting the facts about soy beans. Wallaces' Farmer 45(53): 2876. Dec. 31, 1920. 6 W15
It is pointed out that there is a good deal of misrepresentation in the varieties of seeds, and that "if soy beans are to become a commercial crop in Iowa, some of the fundamental work will be to find out which types are best adapted for the particular purposes for which they are desired. Very likely then they will give better satisfaction than is possible under present conditions."
117. Kennedy, L. W. The soybean. A new American. Purdue Agr. 29(9): 83, 86. June 1935. 6 P97
The writer traces the history of the soybean in the United States, and outlines the industrial and food uses which have been found for it.
118. Khankhoje, Pandurang. El frijol soya. El Campesino 1(7): 14-15. March 1936. 8 C152
Contains a section on the importance and utilization of the soybean.

119. Kiesselbach, T. A. Soy beans. Nebr. Agr. Expt. Sta. Bull. 166, 16pp. Lincoln, 1918.
The following sections are included in this bulletin: Uses; food values; composition; adaptation and varieties; relative yields of soy beans and cereal crops; harvesting and threshing; soy beans as a forage crop; how to use soy beans for human food. Recipes are given in this last section.
120. Kiesselbach, T. A. Soy beans and cowpeas. Nebr. Agr. Expt. Sta. Bull. 150, 31pp. Lincoln, 1915.
The bulletin includes the adaptation and uses of soybeans and cowpeas for Nebraska conditions, their composition and feeding value, yields in other states, varieties tested and yields at the Nebraska Experiment Station, their use for hay and for silage, their yield compared with grain crops at the Nebraska Experiment Station, their use as soil improvers, and their place in rotation, harvesting, threshing and storing.
121. Kiltz, B. F. Soybeans for Oklahoma. Okla. Agr. Expt. Sta. Circ. 77, 14pp. Stillwater, 1930.
The writer discusses in part the importance of soybeans for Oklahoma, their adaptation to soil conditions in the State, the varieties of soybean and their characteristics, harvesting the hay, and harvesting seed, and the uses of the crop.
122. King, B. M. The soybean crop in Missouri. Mo. Agr. Expt. Sta. Circ. 174, 15pp. Columbia, 1924.
Includes discussion of the advantages of soybeans grown in mixtures with other crops, the harvesting of soybeans for hay and seed, the place of soybeans in the crop rotation, their effect upon the yield of wheat, the cost of producing soybeans and the feed value of soybean hay.
123. Kinney, E. J. Soybean project, junior 4-H clubs. Ky. Agr. Col. Ext. Circ. 94, rev., 14pp. Lexington, 1930.
Reference, p. 14.
History of the soybean, its increasing importance in the United States, methods of harvesting for hay and seed, and threshing methods are included.
124. Kinney, E. J. Soybeans and cowpeas in Kentucky. Ky. Agr. Col. Ext. Circ. 292, 25pp. Lexington, 1937.
Includes discussion of the importance of soybeans and cowpeas in Kentucky, varieties of soybeans and cowpeas for Kentucky, the harvesting of soybean and cowpea seed, threshing, storing of the seed, yields of soybean and cowpea hay, and hay mixtures including soybeans and cowpeas.

125. Kornfeld, Arnold. Die Ölbohne oder soja. 32pp. Hamburg, F. W. Thaden [1935]. ([Neues] handbuch der tropischen agrikultur... Ergänzung.) 60.3 K84
Includes, pp. 1-4; material on the history of the soybean and its present day extension in various countries; the bean in crop rotation in Europe and the United States, pp. 18-19; Pests of the bean, pp. 19-22, and diseases, pp. 22-24, in various countries; the uses of the soybean, pp. 24-32.
Schriftwerk, p. 32.
126. L., W. H. The soybean - a crop with a future. Ohio Farmer 150(15, whole no. 3891): 354. Oct. 7, 1922. 6 Oh3
"The soybean has become definitely established as a commercial crop in the Middle West. It promises to rank with alfalfa as a hay crop; it will give clover a race as a soil-improving crop; it has already proven its value as a supplement to corn for both silage and hogging down purposes. As a cash crop it has great possibilities since the oil which it yields is in great demand both for food and for use in the arts. Either the raw bean or the resultant cake left after the oil is extracted or expressed has a high value as a protein supplement when combined with the proper mineral mixture.
"These are facts which were gleaned at the recent Soybean Field Day at the Ohio Experiment Station..."
127. Lacey, James. From sandburs to soy beans. Hoard's Dairyman 62(13): 363. Oct. 14, 1921. 44.8 H65
"A few fields which have really never produced anything but sandburs are maturing a crop of soys that will help to pay the taxes for years to come..."
128. Landis, Harry A. Soybeans and their culture. Ohio Farmer 145(21, whole no. 3767): 872-873. May 22, 1920. 6 Oh3
The importance of soybeans, their climatic adaptations in the United States, and harvesting and threshing are described. A diagram shows the numerous uses of the beans.
129. Landon, I. K. Soy beans as a cash crop in eastern Kansas. Kans. State Bd. Agr. Bien. Rept. (1919-1920) 27: 250-254. Topeka, 1931.
"In brief, the advantages of the soy bean as a cash crop are that it produced a satisfactory acre return and does so with reasonable consistency, it and its by-products are protected by the tariff from foreign competition, the straw is a valuable stock feed and the fertility added to the soil by the inoculated soy beans enables the farmer to produce larger crops on that field the next year." Methods of handling the beans are included.
130. Langenberg, Johannes Wilhelm Hermann. Die bedeutung der sojabohne in der weltwirtschaft. 103pp. Pinneberg bei Hamburg, Buchdruckerei A. Beig, 1929. 60.3 L26

Inaug.-diss.- Köln.

"Literaturübersicht", pp. 5-6.

Part 1. discusses the culture and production of the soybean, including mention of the chief producing countries and, pp. 26-29, soybean culture in the United States, its history and amount of production in the chief producing states.

Part 2. takes up the soybean in foreign trade, with particular reference, however, to the Manchurian industry and its exports to Asia and Europe.

Part 3. describes the utilization of the soybean, and its production and quantities of exports and imports of soy meal in individual countries including the United States. A table giving the oil cake imports into the United States 1910-1926 is offered, pp. 87-88. The soybean in human nutrition is also taken up, with description of the attempts to establish it as a means of subsistence in Europe and the United States.

131. Layson, S. V. How to grow soy beans. Dairy Farmer 19(9): 264-265. May 1, 1921. 44.8 K56
Although concerned chiefly with cultural methods, this article brings out some of the uses for soybeans on the farm, their yield and the price of seed.
132. Lechartier, G. Étude sur le soja hispida. Annales de la Science Agronomique Française et Étrangère 8: 380-396. 1902-1903. (2e Série- Huitième Année. 1902-03. Tome 1) 14 An75
The use of the soybean and its harvesting as green forage and as seed, and the composition of the bean are briefly taken up, among other things.
133. Lewis, R. D. Soybeans for Pennsylvania. Penn State Farmer 14(7): 250, 255-256. April 1921. 276.8 P38
The growing importance of soybeans in Pennsylvania, uses of the crop, and best seed-yielding varieties are discussed.
134. "Little honorable plant". Time 28(15): 76, 78, 80. Oct. 12, 1936.
The value of the soybean crop to the United States, the increasing acreage planted in soybeans, their uses as food, and in the factory, and the utilization of the beans in the Ford plant are discussed.
A Spanish translation of this by Prof. Miguel A. Valdivia, under the title "La pequeña planta honorable" was printed in the Revista de Agricultura [Cuba] 20(2): 67-69. February 1937.
8 Ag88Re
135. Li-Yu-Ying, and Grandvoinet, L. Le soja: sa culture, ses usages alimentaires, thérapeutiques, agricoles et industriels; traduction revue et augmentée de l'édition chinoise publiée par les soins de la Société biologique d'extrême-Orient. 150pp. Paris, Augustin Challamel, 1912. 60.3 L61

This is a study of the soybean which includes material on its origin and history, its uses as food for human beings and animals, food products made from it, and its industrial uses.

136. Lloyd, Walter H. Let George do it and he did! Briggs made national soybean field day a real success. Ohio Farmer 152(13, whole no. 3943): 294. Sept. 29, 1923. 6 Oh3
This is an account of talks given at the National Soybean Field Day at the University of Wisconsin.
137. Lloyd, Walter H. Possibilities of the soybean. Ohio Farmer 148(12, whole no. 3836): 255,275. Sept. 17, 1921. 6 Oh3
This is a description of the demonstration given by the Johnson seed farms in Williams County, Ohio, on the possibilities of the crop.
138. Lothrop, Leon. Soya beans. North-West Farmer 51(18): 8-9, 29. October 1932. 7 N83
The writer discusses the value and importance of soybeans in various countries, their uses, amount of production in the United States, the possibilities of the crop in Western Canada, and the prices which might be expected if they do grow them.
139. McArthur, William. Ten years of soybean experience. This farmer grew soys with corn for silage, and alone for seed and hay. Wallaces' Farmer 52(17): 656. Apr. 29, 1927. 6 W15
Harvesting the crop is briefly discussed.
140. McClelland, C. K. Speaking of soy beans. 5pp., processed. A.E. Pam. Coll. (Soybeans)
"From the Arkansas Gazette Magazine, Little Rock, Sunday, Mar. 1, 1936."
"...What we need in Arkansas is a larger planting of soy beans that we may feed the cattle and ourselves, as well as the horses, at the same time helping to keep the mills running and keeping some of the money now used for imports at home."
141. McGuire, Ray F. Soybean values. 15pp. Cedar Rapids, Iowa, Soybean production advisory board [1934]. 60.3 M17
"Literature cited", p. 15.
Values as a farm crop, pp. 4-5, Commercial possibilities, p. 5, Valuable human food, pp. 5-6, Modern method of producing oil and oil meal, p. 6, Utilization of soybean oil, pp. 6-8, Utilization of soybean oil meal, pp. 8-9, Soybean flour, p. 10, Imports, exports and the tariff, p. 10, Marketing soybeans, oil and meal, pp. 10-11, Potential markets, p. 11, Production last year (in the United States), pp. 11-14.
Graphs show the domestic production of soybean oil, 1927-1932, and the increasing seed production in Iowa 1925-1933, and a map shows the principal soybean producing counties in Iowa.

142. McRostie, G. P., Hamilton, R. I., Dimmock, F., and Clark, S. E. Soybeans in Canada. Canada Dept. Agr. Pamphlet (n.s.) 93, 11pp. Ottawa, 1928. 7 C16Pa
Harvesting; p. 5; uses of soybeans, pp. 7-8.
143. Malin, D. F. Soy beans as a corn substitute. Wallaces' Farmer 47(4): 99. Jan. 27, 1922. 6 W15
"The soy bean offers excellent possibilities to corn belt farmers, not only as a substitute for part of the corn but also as a supplement for part of the corn planted in 1922."
144. Manchurian repercussions in the oil markets. Chem. Markets 30(4): 341-343. April 1932. 381 C426
"To the Far East the soybean is essentially a food. Industrial uses are of a secondary consideration. To us contrarywise industrial uses are of greater comparative consideration...
"The chemical and allied industries are interested therefore, in what effect events in Manchuria will have on supplies and prices..."
Our consumption of soybeans is given, and the hearings of 1929 and 1930 for the Smoot-Hawley Tariff relating to soybean oil, and the Tariff Commission's report to Congress on costs of production and transportation of several important oils are summarized.
145. Mansfield, O. W. Growing soybeans with corn. Purdue Agr. 11(7): 22, 53. April 1917. 6 P97
Part of this article is devoted to harvesting methods and the results of feeding the ensilage to beef cattle and dairy cows.
146. Matenaers, F. F. Die sojabohne, ihre kultur und wirtschaftliche bedeutung. Mitteilungen der Deutschen Landwirtschafts-Gesellschaft 29(40): 549-553. Oct. 3, 1914. 18 D48M
Includes discussion of the extent of soybean culture in the United States, composition and yield in the United States, and uses in animal feeding. Harvesting methods are touched upon.
147. Mathews, I. J. More soybean questions. Ohio Farmer 143(22, whole no. 3716): 851. May 31, 1919. 6 Oh3
A few of the questions are on the profitability of soybeans, the market for them, the advisability of using them as a green manure crop, and the permanence of soybean popularity.
148. Megee, C. R. Soy beans. Mich. Agr. Expt. Sta. Spec. Bull. 100, 11pp. East Lansing, 1920.
The value and advantages of soybeans are brought out, pp. 3-5, and harvesting methods, 10-11.
This bulletin is printed in Mich. State Bd. Agr. Ann. Rept. (1919/1920) 59: 546-554. Lansing, Wynkoop Hallenbeck Crawford Co., State Printers, 1921.

149. Meharry, C. L. Eight years growing soy beans. This crop destined to become as staple as oats. Orange Judd Farmer 62(7): 1, 6-7. Feb. 17, 1917. 6 Orl

The author feels that the crop is a valuable one both from the financial and the soil fertility standpoints, and describes his experiences in growing and harvesting the soybean crop.

150. Metropolitan life insurance company, Policyholders' service bureau. A report on soy beans and soy bean oilmeal. 15pp., processed. New York, 1925. Pam. Coll. 60.3 M

"The purpose of this report is to compile the available information on the use of soybean oilmeal in the United States." - Prefatory note.

Contents. - Introduction, p. 1; Uses of the soy bean, p. 2; Commercial importance of soybean oil and meal, p. 3; Method of oil extraction, pp. 4-5; History of the soybean in the United States, pp. 6-9; Present uses of soybean oilmeal cake, pp. 9-11; Soybean meal as a fertilizer, pp. 11-12; Production of soybeans in the United States, p. 13; Estimates of recent production [in Illinois and in the United States], pp. 14-15.

151. Mighell, Albert, Hughes, H. D., and Wilkins, F. S. Soybeans in Iowa farming. Iowa Agr. Expt. Sta. Bull. 309, pp. 147-206. Ames, 1934.

The following subjects are taken up: Soybeans as a concentrate, for hay and as an emergency crop; the expansion of the soybean acreage in Iowa; the reasons for which Iowa farmers may be interested in soybeans; recommended varieties of soybeans; harvesting the beans as seed and as hay; the time element in soybean production; and the adjusting of plans in response to changes in prices and costs of production.

152. Mills, Zeller R. Commercial growing of soybeans in Iowa. 15pp. Cedar Rapids, Iowa, Soybean production advisory board co-operating with Soybean products, inc. [1934]. (Farmers' bulletin no. 1, 1934) 60.39 So9 no. 1

"The information presented in this bulletin has been compiled and approved by members of the Advisory Board because of their belief that improvement in cultural methods will prove an important factor in the development of commercial soybean production in Iowa through increasing both the acre-yields and the net returns per acre."

Harvesting and threshing are taken up, pp. 11-13; storing the beans, p. 13; yields per acre, p. 13; factors affecting price of soybeans, pp. 13-14; marketing the crop, p. 14; need for processing soybeans, pp. 14-15; the work of Soybean Products, inc., p. 15.

153. Minns, Edward R. Soy beans. N. Y. Dept. Agr. Bull. 87, pp. 2938-2944. Albany, September 1916. 2 N482

The writer discusses the history of the soybean, its utility, and methods used in growing soybeans as a soiling crop, for silage, for hay, for pasture, for seed and grain, and for soil improvement.

154. Missouri. State Board of agriculture. Cowpeas and soy beans. Mo. State Bd. Agr. Monthly Bull. 12(5): 3-48. May 1914. 2 M69B
Introduction, by W. L. Nelson, pp. 3-7, discusses the increased favor of soybeans and cowpeas on the farm.
Soy beans and cowpeas, by A. T. Wiancko, M. L. Fisher, and C. O. Cromer, pp. 8-27, includes a brief history of the crops, their uses and value, and harvesting and threshing methods. This is a reprint of Ind. Agr. Expt. Sta. Bull. 172, pp. 421-438. Lafayette, 1914. (vol. 17)
155. Mistakes and successes with soybeans. Prog. Farmer (Miss. Valley ed.) 41(6): 462. April 17, 1926. 6 So81
This is a group of letters from readers on their experiences with soybeans. Two cite financial returns from soybeans, and one relates the writer's experiences in feeding them to chickens and pigs.
156. Mooers, Charles A. The soy bean. A comparison with the cowpea. Tenn. Agr. Expt. Sta. Bull. 82, pp. 75-104. Knoxville, 1908.
"The data presented in the pages which follow indicate that under Tennessee conditions each crop has a place which the other can not take..."
157. Mooers, Charles A. The soy-bean as a farm crop. Amer. Soc. Agron. Proc. (1907-1909) 1: 153-158. [Washington, D. C.] 1910. 4 Am34P
The author finds that "after 30 or more years of...trial the melancholy truth must be admitted that the American farmer has not taken kindly to the soy bean, at least to the extent of its becoming as a matter of fact an important farm crop." He considers the reasons for this, compares the value of soybeans with cowpeas, and points out the favorable outlook for the soybean.
158. Moore, R. A., and Delwiche, E. J. Soybeans - a crop worth growing. Wis. Agr. Expt. Sta. Bull. 289, 16pp. Madison, 1918.
The writers discuss the soils adapted to soybeans, the uses for soybeans, the best varieties for Wisconsin, the growing of the crop, and harvesting for hay, for silage and for seed.
159. Moore, R. A., Delwiche, E. J., and Briggs, G. M. Soybeans - a good legume crop borrowed from the Orient. Wis. Agr. Expt. Sta. Bull. 375, 32pp. Madison, 1925; Rev. 1929.
In addition to methods of cultivation, the importance and uses of soybeans, harvesting and varieties, are brought out. The uses of soybeans recommended for northern, central and southern Wisconsin are given in tabular form, as well as the average yield of soybeans at Madison 1917-24.

160. Moore, R. A., and Delwiche, E. J. Soy beans - an important Wisconsin crop. Wis. Agr. Expt. Sta. Bull. 236, 20pp. Madison, 1914.

"The object of this bulletin is to discuss briefly the cultural requirements of the soy bean, to furnish information in regard to the different uses to which the crop may be put, and to show the results secured with the pedigree varieties developed by the College especially for Wisconsin conditions."

A brief history of the soybean is also included.

161. Moorhouse, L. A. Cowpeas and soy beans. Okla. Agr. Expt. Sta. Bull. 74, 22pp. Stillwater, 1907.

Adaptations of the crops to Oklahoma conditions, their place in the rotation, their importance to the stockman farmer, their chemical composition, and harvesting methods and machinery are described, among other things.

162. Morris, Curtis. Soy bean conference at Corsicana. East Texas Chamber Com. East Texas 10(4): 9, 21. January 1936. 6 Ea73

A description of plans for the East Texas Soy Bean Conference at Corsicana, January 14-15, sponsored by the East Texas Chamber of Commerce.

163. Morris, H. T. Story of soybeans. Flour & Feed 34(11): 9; (12): 9. April-May 1934. 298.8 F66.

The writer outlines the history of the soybean in the United States, and in Illinois, the uses for soybeans in animal feeding, and the system of manufacturing oil meal used at the A. E. Staley Manufacturing Company, Decatur, Ill. He quotes A. A. Horvath on the food uses of the soybean.

164. Morse, William Joseph. Growing soy beans as a cash crop. Will it pay to produce soy beans for oil and meal in the Corn belt? Wallaces' Farmer 48(5): 155, 161. Feb. 2, 1923. 6 W15.

"The large importations of soy beans, soy bean oil and soy bean cake into the United States the past few years, and the enormous market demands for vegetable oils and oil meals seem to indicate a ready market for soy bean products. The possibilities of developing a manufacturing industry with American grown seed appear excellent, especially in the central states. Many soy bean enthusiasts believe that the soy bean is destined to become one of the major field crops in the United States..."

165. Morse, William Joseph. Hokubei Gasshiu-goku ni okeru daizu no seisan narabini riyo no genkyo (The present situation of the soybean in the United States) [22pp.?] [Tokyo?] Soybean research institute, 1930. J 60.3 M83

"This is the lecture on soybeans given by Mr. Morse when he went to Japan in 1930. Translated into Japanese by Yoshi Takamori." - Typed slip pasted in book, signed S. K.

166. Morse, William Joseph, and Hendrick, H. B. Illustrated lecture on soy beans. 16pp. Washington, Govt. print. off., 1919. (U. S. Dept. of Agriculture, Syllabus 35) 1 Ex6Fa no. 35
Contribution from the States Relation Service...in cooperation with the Bureau of Plant Industry.
There are brought out, among other things, the increasing importance of the soybean in the United States, its feeding value for sheep and hogs, its use as pasture, silage and hay, value of planting the beans for seed and for oil, use of the meal as a fertilizer, soybeans and meal as human food, the place of the bean in the cropping system, harvesting and storing, and value of the crop as compared with cowpeas.
167. Morse, William Joseph, and Cartter, J. L. Improvement in soybeans. U. S. Dept. Agr. Yearbook, 1937: 1154-1189. Washington, D. C., 1937. 1 Ag84Y
Selected references on genetics of the soybean, pp. 1181-1184.
Although mainly concerned with breeding methods for soybeans, the article discusses as well the history of the bean, its distribution and production throughout the world, and its utilization.
An outline showing the diversity of uses for soybean products is given on p. 1160.
This article is summarized in this same issue of the Yearbook, pp. 154-155.
168. Morse, William Joseph. Soybean hay and seed production. U. S. Dept. Agr. Farmers' Bull. 1605, 13pp. Washington, D. C., October 1929. 1 Ag84B
"This bulletin supersedes Farmers' Bulletin 886, Harvesting Soy-Bean Seed."
Methods of harvesting and handling the soybean crop are discussed, with brief reference to their grading and marketing.
169. Morse, William Joseph. Soy bean in Manchuria. Rural New Yorker 79(4595): 1208. July 17, 1920. 6 R88
This is a brief discussion of the history of the soybean in Manchuria and the extent to which it is planted in the United States. The article is a reply to an editorial in the Rural New-Yorker 79(4586): 948. May 15, 1920.
170. Morse, William Joseph. The soy-bean industry in the United States. U. S. Dept. Agr. Yearbook 1917: 101-111. Washington, D. C., 1918. 1 Ag84Y
The writer treats of the early history of the soybean industry, the importance and uses of soybeans in the United States, and the possibilities of the soybean industry in the United States.
Also published as Dept. Separate 740.
A translation of this appears under the title "La industria del soy bean en los Estados Unidos" in Revista de Agricultura, Comercio y Trabajo (Cuba) 4(3): 521-524. March 1921. 8 Ag88Re

171. Morse, William Joseph. Soy-bean output increasing in United States. U. S. Dept. Agr. Yearbook. 1926: 671-673. Washington, D. C., 1927. 1 Ag84Y

"In the last decade the soy bean has advanced from a position of minor to one of major importance. Previously soy beans were grown only occasionally, usually as a substitute crop when clover or some other crop failed. At the present time the plant is grown regularly for hay, grain, and pasture, and with corn as silage."

172. Morse, William Joseph. Soybean varieties and their utilization. Assoc. South. Agr. Workers Proc. (1936) 37: 64-65, processed. [Atlanta, Ga., 1937] 4 C82

Abstract of paper.

Describes trends in soybean production in the United States, the commercial uses of the bean, variety experiments and their value.

173. Morse, William Joseph. Soy-bean varieties newly developed for U. S. farms. U. S. Dept. Agr. Yearbook 1926: 676-679. Washington, D. C., 1927. 1 Ag84Y

The writer points out that in the past twenty years more than 1000 varieties of soybeans have been introduced into the United States. A table shows "Value of seed and hay of the principal new soy-bean varieties introduced and developed by the United States Department of agriculture" (based on yields in 1924).

174. Morse, William Joseph. Soy beans: culture and varieties. U. S. Dept. Agr. Farmers' Bull. 1520, 34pp. Washington, D. C. Issued April 1927. 1 Ag84F

Includes a brief discussion of the history of the soybean, and takes up among other things, its climatic adaptations, the varieties recommended for different areas, and the growing of soybeans in mixtures.

Supersedes Morse, W. J. The Soy Bean; Its Culture and Uses. U. S. Dept. Agr. Farmers' Bull. 973, 32pp. Washington, D. C. July 1918.

175. Morse, William Joseph. Soybeans now a major crop in United States; few grown before 1898. U. S. Dept. Agr. Yearbook. 1933: 198-205. Washington, D. C., 1933. 1 Ag84Y

Traces the increase in knowledge of variety adaptation of soybeans, the investigation of variety utilization, the soybean oil and meal industry in the United States, the growing use of soybean oil, soybeans as human food, and the export of soybeans from the United States since 1931.

176. Mortimer, G. B. If winter kills your hay. Hoard's Dairyman 74(8): 401, 425. April 25, 1929. 44.8 H65

The advantages of soybeans over other crops, cost of the seed and expected yields of the crop are briefly touched upon.

177. Moscow. Nauchno-issledovatel'skii institut soi i spetsial'nykh kul'tur. K uborke urozhaia soi i nov'ikh kul'tur. 89pp. Moskva, 1932. (Bulletin no. 1) 60.39 M85

Includes papers on the following subjects: Inspection of soybean acreage as a means of obtaining higher yields, by V. I. Geimer, pp. 22-28; estimation of the soybean crop, by N. Luk'ianov, pp. 28-34; methods of harvesting soybeans, by G. S. Bardin, pp. 34-37; the drying and storing of soybean seed, by M. Dunin and G. A. Val'dman, pp. 56-61; the soybean for pasture, by N. A. Lebedev, pp. 70-73; the soybean for hay and forage, by N. A. Lebedev, pp. 73-77.

178. Myer, D. S. Why not grow soybeans? An easily grown legume that has a great future on Ohio farms. Ohio Farmer 147(17, whole no. 3815): 567. Apr. 23, 1921. 6 Oh3

The place of soybeans in the Ohio farming systems, the reasons why the soybean acreage has increased rather slowly, and the harvesting experience of P. Lewis Mark of Franklin County, Ohio, are briefly spoken of.

179. Need transit on soy beans. Grain Dealers Jour. 63(4): 243. Aug. 25, 1929. 298.8 G76

"Soy beans are becoming an important factor in the grain and feed trade and should be accorded the full privileges of grain in all freight rate and privilege schedules according to representatives of the grain and feed trade who appeared before a hearing of the Central Freight Ass'n held in Chicago August 20...

"Speakers told of the rapid development of the bean industry and emphasized that the movement of the beans for seed was a very small part of the shipments at the present time..." Brief comments by various speakers follow.

180. Nelson, Martin. Soy beans. Ark. Agr. Col. Ext. Circ. 167, 12pp. Little Rock, 1924.

Has a short paragraph on harvesting the beans, and on storing the seed.

181. New Jersey. Agricultural experiment station. Rye straw and soy beans. N. J. Agr. Expt. Sta. Rept. (1913) 34: 401-402. New Brunswick, 1914.

Thirty-fourth annual report of the New Jersey State Agricultural Experiment Station and Twenty-sixth annual report of the New Jersey Agricultural College Experiment Station.

The report of the Department of Farm Crops has a statement of results for soybeans planted after rye. For both crops there is given the value of the crop, total cost, total profit and average profit per acre.

182. Noll, Charles F. Soy beans for Pennsylvania. Natl. Stockman & Farmer 47(47): 1254. Feb. 23, 1924. 6 N21

The writer includes material on the value of soybeans versus oats, feeding value and yields of soybeans, the uses of the crop, its harvesting, and the varieties suited to Pennsylvania.

183. Noll, Charles F., and Lewis, R.D. Soybeans: their culture and uses. Pa. Agr. Expt. Sta. Bull. 187, 15pp. State College, Centre County, 1924.
"The purpose of this bulletin is to report soybean investigations to date, make recommendations in regard to varieties, and give brief cultural directions for the crop."
Table II. gives average yields per acre of seed and of field cured hay of varieties of soybeans, in order of yields of hay, 1913-23; table IV. shows a comparison of yields of crops in the oats rotation and in the soybean rotation; and table V. gives the feeding values of oats and of soybeans grown on alternate plots.
184. Oakley, R. A. The seed supply of the nation. U. S. Dept. Agr. Yearbook, 1917: 497-536. Washington, D. C., 1918. 1 Ag84Y
The seed supply of soybeans is discussed, pp. 523-524.
185. O'Brien, Harry R. Soy beans for profit. Combines and a cash market cause acreage to mount. Country Gent. 94(11): 19, 120-121. November 1929. 6 C833
Growth of the soybean industry has been hampered by difficulties of harvesting and lack of commercial market for the beans. The situation has changed through what the writer says is "a story of the combine harvester, of an impending shortage of protein for supplement feed, of the adoption of soy-bean meal in commercial feeds and of growing beans on contract for this latter purpose."
186. Oklahoma farm chemurgic conference. 1st, Oklahoma City, 1937. Proceedings of the first Oklahoma farm chemurgic conference...in Oklahoma City's civic center, November 9 and 10, 1937. V.p. [135pp.] Processed. [Oklahoma City, 1937] 281.9 Ok4
On cover: Oklahoma City Chamber of commerce.
Possibilities of chemistry and agriculture, by Harry E. Barnard, 17pp., includes, pp. 8-9, a discussion of the industrial uses for soybeans.
Soybeans in Oklahoma, by James E. Webster, 8pp., has the following statement: "In the time allotted me, I wish to review for you something of the history of soybean culture in the United States; also, tell you something of its present importance to farmers and industrialists; and finally, to present to you something of the present status and future importance of the soybean crop to Oklahoma, as revealed by a study of our experimental data."
187. Ostrander, W. A. Soy beans assure legumes for dairy farms. Jersey Bull. and Dairy World 42(11): 505, 541, 542, 543. March 14, 1923. 43.8 J48
"The soybean is 'the pinch hitter' that is being called to bat to pull the clover slump out of a bad position." Reductions in cost of production on dairy farms, the selling of surplus soybean grain to mills, and the use of the beans with corn for silage are discussed.

188. Palen, L. S. The romance of the soya bean. *Asia* 19(1): 68-74. January 1919. 286.8 Am31
The writer brings out the opportunity there is for the United States to import large quantities of soybean products from the Orient and our uses for them. The return space for shipping would, he feels, make possible the development of markets there for new commodities. He discusses the food products from the bean and concludes: "Yet even now with our science in improving seed and with our mechanical inventions, it is perhaps questionable whether the soya can ever become a great profitable staple in this country in competition with the disproportionately low costs of production in Manchuria. Although the increasing ravages of the boll weevil in the cotton belt may lead to a larger place in the South for the soya, it must be taken into consideration that the cheapness of the Manchurian product may force the cotton farmer to find another substitute in which the Chinese farmer does not compete. Nevertheless, American farmers may always retain the soya on a restricted acreage because of its unquestioned value as a forage crop and as a soil improving element in rotation. Likewise as a food for animals it may achieve to an extended use, when its concomitant advantages of the straw and the fertilizer accrue to the farmer..."
189. Pearce, J. M. Future of the soybean industry. *Purdue Agr.* 21(5): 104, 114. February 1927. 6 P97
"In view of all these [afore-mentioned] facts, I can see nothing but a great future for the soybean industry in our State. It is not only a profitable and practical farm crop, but it has many commercial possibilities which have not, as yet, been developed..."
190. Pelton, W. C. Hahto soy bean as a lima substitute. *Rural New Yorker* 79(4579): 625. Mar. 27, 1920. 6 R88
The soybean is compared with the Lima bean as to size and habit, adaptation to weather and insect attacks, and use as food. The good qualities of the Hahto soybean are listed.
191. Piper, Charles Vancouver, and others. Hay. U. S. Dept. Agr. Year-book, 1924: 285-376. Washington, D. C., 1925. 1 Ag84Y
Contains a passage, p. 322, on soybeans, which gives soybean acreage in the United States, and the value of the hay for various farm stock.
192. Piper, Charles Vancouver, and Morse, William Joseph. The soybean. Ed. 1, 2d impression, 329pp. New York (etc.) McGraw-Hill book co., inc., 1923. (Agricultural and biological publications) 77 P66
Bibliography, pp. 288 b-310.
"The soybean, also known as soya or soja bean, has assumed great importance in recent years and offers far-reaching possibilities of the future, particularly in the United States.

It is, therefore, desirable to bring together in a single volume the accumulated information concerning this crop...

"The aim has been to present the information so as to make it useful from both agricultural and commercial standpoints, not omitting, however, much that is mainly of historical or botanical interest..."

Partial contents: Ch. I. Introduction, pp. 1-4, (includes present importance and future prospects in the United States); Ch. II. The commercial status of the soybean, pp. 5-26; Ch. IV. Agricultural history of the soybean, pp. 35-54; Ch. VI. Harvesting and storage of soybeans, pp. 85-101; Ch. VIII. Utilization of the soybean, pp. 129-143; Ch. XI. Soybean oil, pp. 194-203; Ch. XII. Soybean cake or meal, pp. 204-218; Ch. XIII. Soybean products for human food, pp. 219-258; Ch. XIV. Table dishes of soybeans and soybean products, pp. 259-279 (includes recipes); Ch. XV. Enemies of the soybean, pp. 280-288.

193. Piper, Charles Vancouver, and Morse, William Joseph. The soy bean; history, varieties, and field studies. U. S. Dept. Agr. Bur. Plant Indus. Bull. 197, 84pp. Washington, D. C., 1910. 1 P69B
Early Agricultural History in the United States, pp. 26-27.

194. Piper, Charles Vancouver, and Morse, William Joseph. The soy bean, with special reference to its utilization for oil, cake, and other products. U. S. Dept. Agr. Bull. 439, 20pp. Washington, D. C., Dec. 22, 1916. 1 Ag84B

Contents: Introduction, pp. 1-2; Soy beans in Manchuria, pp. 2-4; Soy beans in Japan, pp. 4-5; Soy beans in Europe, pp. 6-7; Soy beans in the United States, pp. 7-9; Methods of oil extraction, pp. 9-11; Soy-bean meal as human food, pp. 11-13; Soy-bean meal as stock feed, pp. 13-14; Soy-bean meal as a fertilizer, pp. 14-15; Uses of soy-bean oil, pp. 15-16; Analyses of important varieties of soy beans, pp. 16-17; Possibility of developing a manufacturing industry with American grown soy beans, pp. 18-20.

Extracts from this bulletin appear under the title "Soy Beans" in Hoard's Dairyman 53(15): 641. May 4, 1917. 44.8 H65

An anonymous article based on the bulletin is to be found under the title "The Soy Bean. Thrives in United States - of importance as source of oil, food products, and fertilizer." U. S. Dept. Agr. Weekly News Letter 4(23): 4. Washington, D. C. Jan. 10, 1917. 1 Ag84W

195. Pope, Felix T. Soy bean growing in importance. Grain Dealers Jour. 62(2): 124. Jan. 25, 1929. 298.8 G76

The author brings out the history and increasing production of soybeans in the United States. Uses for the oil are touched upon.

196. Post, A. H. Soybeans: their adaptation and production in Montana. Mont. Agr. Expt. Sta. Bull. 335, 11pp. Bozeman, 1937.
The writer takes up the climatic and soil adaptation of the soybean, the results of growing soybeans on irrigated and on dry land in Montana, the varieties of soybeans, and harvesting methods.
197. Pridmore, J. C. Soy beans. South. Fert. Assoc., Soil Improvement Com. Bull. 17, 6pp. Atlanta, Ga. [19--?] 57.9 So8S
Harvesting, threshing, and storing the crop, yields and value as a farm crop for the cotton section, are included.
198. Prince, Ford S. The soy bean in New Hampshire. N. H. Agr. Expt. Sta. Bull. 181, 20pp. Durham, 1917.
"The purpose of this bulletin is to describe methods of growing and harvesting the soy bean, to discuss ways in which our farmers may use it, and to report some field trials of varieties, inoculation and fertilization which have been made at the Experiment Station during the past few years."
Table IV. Soy Bean Yields and Analyses, gives the constituents of sixteen varieties; and Table VII. Digestible Nutrients in 100 Pounds, compares soybean hay with alfalfa hay, red clover hay, and timothy hay.
199. Ralston purina company, St. Louis, Mo. Soybeans for beginners. 8pp. St. Louis, Mo., Ralston purina co. [1934]. Pam. Coll. 60.3 R
"The material has been prepared by E. F. Johnson..."
Soybeans as a solution to the corn acreage reduction problem, p. 1; the place of soybeans in the regular corn-belt rotations, p. 2; varieties recommended for commercial production, pp. 3-4; harvesting, threshing, yield of grain and seed storage, p. 6; marketing, p. 7; outlook for soybeans in the future, pp. 8-9.
200. Richardson, J. W. La soja y el conflicto sino-japonés. La Hacienda 27(8): 294-295. August 1932. 6 H11
It is said that this plant, which plays such an important rôle in nourishment and in modern industries, forms the axis around which revolves the struggle for dominance of Manchuria. Slight reference is made to the increasing soybean importance in the United States.
201. Richert, T. G. Oils, their production and consumption. Oil and Soap 12(7): 148-152. July 1935. 307.8 J82
"A paper presented at the 26th annual meeting of the American Oil Chemists' Society at Memphis, Tenn., May 23-24, 1935."
Bibliography, p. 152.
Includes figures on production of soybeans, discussion of soybean oil, and a description of the method of extraction used at the Hansa Mills in Hamburg, Germany. Diagrams of the plant are given.

202. Rindl, M. Soy bean. *So. African Jour. Indus.* 3(6): 518-531; (8): 742-749. June, August 1920. 286.8 Sc83
These are two installments (IV and V) of a series of articles on vegetable fats and oils, forming a Report to the Advisory Board of Industry and Science on Vegetable Oils, Fats, and Waxes. Soybeans are considered among the semi-drying oils. The author includes in his discussion the storage of seed, the value of the bean as human food and the food preparations made from them, soybean meal and its uses, fermented soybean products, vegetable cheese and soy sauce. The second installment includes methods of oil extraction, uses of the oil, the use of soybeans as forage, and enemies of the crop.
203. Robert, J. C. Preliminary report on the economic value of the soybean. 15pp. Jackson, Miss., Mississippi Agricultural college, 1915. 60.3 R54
A brief discussion of the history of the bean is given, p. 3; composition, pp. 3-4; feeding value, pp. 4-6; relation to soil fertility, pp. 6-9; yield, pp. 9-10; uses, pp. 12-14.
204. Robertson, D. W., Kezer, Alvin, and Deming, G. W. Soybeans under irrigation in Colorado. *Colo. Agr. Expt. Sta. Bull.* 392, 24pp. Fort Collins, 1932.
Harvesting methods, pp. 7-10; Stage to harvest soybeans, pp. 13-16.
Tables show Annual and average yields of soybean varieties grown at Fort Collins, Colorado, for varying periods from 1923 to 1926; Annual and average yields of Ito San soybeans planted at different dates for the 3-year period, 1924, 1926, and 1927; Time to harvest soybeans under irrigated conditions in Colorado; Yield of corn and soybeans sown together at Fort Collins; Hay yields of soybeans and other annual crops grown at Fort Collins, Colorado, for varying periods, 1923 to 1927.
205. Rusk, E. W. Soy beans. *Ill. State Hort. Soc. Trans* (n.s.) 54: 298-309. 1920. 81 Il6
The writer gives, among other things, a brief history of the soybean and the uses for which it is grown.
206. Sahr, C. A. Report of the Assistant agronomist. Experiments with leguminous plants. *Hawaii Agr. Expt. Sta. Rept.* 1913: 43-49. Washington, D. C., 1914.
The section of the report on soybeans, pp. 46-48, describes the making of soy sauce, and the varieties of soybean adapted to Hawaii. A table gives the "calculated acre yields of soy beans from 20 feet of running row cut for hay and fodder."
207. Salute to the "wonder bean." U. S. Dept. Agr., Agr. Adjustment Admin., Consumers' Counsel, *Consumers' Guide* 3(8): 3-7, 22, processed. Washington, D. C., April 20, 1936. 1.94 Ad422C

This article traces the history of the soybean, and describes its many uses, its food value, the lecithin and vitamins contained in soybeans, the food products made from them, their use as a soil-builder, and soybean production trends in this country. The opening of the cooperative industrial research laboratory at Urbana, Illinois is mentioned.

208. Satow, Sadakichi. Researches on oil and proteids extraction from soy-bean. Tôhoku Imp. Univ. (Sendai, Japan) Technol. Rept. 2(2): 41-164. 1921. 513 T574T
The writer describes the uses of the soybean as a foodstuff, uses of the oil and the bean cake, classification and analysis of soybeans and their standardization, methods of oil extraction and the influence of various factors on it, the isolation of proteids from extracted soybeans, and the effect of heating on the yield of proteid.
209. Schmitz, Nickolas. Soybeans. Pa. Agr. Col. Ext. Circ. 59, 16pp. State College, 1917.
Includes: The Soybean as Human Food, by Pearl MacDonald, pp. 15-16.
The author discusses the place of soybeans in Pennsylvania agriculture, harvesting and threshing methods, the value of the crop in increasing soil fertility, and its uses as animal food.
210. Sconce, Harvey J. The soy bean conquers industrial America. Ill. Jour. Com. 18(1): 16-17, 26, 28, 30, 32. January 1936. HF1.I33
Traces the history of the soybean, and discusses harvesting methods, extraction processes, industrial and food products derived from the beans, the utilization of the bean in the Ford plant, its invasion of the cotton lands, and its adaptability to Tennessee and Canada.
"This is the greatest conquest of territory by a plant in history. Ten years more and it will have revolutionized the industrial manufacturing of America. The soy bean had to come to the United States to get its chance, and it made good."
211. [Shaw, Norman] The soya bean of Manchuria. 32pp. Shanghai, Published at the Statistical Department of the Inspectorate General of Customs..., 1911. (China. Imperial Maritime Customs. II. Special series no. 31) 77 C44
The study includes figures on yield of soybeans in various countries, including the United States, p. 6, and the uses of the bean in the Far East and in the western world, pp. 7-13.
212. Smallwood, H. St. Clair. Romance of the soya bean. Great Britain and the East 46(1307): 752. June 4, 1936. 286.8 N27
Briefly traces the history of the soybean, its food value, its importance to Manchuria, and the recognition it has obtained in the United States, India and Germany.

213. Smith, Alfred G. New grist for the oil mills. Soys have a great market in Dixie's cottonseed plants. Country Gent. 88(6): 8, 42. Feb. 10, 1923. 6 C833
"Fortunately the South has the biggest market in the world for soy beans. There are in round numbers 1000 cotton-oil mills that crush cottonseed, and every one of these mills can be used for crushing soy beans with practically no additional expense for change of equipment..."
The writer sets down the "principal things it takes to make a go of the crop."
214. Smith, Alfred G. Soy beans in systems of farming in the cotton belt. U. S. Dept. Agr. Farmers' Bull. 931, 23pp. Washington, D. C., May 1918. 1:Ag84B
"The soy bean is destined to take a very important place in the agriculture of the cotton belt, not only as a means of improving the soil but also as a feed and commercial crop. It has already been grown with marked success in many parts of the South, and in one section of northeastern North Carolina has become a staple crop. This bulletin presents a brief description of the ways in which successful growers handle this crop in the Southern States." - p. [2].
215. Smith, Joseph Russell. The world's food resources. 364pp. New York, Henry Holt and co., 1919. 389 Sn6
Soybean production, pp. 326-327; soybeans as a food product, pp. 360-365.
216. Smith, William C. Soybean - a crop for emergencies. It will grow and mature a big, valuable crop in a short season. Country Gent. 83(15): 8. Apr. 13, 1918. 6 C833
Reasons for growing the crop are given.
217. Soth, Lauren K. The soybean invasion of the corn belt. U. S. Dept. Agr., Bur. Agr. Econ. Agr. Situation 21(5): 14-16. May 1937. 1 Ec7Ag
Accompanied by a chart which shows acreage of hay, beans, grazed or hedged-off, and equivalent of total solid acreage, 1924 to date. The last paragraph contains a warning against assuming that "soybean growers can continue to expect an ever-expanding market."
This article is reprinted in Amer. Cattle Producer 19(4): 9. September 1937. 49 P94
218. The soya bean. Miller 53(2555): 832. Jan. 9, 1928. 298.8 M61
A note based on Messrs. Kelly & Co., Ltd., of Liverpool's publication with regard to soybean production and uses.
219. The soya bean and its probable effect on the markets. Oil, Paint and Drug Reporter 75(25): 7-8. June 21, 1909. 306.8 O15

Gives an outline of the history of the soybean, its uses, and the probable effect of its introduction into Europe upon our cottonseed and linseed export market.

220. The soya bean industry. An exhaustive survey dealing with the cultivation, production and commerce of the soya bean and its oil, cake, meal and its applications to manufactured products. *Chemist and Druggist* 110(26): 839-842. June 29, 1929. 396.8 C42

The writer discusses the history of the soybean, production in various countries, the Manchurian industry, the growth of soybean consumption in the world, the soybean trade of the United Kingdom and that of the United States, soybean production in the United States, and the uses, both food and industrial, of the bean.

Extracts reprinted under title: "The Demand Still Grows for Soy Beans." *Feedstuffs* 1(20): 12-13. Sept. 28, 1929. 286.8 F322

221. Soya o soja. [Nicaragua] Ministerio de Agricultura y Trabajo. *Boletín de Agricultura y Trabajo* 5, 2a. época(48): 19-20. Managua, June 1933. 8 N51

The writer briefly discusses the history of the soybean, its extension in the United States, uses as hay and oil, food products, and its enemies.

222. Soybean association discusses problems. Annual meeting of organization reviews accomplishments and value of product. *Oil, Paint and Drug Reporter* 122(11): 17, 34. Sept. 12, 1932. 306.8 O15

An account of the annual meeting of the American Soybean Association at Washington, D. C., September 2 and 3, 1932. The chief talks are summarized.

223. Soybean conference attracts big crowd at Milwaukee. *Grain & Feed Jours. Consolidated* 77(7): 300. Oct. 14, 1936. 298.8 G762

Excerpts from addresses at the soybean conference meeting on October 12 of the Fortieth annual celebration of the Grain and Feed Dealers National Association.

"L. B. Breedlove...discussed the development of soybean production in this country...Austin Sturtevant...reviewed the marketing of soybeans...J. E. Barr...reviewed the development of soybean inspection..."

224. Soy bean crop coming to the front. *Farmers' Elevator Guide* 31(7): 12-13. July 5, 1936. 280.28 Am3

"Now there are several questions coming up in regard to the crop. Will the crop come to be burdensome with the rapid increase in production? Will industry be able to absorb it at a price that will justify the farmers to continue to increase their output? Will it have a tendency to displace the so-called overproduction of other crops at an advantage or a disadvantage to agriculture or industry? Can we compete with the production of the crop in Manchuria and other foreign countries?"

225. Soy bean demonstration. Hoard's Dairyman 66(13): 362. Oct. 12, 1923. 44.8 H65

The article gives a résumé of some of the speeches given at the annual convention of the National Soy Bean Growers' Association held at Madison, Wisconsin. Among the subjects discussed were the increasing acreage of soybeans in Indiana, Iowa and Wisconsin; the wide usage for the by-products of the soybean; and soybeans as feed for dairy cattle and livestock.

226. Soybean growers in national meet. Fifth annual field meeting held at Ames last week. Wallaces' Farmer 49(36): 1149, 1152. Sept. 5, 1924. 6 W15

Summary of the problems discussed at the 5th annual meeting of the National Soybean Growers' Association at Iowa State College, Ames, August 29 and 30.

227. Soybean in drought year breaks all crop records. Oil, Paint and Drug Reporter 127(5): 43. Feb. 4, 1935. 306.8 O15

Increasing soybean production in the United States is discussed, with figures.

228. The soy bean invasion. Farmers' Elevator Guide 28(11): 5-8. Nov. 5, 1933. 280:28 Am3

The writer reviews the history of the soybean, its introduction into the United States and into Illinois, harvesting the beans, grading and marketing them, their use in industry and as food, and the probable future of the crop.

229. Soybean plant at Portsmouth, Va. Grain & Feed Jours. Consolidated 71(2): 77. July 26, 1933. 298.8 G762

"On the south branch of the Elizabeth River at Portsmouth, Va., The Allied Mills is erecting an up-to-date plant equipped to process, store and export soybeans...

"It is the purpose of the Allied Mills to cooperate with the various educational institutions and the soybean growers in the Carolinas and Virginia in developing and growing the type of soybeans that will be in greatest demand in the market."

230. Soybean processors. Flour & Feed 37(6): 19. November 1936. 298.8 F66

This is a very brief account of the annual meeting of the National Soybean Processors' Association in Chicago.

231. Soybean processors meet. Grain & Feed Jours. Consolidated 77(8): 362. Oct. 28, 1936. 298.8 G762

"The National Soybean Processors Ass'n met recently at Chicago and heard talks by Dr. O. E. May, director, Regional Soybean Industrial Products Laboratory, at Urbana, Ill., Dr. W. L. Burlison, head, Department of Agronomy, University of Illinois, and J. E. Barr, Marketing Specialist of the Bureau of Agricultural Economics, U. S. Dept. of Agriculture."

232. Soy beans. Calif. Univ. Jour. Agr. 7(7): 22. February 1921. 6 Un34
Experiments at the University farm have shown that soybeans do not grow so well in the interior valleys of California as in the Central and South Atlantic States. Certain varieties of cowpeas have been found to be better from the standpoint of forage and seed production. Soybeans grow better in the cooler and more humid coast districts of Central California.
233. Soy beans. Purdue Agr. 14(7): 396, 398. April 1920. 6 P97
Value of the soybean crop in the agricultural system is briefly touched upon.
234. Soy beans. Wallaces' Farmer 42(13): 586. Mar. 30, 1917. 6 W15
This is a brief outline of the history, uses, varieties, culture, harvesting and handling of soybeans.
235. Soy beans increasing in popularity. Proving a useful crop for Illinois conditions. Orange Judd Farmer 69(13): 392. Mar. 26, 1921. 6 Or1
"Approximately 5300 bushels of soy bean seed were ordered through farm bureaus in Illinois last year...Many more will be used this year." The uses of soys for planting with corn and as a substitute for clover are discussed.
236. Soy beans new East Texas crop. East Texas Chamber Com. East Texas 9(11): 12, 32. August 1935. 6 Ea73
"Soy beans as a new East Texas crop brought 100 cottonseed oil mill operators, agricultural leaders and others together for a conference at Clarksville, July 10, under the auspices of the East Texas Chamber of Commerce.
"A. G. (Pat) Mayse, of Paris, [Texas] President of the East Texas Chamber, has taken the active leadership in calling the attention of East Texas to the possibilities of this remarkable product of nature..."
237. Soy beans on Meharry farm. Orange Judd Farmer 66(8): 312. Feb. 22, 1919. 6 Or1
"Soy beans as a regular crop have been very successful on the A. P. Meharry farm in Champaign county, Illinois. They have been grown there for nine years and the crop is considered of increasing value each year, as the acreage has been gradually increased."
238. Soy beans to the front. Farmers' Elevator Guide 31(4): 14. April 5, 1936. 280.28 Am3
Brings out the growing importance of soybeans in the United States.
239. Soy beans to the rescue. Facing a shortage of legume hay, southern Wisconsin farmers turn to the soy bean for relief. Hoard's Dairyman 74(5): 242-243. Mar. 10, 1929. 44.8 H65
Contains a slight passage on harvesting and expected yields.

240. Special southern grain and forage crops. U. S. Dept. Agr. Monthly Crop Rept. 4(5): 48-50. Washington, D. C., May 1918. 1 St20t
Includes a section (p. 48) on soybeans, which points out increases in acreage and the uses for the beans. A map shows the location of plantings in the United States, and a table (p. 49) gives acreage planted in 1917, amounts harvested for grain and hay, yields per acre, percentages placed in silo and grazed or hogged off, and percentage plowed under for soil improvement. Information in this table is given for each state producing the beans.
241. Špirk, Ludvík. [Soybean as a raw material in chemical industry] Chemické Listy 30: 116-119, 134-137, 151-157. 1936.
Not examined.
"The history, botany, compn., development and uses of the soybean are reviewed. In Czechoslovakia it is grown on 2000 hectares with an annual yield of 30-50 carloads; most of this is extd. for oils or used for animal food. Some of the native soy is made into 'Kaboul,' a coffee substitute; it contains vegetable proteins 40, vegetable fats 20 (97% of which are digestible), lecithin 2 and mineral ash 6. The mineral ash contains P compds. 30, K compds. 30, Mg 10 and Ca 5%. Narcotics, caffeine or carbohydrates are not present in Kaboul." - Chem. Abs. 30: 7717. November-December 1936.
242. Squirrell, W. J., and Laughland, J. Soybeans in Ontario. Ontario Dept. Agr. Bull. 366, 16pp. Guelph, 1932. 101 On8B
Harvesting, threshing, and uses of the crop, pp. 13-15.
243. Steece, Henry M. Soybean projects of the state agricultural experiment stations, 1937. 17pp., processed. [Washington, D. C.] U. S. Dept. of agriculture, Office of experiment stations, May 20, 1937.
1.9 Ex6So
"The entries in the list indicate the experiment station, the project title, leadership, station departments involved, cooperation with Bureaus of the Department of Agriculture, and if supported entirely or in part by Federal funds...
"This list supersedes a similar publication entitled Soybean Projects of the State Agricultural Experiment Stations, 1935-36 (March 14, 1936)." - Explanatory note.
244. Stehlé, H. Le soja. Revue Agricole [Guadeloupe] 7(9): 249-256. August 1935. 8 R327
Bibliography, p. 256.
Agricultural utilization, food value, industrial uses, and harvesting of the soybean are touched upon, among other things.
245. Stewart, C. L., Burlison, W. L., Norton, L. J., and Whalin, O. L. Supply and marketing of soybeans and soybean products. Ill. Agr. Expt. Sta. Bull. 386, pp. 425-544. Urbana, 1932.
Literature cited, pp. 541-542.

"The purpose of the present study has been to examine the supply situation with respect to both soybeans and soybean products, the present and potential markets for soybeans, the means and methods by which they are marketed, their economic characteristics in relation to improvements in marketing, and the influence of various factors on the prices paid for them...

"The information herein presented it is believed will be useful, not only as a basis for understanding the economic developments affecting soybeans in recent years, but also as a means of determining the tendencies which will count heavily in the future in establishing the place of this crop in the agriculture of the state." - p. 426.

Contains numerous tables and graphs showing prices for soybean products, and exports and imports for various countries.

Reviewed by R. B. J. in *Malayan Agr. Jour.* 21(9): 449-450. September 1933. 22.5 F312

246. Stewart, John R. The soya bean and Manchuria. *Far East. Survey* 5(21): 221-226. October 21, 1936. 280.9 In782

"Principal sources", p. 226.

"To observers of Far Eastern affairs, the significance of expanding American production of soya beans lies in the possibility of American competition with the Manchurian product. The growth of American production will not adversely affect Manchuria as long as the American beans are consumed within the country; for the United States has been in the past a very small purchaser of Manchurian beans and bean oil, which find Asiatic and European markets...

"It should be pointed out, however, that American production is possible of great expansion, for conditions in the Middle West are well suited to soya bean cultivation. Moreover, production costs by American methods of mechanized farming compare favorably with Manchurian costs, which are based on hand tillage..."

The reasons for Manchuria's success with the soybean and the situation and prospects with respect to the Manchurian industry are discussed.

247. Stewart, P. H., and Gross, D. L. Soybeans in Nebraska. *Nebr. Agr. Col. Ext. Circ.* 142, 5pp., processed. Lincoln, 1936. 275.29 N272Ex

"U. of N. Agr. College & U. S. Dept. of Agr. Cooperating."

Brings out acreage in Nebraska and adjoining states planted in soybeans; yields; harvesting; composition of soybean hay, grain and cake; and future possibilities for the crop.

248. Stietz, Erich. Die soja in der weltwirtschaft; ein beitrag zur ernährungs- u. rohstoffwirtschaft der erde. 46pp. Giessen, Druck der Buchdruckerei der Anstalt Bethel, Bethel bei Pielefeld, 1931. 60.3 St5

Dissertation - Giessen.

"Literaturverzeichnis", pp. 45-46.

This is a discussion of the soybean in world trade, and includes material on the history and botany of the bean, pp. 6-9; world production, pp. 9-11; international trade, pp. 28-34; the uses of the soybean, pp. 34-38.

249. [Sturtevant, Austin.] The soy bean - agriculture's "extra dividend." Grain & Feed Jours. Consolidated 75(9): 362, 369. Nov. 13, 1935. 289.8 G762

"The soy bean appears this year in the role of an 'extra dividend' to agriculture, and a boon to the grain trade. For the first time in agricultural history the bean attracts the attention of all handlers and merchandisers, according to Austin Sturtevant of Bartlett Frazier Co." The great increase in soybean production in this country, the value of the beans to the farmer and marketing methods and grades are touched upon.

250. Sumner, H. R. Growing soybeans in eastern Kansas. Kansas Agr. Col. Ext. Circ. 39, 7pp. Manhattan, 1923.

Briefly mentions value of the crop as grain and forage, harvesting, threshing and storing of seed.

251. Sweeney, O. R., and Arnold, Lionel K. Processing the soybean. Iowa State Col. Engin. Ext. Bull. 103, rev. 59pp. Ames [1935] (Official Publication, v. 34, no. 14. Sept. 4, 1935) 290.9 Ic94 no. 103

References, pp. 56-58.

"The purpose of this bulletin, which was first published in 1929, is to present information, particularly from an engineering standpoint, on the practicability of soybean oil production in the American Corn Belt, with special reference to the state of Iowa..."

The following phases of the subject are considered: characteristics of the soybean, its uses, place in Iowa agriculture, the soybean and the nitrogen, protein and vegetable oil problems, methods of producing soybean oil (including the hydraulic press and Anderson expeller methods, and the solvent extraction system), plant design, production costs and methods of calculating them.

Contains a list of unpublished theses presented for the B.S. degree to the Iowa State College of Agriculture and Mechanic Arts.

252. Tabor, Paul. Soy beans for Georgia. Ga. Agr. Col. Ext. Circ. 90, [4]pp. Athens, 1923.

The varieties best suited to Georgia, the effect of soybeans on the soil, and harvesting of the beans are discussed.

253. Thatcher, L. E. The soybean in Ohio. Ohio Agr. Expt. Sta. Bull. 384, pp. 51-68. Wooster, 1925.

Literature cited, p. 56.

Partial contents: Residual effect on soil fertility, pp. 34-36; Harvesting and threshing the grain crop, pp. 42-44; Making soybean hay, pp. 44-46; Soybean silage, p. 46; Varieties, pp. 46-48; Soybeans as an emergency crop, pp. 48-50; Corn and soybeans as mixed crop, pp. 50-54; Sudan grass and soybeans for hay, p. 54; Labor cost of producing soybean hay and seed, pp. 54-55.

The following tables are appended to the bulletin: 1. 9-year average yields of crops in various rotations - Wooster 1916-1924, inclusive; 2. Soil nitrates, soil moisture, and wheat yields following soybean hay cut at different dates; 3. Composition of soybeans harvested for hay at different dates, Wooster; 4. Nitrogen, phosphorus, potassium, calcium, and magnesium content of soybean hay and roots. Date-of-harvest test at Wooster, 2-year average percent, 1922-23; 9. Soybean varieties grown at Ohio state university, yield per acre; 10. Soybeans in variety test at Wooster: yield per acre; 11. Soybean hay in variety tests at Wooster: yield per acre; 12. Average yield of soybean seed in variety tests on experiment farms of the state; 13. Average yield of soybean hay in variety tests on experiment farms of state; 14. Corn and soybeans (grain), average per acre of triplicate test plots at Wooster, 1923; 15. Corn and soybeans (silage), average of triplicate test plots at Wooster, 1923; 16. Average expectancy of corn and soybean per acre based on 23 separate tests in Cornbelt states; 17. Ebony soybeans and Sudan grass mixture for hay, rate of seeding and yield per acre.

254. Thatcher, L. E. The status of the soybean crop in Ohio. Ohio Agr. Expt. Sta. Monthly Bull. 8(3-4, whole nos. 87-88): 59-63. March-April, 1923.

Gives the results of questionnaires mailed to 300 soybean growers of Ohio by the Department of Agronomy of the Ohio Agricultural Experiment Station, asking the status of the soybean crop on the farm. Yield per acre and cost of production are among the topics discussed.

255. Timberlake, E. M. Experience with soy beans. Rural New Yorker 93(5307): 660. Nov. 10, 1934. 6 R88

The writer has found that "the ordinary farmer can now engage in their production with no more risk than is involved in raising a crop of corn or wheat." He mentions the harvesting methods he has used, and the prices he has received for soybean hay.

256. Todd, G. R. Growing cow peas and soy beans. Rural New Yorker 82(4747): 846-847. June 16, 1923. 6 R88

The author finds that soybeans are superior to the peas for every purpose. He includes a paragraph on harvesting for seed.

257. Torres Herrera, José M. El haba soya, su cultivo y beneficio. [Nicaragua] Ministerio de Agricultura y Trabajo. Boletín de Agricultura y Trabajo 6, 3a. época (54): 24-25, 26; (55): 6-7, 8; (56-57): 6-10, 11-12. August-October/November 1934. 8 N51

The second installment briefly discusses seed production of the soybean, and yields of various varieties, and the third describes the harvesting of the crop, the many uses of the bean as human food, as forage, in mixtures with other crops, and as a green manure.

258. Towar, J. D. Cowpeas, soy beans, and winter vetch. Mich. Agr. Expt. Sta. Bull. 199, pp. 165-176. Agricultural College, 1902.
Soy beans, pp. 171-174, includes brief passages on harvesting the crop and the feeding value of the beans.
Also printed with Mich. Agr. Col. Ann. Rept. (1902) 15: 222-230.
259. U. S. Department of agriculture. Use native soy beans. Imported soy beans are mixture of many varieties and undesirable for seed. U. S. Dept. Agr. Weekly News Letter 4(47): 8. Washington, D. C., June 27, 1917. 1 Ag84W
Farmers are urged to buy native soybeans, as the Oriental ones are bought up by merchants and stored at railway stations, and no grading is attempted.
This same article, with minor changes in wording appears under the title "Imported soy bean seed" in U. S. Dept. Agr. Weekly News Letter 5(31): 4-5. March 6, 1918.
260. U. S. Department of agriculture, Bureau of agricultural economics. The soybean outlook. 4pp., processed. [Washington, D. C.] U. S. Dept. of agriculture, Bureau of agricultural economics, March 26, 1937. 1.9 Ec71Soy
"This report has been prepared with particular reference to the report of farmers' intentions to plant as issued March 19 by the Crop Reporting Board of the Bureau of Agricultural Economics."
"At present, the soybean situation is favorable to growers, with good prices being paid as a result of reduced production in 1936 and strong demand for both oil and meal. The immediate outlook is also satisfactory, with the seasonal demand for soybeans for seed purposes expected to offset the price-depressing effect of a possible decline in meal prices.
"For the last part of 1937, however, the outlook is less favorable..."
261. U. S. Department of agriculture, Bureau of plant industry. Soy bean. U. S. Dept. Agr. Dept. Circ. 120, 4pp. Washington, D. C. 1920. 1 Ag84D
Includes a brief description of the uses, the adaptation of certain varieties to certain uses, and harvesting of the soybean.
262. U. S. Department of commerce, Bureau of foreign and domestic commerce. Soya beans for American mills. U. S. Dept. Com., Bur. Foreign and Domestic Com. Com. Repts. no. 125, pp. 795-799. Washington, D. C. May 29, 1917. 157.7 C76D

This article includes a report from A. A. Williamson, who discusses the Manchurian soybean industry with reference to the possibility of soybean imports for use in American mills.

263. U. S. Department of commerce, Bureau of foreign and domestic commerce, Far Eastern division. Oil and oilseeds of the Orient. U. S. Dept. Com., Bur. Foreign and Domestic Com. Com. Rept. no. 33, pp. 611-616. Washington, D. C., Feb. 8, 1919: 157.7 C76D

The writer reviews the importance of the soybean in the Far East, its cultivation and harvesting in China, preparation of bean curd, marketing oil in China, Japanese production and exports to the United States, increasing production in China, and imports of soybean oil to the United States. He concludes that "American importers of Far Eastern products may well investigate the domestic market for Far Eastern oilseeds with a view to supplying oil mills in the United States with raw material."

264. U. S. Department of commerce and labor, Bureau of manufactures. Soya bean and products. U. S. Dept. Com. and Labor Spec. Cons. Repts. 41, pt. 5, 35pp. Washington, D. C., 1909. 157.7 C76S

Erroneously numbered Special Consular Reports, vol. XL.

"In compliance with requests from manufacturers of cotton-seed products in the United States, who desired that an investigation be made of the production and use of the soya bean and its manufactures in the Far East and of the extent to which they compete with American cotton-seed products in the European markets, the reports following have been submitted by consular officers in the various countries concerned...

"The reports of the consular officers have been placed in two groups, the first having to do with the countries that produce the soya bean and the second with the countries that are sought as markets. Statistics as to the imports of soya-bean products in many European countries were not available at the time the reports were submitted, but inasmuch as the prices quoted were generally lower than for other seed products, emphasis has been laid upon the relative merits of the two classes of goods as shown by experiments and analyses in these countries. These features will indicate the lines along which American cotton-seed manufacturers will have to work in meeting this new competition." - Introduction, p. 3.

265. U. S. Tariff commission. Summary of tariff information, 1920; prepared for the use of the Committee on ways and means, House of representatives. 1004pp. Washington, Govt. print. off., 1920. 173 T17Su

Chinese soy sauce, p. 322; Paragraph 606, Act of 1913, given on pp. 779-780, contains a description of the soybean, its uses, production, and import quantities, and the tariff regulations applicable to the various soy products.

266. U. S. Tariff commission. Summary of tariff information, 1921, relative to the bill H. R. 7456. 1625pp. Washington, Govt. print. off., 1922. 173 T17Su
- "The principal sources of information have been the commodity surveys and reports of the Tariff Commission, especially the 'Summary of Tariff Information, 1920.' The material in the latter has been amplified and brought up to date."
- Soybeans are more specifically dealt with in the 1920 Summary. Soybean oil, however, is considered in H.R. 7456. "Soya-bean Oil," p. 152, gives a description of and the uses, production and imports of the product, and points out that while it was exempt from duty under the Act of 1913 (par. 561) it is dutiable under the emergency tariff act of 1921 (par. 11).
267. U. S. Tariff commission. Summary of tariff information, 1929 on Tariff Act of 1922. Schedule 1. Chemicals, oils, and paints, compiled by the United States Tariff Commission and printed for the use of the Committee on ways and means, House of representatives. 419, xvpp. Washington, U. S. Govt. print. off., 1929. 173 T17Su
- Soy-bean Oil, pp. 283-284, briefly gives some of the uses for the oil, production in the United States, imports into the United States, exports, cost of production, prices and competitive conditions.
268. The useful soya bean. Commercial possibilities. Liverpool Trade Rev. 26(12): 245-247. Dec. 15, 1927. 287 L753
- "Compiled from a report prepared by Mr. A. Grenville Turner, of Messrs. Kelly & Company...Liverpool." - Note.
- Describes the increasing importance and production of soybeans in the United States, and their food and industrial uses.
269. Vandenburg, J. T., Jr. Soybeans as a farm crop. Soybeans have many valuable uses in agriculture and commerce. Penn State Farmer 22(5): 9, 13. February 1929. 276.8 P38
- "The raising of soybeans is not a new thing, even in this country, but before going into the more descriptive phases of the industry, it might be well to discuss the facts relative to their introduction and development in the United States, and see if the factors which have made them so popular in other sections are equally applicable to Pennsylvania conditions."
270. Viljoen, N. J. An investigation into the composition of the soybean in South Africa. Union of South Africa Dept. Agr. and Forestry. Sci. Bull. 169, 68pp. Pretoria, Printed in the Union of South Africa by the Government printer, 1937. (Chemistry Series No. 151) 24 So84S
- Bibliography, pp. 66-68.
- Thesis (Doctor of Science) - University of Pretoria, 1936.
- Introduction, pp. 5-8, takes up the uses for the soybean and its place in various countries.

271. Virginia. Department of agriculture and immigration. The soy bean. Va. Dept. Agr. and Immigr. Bull. 118, pp. 4-6. Richmond, 1917. 2 V81B
Includes brief paragraphs on the history of the soybean, its harvesting, and use as human food.
272. Voorhees, John H. The soybean in New Jersey. N. J. Agr. Expt. Sta. Circ. 21, 8pp. [New Brunswick, 1913?]
The uses of the soybean, harvesting and threshing, and its feeding value are considered.
273. W. Die sojabohne und ihre verwendung in der nahrungsmittelbranche. Konserven-Zeitung 14(48): 377-378. Nov. 28, 1913. 389.8 K83
"A brief account of the history, nutritive value, and utilization of the soy bean." - Expt. Sta. Rec. 30: 760. 1914.
274. Wand, Frederick A. Handling and preparing soybeans for market. Grain & Feed Jours. Consolidated 68(3): 145. Feb. 10, 1932. 298.8 G762
Harvesting at a time to secure the lowest moisture content, proper handling in storage, and use of the combine in harvesting, are suggested.
275. Wand, Frederick A. The soybean industry. Farmers' Elevator Guide 22(12): 50-51. December 1927. 280.28 Am3
The author includes a discussion of the value of soybeans as a soil builder, the increase in soybean acreage in Illinois, the marketing of soybeans, and soybeans and the tariff.
276. Wand, Frederick A. The soybean industry in this country. Grain World 100(11): 11-12. Sept. 26, 1928. 286.8 C49
The writer takes up the marketing of soybeans and their manufacturing possibilities and points out that "every acre planted to soybeans means one less acre of surplus crops, such as corn, wheat and oats."
277. Ware, A. M. The soya bean. So. Aust. Dept. Agr. Jour. 41(1): 50-52. August 1937. 23 So8J
Harvesting and uses of the bean for food are briefly discussed.
278. Weed, A. R. Soy beans a standard Illinois crop. Orange Judd Farmer 69(32): 795. Sept. 15, 1921. 6 Orl
A description of the second annual corn belt soybean day held at Champaign and Tolono, Illinois, on September 1st. The uses of the bean and methods of handling on Meharry Farm were among the matters demonstrated.
279. Westbrook, E. C. Results with special crops in the Piedmont section in 1922. Ga. Agr. Col. Ext. Circ. 89, 4pp. Athens, Ga., 1923. 275.29 G

"In an effort to determine which crops were showing the greatest promise in the Piedmont section a brief survey was made in December to find out what returns the farmers had gotten from special crops in 1922." Soybeans are given, p. 2.

280. Whittle, Charles A. Why soy beans? So. Fert. Assoc., Soil Improvement Com. Circ. 3, 4pp. Atlanta, Ga. [19--?] 57.9 So8

The use of the soybean as flour and as a milk in human nutrition, its use as a stock feed and in industry, the increasing demand for the beans in this country, and yields and returns are briefly outlined.

281. Wiancko, A. T., and Fisher, M. L. Soy beans, cowpeas, and other forage crops. Ind. Agr. Expt. Sta. Bull. 120, pp. 439-460. Lafayette, 1907.

Part I. Soy Beans and Cow Peas, gives an historical summary of the two crops, and describes their uses and value, culture, harvesting and threshing, and costs of production.

282. Wiancko, A. T., and Croner, C. O. Soybeans in Indiana. Ind. Agr. Expt. Sta. Bull. 238, 16pp. Lafayette, 1920.

The value and uses, both farming and industrial, of the crop, their place in the rotation, harvesting and threshing, and varieties to be planted for various purposes, are among the subjects taken up.

283. Wiancko, A. T. Soybeans in the Corn belt. Field Illus. 32(4): 205-207. April 1922. 42.8 Sp6

The advantages of planting soybeans in the crop rotation, the prices obtained for grain and seed, uses of the crop, and its future prospect as a commercial crop are discussed.

284. Wiggins, R. G. Cayuga soybean: a home-grown high-oil high-protein concentrate. N. Y. (Cornell) Agr. Expt. Sta. Bull. 601, 32pp. Ithaca, 1934.

References, pp. 31-32.

The author takes up the place of the soybean in United States and in New York agriculture, the composition and digestibility of ground soybeans, the monetary value of one bushel of soybeans, results in soybean feeding trials with dairy cattle, the history, description and chemical composition of the Cayuga soybean, the residual effect and fertilizer effects of soybeans, harvesting, threshing and handling of the grain.

285. Wiggins, R. G. Varietal experiments with soybeans in New York. N. Y. (Cornell) Agr. Expt. Sta. Bull. 491, 19pp. Ithaca, 1929.

The bulletin contains sections on soybean production in the United States, the utilization of soybeans, the results of the varietal experiments in terms of green and dry-weight yields and yield of threshed grain. Table 8, p. 19, gives the best varieties for New York to be grown for hay, grain and green manure when the factors of yield, cost of seeding, habit of growth, length of growing season, and availability of seed are considered.

286. Wilkins, F. S. Buying soy bean seed. Wallaces' Farmer 46(14): 613.
Apr. 8, 1921. 6 W15
Indications, evidenced by the fact that soybean seed prices are higher than those of corn and small grain, point to a scarcity of northern grown soybean seed. Advice is given to buyers of seed.
287. Wilkins, F. S. Growing soy beans as a cash crop. Soy bean meeting in Missouri shows opportunities for wider use of crop. Wallaces' Farmer 47(42): 1232. Oct. 20, 1922. 6 W15
Soybeans as a cash crop was one of the subjects discussed at a meeting of farmers and experiment station workers interested in soybeans, in September. The speakers included Professor J. C. Hackleman, W. E. Riegel, D. D. Taylor (The Possibility in Soy Bean Production for Oil Markets from the Manufacturer's Viewpoint), L. P. Nenzek, and Alex. W. Beemer.
288. Wilkins, F. S. Soybeans in the Cornbelt. A legume that is easily grown and yields well. Successful Farming 20(3): 5, 92-93.
March 1923. 6 Sul2
The author points out the increasing acreage planted to soybeans in the Corn Belt, and the advantages and uses of the crop.
289. Wilkins, F. S. Soybeans in the Cornbelt. Wallaces' Farmer 45(15): 1081, 1093. Apr. 9, 1920. 6 W15
"Soy beans are growing in popularity in the corn belt at a very rapid rate. Reports from eighty-two county agents show that there were over five times as many soy beans grown in their counties in 1919 as in 1918, and these same county agents state that indications are favorable for a still greater increased acreage in 1920 if seed can be obtained...Farm Bureau reports show that 89 per cent of the soy beans grown in 1919 were seeded with corn." The uses of the crop and harvesting methods are included in the discussion.
290. Wilkins, F. S. Soybeans to replace oats. Even thin, acid soils can grow soys. Wallaces' Farmer 55(15): 742, 762. Apr. 12, 1930.
6 W15
"In any event we are conservative when we say that soybeans can be used profitably to replace part of the oat acreage, on nearly all farms."
291. Wilkins, F. S. Where soybeans replace oats. Wapello county, Iowa, community finds soys yield more and pay better. Wallaces' Farmer 53(12): 477. Mar. 23, 1928. 6 W15
Experience of Washington township, Wapello county, with soys.
292. Williams, C. B. Soybean growing in North Carolina. N. C. Agr. Col. Ext. Circ. 127, rev., 19pp. Raleigh, 1929.
Besides cultural methods, the circular takes up the harvesting

of soybeans for hay and seed; their uses for soil improvement, soiling purposes and pasturage; utilization of the soybean crop in the United States and in North Carolina by percentages; cost of growing the beans; the crushing of the beans from the standpoint of millmen and farmers; the products secured by oil mills in crushing; the amounts millmen can afford to pay for beans; possibilities for the future use of soybean oil and meal; and the advantages to farmers of soybeans over other oil-bearing seed crops.

293. Williams, C. B. Soy bean growing in North Carolina. N. C. Agr. Expt. Sta. Circ. 31, 8pp. Raleigh and West Raleigh, 1915.

A brief history of the soybean crop throughout the world, the value of soybeans in mixtures, harvesting for hay and seed, soybeans for soil improvement, for soiling purposes and for pasturage are included.

294. Williams, C. B. Soy beans for seed. Country Gent. 81(35): 1592. Aug. 26, 1916. 6 C833

"Although the soy-bean crop will in all probability find its greatest usefulness for soil-improving purposes, and to a less extent for pasturage purposes, there is no question that under average conditions there will be developed a considerable seed industry." Harvesting and curing the seeds are briefly discussed.

295. Williams, C. B. Soy beans in North Carolina. Country Gent. 81(14): 738. Apr. 1, 1916. 6 C833

This is a brief summary of the soybean situation in North Carolina, the amount produced, the uses to which it is put, and the value of the crop as imported into this country from the Orient.

296. Williams, C. G., and Park, J. B. Soybeans: their culture and use. Ohio Agr. Expt. Sta. Bull. 312, pp. 577-600. Wooster, 1917.

This Bulletin is made up of two articles: Soybean Culture, by C. G. Williams, and Uses of Soybeans, by J. B. Park.

The first article points out the amount of soybean production in Ohio and the place of the soybean in Ohio agriculture, and includes information on harvesting methods of soybeans for hay, for silage, and for seed. It also discusses the varieties for various purposes and their yields, and the effect of soybeans in crop rotations.

The second article takes up the uses of soybeans for animal food, the special uses for meal and oil, and the uses of the beans for human consumption. Charts show the pounds of digestible protein in 100 pounds of soybeans as compared with salmon (canned), veal cutlets, beef (round), beans (navy), ham (smoked), ham (fresh), eggs (uncooked), wheat flour, corn meal, rice, milk (skimmed), milk (unskimmed), and potatoes; and the relative quantities of each of these products that may be bought for a dollar.

An extract of this bulletin appears in Internatl. Inst. Agr. Rome Internatl. Rev. Sci. and Pract. Agr. 10(3): 285-287. March 1919. 241 In82

An extract of C. G. Williams' paper entitled "Harvesting Soybeans. Special Care Needed in Cutting and Curing the Crop", is printed in Ohio Agr. Expt. Sta. Monthly Bull. 2(8, whole no. 20): 253-254. August 1917.

An extract of J. B. Park's paper entitled "Soybeans as Human Food. Palatable Dishes Made from a Comparatively New Legume", is printed in Ohio Agr. Expt. Sta. Monthly Bull. 2(9, whole no. 21): 299-303. September 1917.

297. Williams, Thomas A. The soy bean as a forage crop. U. S. Dept. Agr. Farmers' Bull. 58, 24pp. Washington, D. C., 1899. 1 Ag84F

Discusses the general characteristics and origin of the soybean, its varieties, harvesting, yield, chemical composition, digestibility, and value and uses.

The appendix, pp. 20-23, is an article entitled "Soy Beans as Food for Man" by C. F. Langworthy. Tables give a chemical analysis of various varieties of soybeans, a chemical comparison of soybean milk and cows' milk, and the composition of food products made from soybeans.

298. Wilson, Harry D. Soy beans. 7pp. [Baton Rouge? La., 1916?] Pam. Coll. 60.3 W

Soybeans as a crop for Louisiana are advocated. It is pointed out that soybeans give a greater yield of meal than, and as much oil as cotton seed.

299. Winters, R. Y., and Herman, V. R. Soybeans for the Piedmont and mountain sections of North Carolina. N. C. Agr. Col. Ext. Circ. 111, 15pp. West Raleigh and Raleigh, 1921.

The varieties suited to the sections studied, the use of soybeans in the rotation, use for hay and seed production, soil improvement, and cultural methods are brought out.

Tables show comparative yields of hay from cowpeas and soybeans, and the comparative food content of soybean hay and red clover, alfalfa, oat and cowpea-hays.

300. Woertge, Karl Heinz. Entwicklung und weltwirtschaftliche bedeutung der sojabohnenerzeugung und -verarbeitung. 118pp. Coburg, 1937. 281.360 W82

Inaug. -diss. -Erlangen.

Bibliography, pp. 115-118.

This is a study of the soybean, its production, its importance in world economy, and the utilization of its derivatives. A brief outline of the history of the soybean in the United States is given, pp. 24-25, historical development of soybean culture in single states, pp. 25-27, the foreign trade of the United States in soybeans, pp. 75-76, in soybean oil, pp. 90-91, and in soybean cake, p. 100.

301. Woods, Charles D., and Bartlett, J. M. Soy beans in Maine. Maine Agr. Expt. Sta. Bull. 106, pp. 113-121. Orono, 1904.
"Because of numerous inquiries, the Maine station has experimented somewhat with this crop. The results of these experiments are here reported and there are also included such deductions and citations from Farmers' Bulletin 58 and the publications of the Massachusetts and Storrs stations as seem adapted to Maine climate and conditions." Harvesting, yield, nutrients in the soybean, soybean silage, and yield of dry matter and protein are discussed.

302. Worden, A. M. What is the most profitable method of handling soy beans? Prog. Farmer (Miss. Valley ed.) 34: 1045. June 21, 1919.
Not examined.

303. Zahnley, J. W. Soybean production in Kansas. Kans. Agr. Expt. Sta. Bull. 249, 31pp. Manhattan, 1930.

The following summary is given:

"1. The soybean is adapted to the eastern three or four tiers of counties in Kansas. Drought and rabbits are the principal hindrances to growing it farther west. 2. It is adapted to about the same general conditions as corn, but will produce a fair crop on land which is too poor to raise good corn. It will also grow on soils that are too acid for alfalfa or sweet clover. 3. No other crop in Kansas will produce so much protein per acre as the soybean. The seed may be substituted for the expensive protein concentrates as cottonseed or linseed meal or it may be marketed as a cash crop. 4. Soybean hay compares favorably with alfalfa or clover in feeding value and may be used to supplement a shortage of alfalfa in the eastern third of the state. 5. When grown as a companion crop with corn and pastured off a better balanced feed is produced on which sheep or hogs make good gains with a saving of the cost of harvesting..."

COST OF PRODUCTION AND RETURNS

304. Barlow, Floyd F. Some interesting experiences with the soy bean crop in New Jersey. Soy beans still an experimental crop in the northern states - how one farmer produced them, and what it cost - the immediate factors to be considered in threshing. Trib. Farmer 12(610): 1. July 10, 1913. 6 N484
Detailed cost figures are presented.

305. Barr, Harold T. Corn and soybean production. La. Agr. Expt. Sta. Bull. 253, [4]pp. Baton Rouge, 1934.
Includes a section on the harvesting of soybean seed, and gives a tabular summary of labor and power to produce the crop.

306. Butler, William Reynolds. The labor-saving soy. A crop for seed, feed and the soil of run-down fields. Country Gent. 81(19): 964-965, 994-995. May 6, 1916. 6 C833
The financial importance of the soybean crop is emphasized, and figures on expenses and profits from a soybean demonstration given by Herman Hughel in 1914 are reproduced.
307. Farver, Warner E. Cost of soy-bean hay. Natl. Stockman and Farmer 42(50): 1234-1235. Mar. 8, 1919. 6 N21
The writer analyzes the costs of producing soybean hay and clover hay, and concludes that although soybeans are the more expensive to produce, other advantages outweigh that factor.
308. Farver, Warner E. Soybean hay and feeding costs. Ohio Farmer 140 (19, whole no. 3635): 427. Nov. 10, 1917. 6 Oh3
"Everybody knows the place wheat bran has in many rations, and also the price it generally has. When we consider that the analyses of bran and soybean hay are practically the same, and that 1 1/2 to two tons of soybean hay can be raised per acre, we see why so many successful feeders use it."
309. Greene, R. E. L. Cost of producing farm products in North Carolina. N. C. Agr. Expt. Sta. Bull. 305, 127pp. Raleigh, 1936.
Cost of Producing Soybeans, pp. 85-88, has the following tables: Labor and material requirements per acre for production of soybeans; Cost per acre of producing soybeans; Labor requirements by operation per acre on soybeans. Figures apply to Craven County only.
310. Harvey, T. Weed. Pays net return of \$43.17 per acre. Soybean crop makes a neat profit for the Indiana farmer - special method of culture. Farm Life 34(8): 9. August 1915. 6 F2238F
Figures are cited for cost of production, gross return and net return.
311. Johnson, O. R., and Green, R. M. Cost of producing some Missouri farm crops. Mo. Agr. Expt. Sta. Bull. 165, 26pp. Columbia, 1919.
Cost of producing soybeans, pp. 20-22.
"A preliminary report on these studies has been made in Bulletin 125 of this Experiment Station. Additional and more detailed information on the cost of horse labor is presented in Bulletin 152...This publication is intended to give a rather condensed statement of crop production costs as determined up to this time."
312. Johnson, O. R., and Foard, W. E. The cost of production on Missouri farms. Mo. Agr. Expt. Sta. Bull. 125, pp. 285-316. Columbia, 1915.
The cost of producing farm crops, pp. 302-309, includes figures and discussion on the cost per acre of producing soybeans, and the profit per hour man labor.

313. Kentucky. Agricultural experiment station. Hogging down experiments. Kentucky Agr. Expt. Sta. Ann. Rept. (1919, pt. 1) 32: 39-40. Lexington, [1920].
Gives costs and profits of hogging down corn alone, hogging down corn and allowing the hogs the run of a self-feeder of tankage, hogging down of corn and soybeans grown together, hogging down soybeans alone, and hogging down soybeans and feeding corn in a self-feeder.
314. Kidder, A. F., and Dalrymple, W.H. "Hogging down crops." Cost of producing crops and pork. La. Agr. Expt. Sta. Bull. 187, 19pp. Baton Rouge, 1923.
In the course of the studies it was found that "corn and soy beans gave the cheapest gains when 'hogged down' in comparison with corn and cowpeas, corn, soy beans and sweet potatoes, sweet potatoes and soy beans and sweet potatoes alone. With corn and soy beans, the cost of producing 100 pounds of feed amounted to 2.9 man hours and 4.6 horse hours and the cost of producing 100 pounds of pork was 13.6 man hours and 21.6 horse hours... Soy beans should be substituted for cowpeas in south Louisiana..."
315. Mathews, I. J. Some soybean experiences. Actual results with an important crop. Successful Farming 19(4): 12, 73. April 1920. 6 Sul2
Costs, yields and profits are discussed with reference to specific cases.
316. Montgomery, Cary W. Factors affecting labor and miscellaneous costs of producing crops. Ohio Agr. Expt. Sta. Monthly Bull. 5(5, whole no. 53): 154-158. May 1920.
Tables show a comparison of rotations: five-year average yield and value per acre, 1915-1919 at the Northeastern Test Farm, and crop costs and net receipts per acre for 1917, 1918, and 1919. Soybean hay is included.
317. New Jersey Agricultural experiment station. Rye straw and soybeans. N. J. Agr. Expt. Sta. Rept. (1914)35: 204-205. New Brunswick, 1915.
Thirty-fifth annual report of the New Jersey State Agricultural Experiment Station, and the Twenty-seventh annual report of the New Jersey Agricultural College Experiment Station.
The report of the Department of Farm Crops, includes a summary report for soybeans, showing total value of crop, total cost, total profit, average cost and profit per acre and average yield per acre, in a growing of rye straw followed by soybeans for seed as a two-crop proposition.
318. New Jersey Agricultural experiment station. Soy beans for seed. N. J. Agr. Expt. Sta. Rept. (1913)34: 403-405. New Brunswick, 1914.
Thirty-fourth annual report of the New Jersey State Agricultural Experiment Station and Twenty-sixth annual report of New Jersey Agricultural College Experiment Station.

The report of the Department of Farm Crops gives figures on value of crop, total cost, total profit, and average profit per acre.

319. Osterberger, C. L. Producing corn and soybeans with mechanical power. Agr. Engin. 10(6): 201-202. June 1929. 58.8 Ag83
"Paper presented at a joint meeting of the Southern and South-west Sections of the American Society of Agricultural Engineers at Houston, Texas, February, 1929."
"The object of the study was to determine the practicability and economy of tractors and tractor equipment in producing corn and soybeans on the alluvial or bottom lands of Louisiana..."
Power and labor costs for producing the crops are discussed and summarized in a table.
320. Osterberger, C. L. Utilization of power and power equipment in corn and soybeans. Assoc. South. Agr. Workers Proc. (1929) 30: 44-48. Atlanta, Ga., 1929. 4 C82
"The object of the study...is to determine the practicability and economy of tractors and tractor equipment in producing corn and beans on our alluvial or bottom lands..."
Equipment used and costs per acre in labor and power are discussed. Table I. Labor and power summary, gives costs for various operations.
321. Phillips, Thomas D. Soybeans in rotation. Ohio Farmer 137(13, whole no. 3550): 455. Mar. 25, 1915. 6 Oh3
An account of an experiment at the Ohio State University farm in 1915. Includes a statement of the labor costs to produce the crop.
322. Rauchenstein, Emil, and Ross, R. C. Cost of producing field crops in three areas of Illinois, 1913-1922. Ill. Agr. Expt. Sta. Bull. 277, pp. 37-67. Urbana, 1926.
Table, p. 44, gives a "Summary of cost accounts on crops, Franklin county, 1913-22", which includes data for soybean hay, 1920-22; and table, p. 48, gives a "Summary of cost accounts on crops, Champaign and Piatt counties, 1920-1922", which has figures for soybeans for 1922.
323. Ross, R. C. Soybean costs and production practices. Ill. Agr. Expt. Sta. Bull. 428, pp. 341-388. Urbana, 1936.
"The present study was...undertaken in order to ascertain what the detailed costs are that enter into the production of this crop on Illinois farms; the effects which different practices used in growing and harvesting have upon yields and costs; and the probable place of soybeans in corn-belt farming."

324. Rozul, J. B. Cost of production of soy bean (*glycine hispida*).
Philippine Agr. 26(5): 475-476. October 1937. 25 P542
Abstract by Felix J. Madrid, of thesis presented for the degree
of Bachelor of Agriculture no. 675; Experiment Station contribution
no. 1192.
This is the cost of production under Los Baños conditions.
325. Soybean grower combines at low cost. Wisconsin Agriculturist and
Farmer 58(40): 12-13. Oct. 3, 1931. 6 W751
Contains cost figures of 1930 soybean crop of 80 acres of one
farmer in Illinois.
326. Young, E. C., and Hobson, L. G. Costs and profits in producing soy-
beans in Indiana. Ind. Agr. Expt. Sta. Bull. 306, 28pp.
Lafayette, 1926.
"...This study was made with the purpose of determining the
most economic methods of producing soybeans for grain and hay
and also to determine to what extent soybeans could be profit-
ably fitted into the general farming plan...
"One hundred and four farmers furnished detailed information
upon costs and methods of soybean production on their farms for
the 1923 crop. One hundred and seventy-seven farmers furnished
similar information for the 1924 crop...In addition to securing
the dollar costs of soybean production care was taken to obtain
quantities of labor and materials used in order that the study
might have a permanent value...
"The farms studied were located in ten counties in central
Indiana as shown by the map (Figure 1)."
327. Young, E. C., and Hobson, L. G. Costs and profits in producing soy-
beans in north central Indiana, crop of 1923. Ind. Purdue
Univ. Dept. Agr. Ext. Leaflet 144, 6pp. Lafayette, 1926.
The leaflet brings out certain facts of value to soybean
producers, from a study of "detailed cost records for the soybean
crop of 1923...obtained on 104 farms in Cass, Carroll, Howard and
Miami counties, by the Purdue University Agricultural Experiment
Station".

GRADING AND STANDARDIZATION

328. Barr, J. E. Marketing soybeans basis U. S. standards. 6pp., processed.
Washington, D. C., U. S. Dept. of agriculture, Bureau of agricul-
tural economics, 1932. 1.9 Ec712Ms
Address delivered at the annual meeting of the American Soybean
Association, Washington, D. C., September 3, 1932.
The writer reviews the construction of the standards, and
describes the work of the soybean inspection service of the Bureau

of Agricultural Economics, the export of soybeans and the problems which arise, the handling of soybeans through terminal elevators, and suggested changes of U. S. standards.

A part of this article is printed in the Grain and Feed Jours. Consolidated 69(7): 346. Oct. 12, 1932, under the title: Proposed Changes in Soy Bean Grades Analyzed. 298.8 G762

Essentially the same material is printed in Grain and Feed Jours. Consolidated 72(2): 74. Jan. 24, 1934, under the title: Marketing Soybeans. 298.8 G762

329. Barr, J. E. Soy-bean standards promulgated for commercial crop. U. S. Dept. Agr. Yearbook, 1926, pp. 675-676. Washington, D. C., 1927.
"With the commercial supply of a comparatively new agricultural product increasing there naturally arises a problem in marketing. Although there may be an adequate outlet or market for the crop, a definite basis for price quotations is essential in order to insure more equitable returns to the producer and to expedite movement of the crop from the farms. Uniform quality standards are the key to the solution of this problem." - p. 675.
330. Chicago inspectors licensed to sample soy beans. Grain Dealers Jour. 63(11): 754. Dec. 10, 1929. 298.8 G76
The rapid growth of Chicago as a soybean market, the licensing of inspectors from the Chicago Board of Trade Sampling Department by the federal government, the increase in uses for the soybean, and the uses for the oil and meal are discussed.
331. Definitions of soybean products. Grain & Feed Jours. Consolidated 69(10): 473. Nov. 23, 1932. 298.8 G762
Gives the definitions adopted for standard soybean products at the annual meeting at Chicago of the National Soybean Oil Manufacturers Association.
332. Minneapolis. Board of grain appeals. Minnesota grain grades for the 1937-38 crop year as established by the Minnesota Boards of grain appeals. 47pp. [Minneapolis, Minn., 1937] Pam. Coll. (Grain Grades. Minnesota)
These standards are the same as the Federal ones.
333. New Soybean com'ite of Nat'l ass'n. Grain & Feed Jours. Consolidated 76(3): 111. Feb. 12, 1936. 298.8 G762
"S. W. Wilder, pres. of the Grain and Feed Dealers National Ass'n, has appointed a soybean com'ite...
"The com'ite will look into the charge of \$4 for federal appeal on soybeans, compared with \$1.50 for appeal on grains, will consider the transfer of soybean grading from the hay, seed and feed service to the grain division of the Bureau of Agricultural Economics, a change in the rules for grading, and the establishment of a futures market."

334. Soya bean standards are proposed by U. S. bureau. Oil, Paint and Drug Reporter 106(18): 20. Oct. 27, 1924. 306.8 O15
"Tentative gradings for soya beans have been issued by the Bureau of Agricultural Economics, United States Department of Agriculture...in the hope that they will be tried out in connection with the marketing of this year's crop, and in order to get data on possible revision of the tentative standards before they are officially and finally promulgated for application to next year's crop."
335. Soy-bean adulteration. Country Gent. 90(35): 52. September 1925.
6 C833
An account of the South Carolina false-label soybean seed fraud.
336. Soybean inspection to remain separate from Grain grades act. Grain & Feed Jours. Consolidated 76(6): 228. Mar. 24, 1936. 298.8 G762
"The resolutions adopted by the Illinois Farmers Grain Dealers Ass'n and the Indiana Grain Dealers Ass'n urging that soybean inspection be placed under the Grain Standards Act have been considered by A. G. Black, chief of the Bureau of Agricultural Economics, who explains in a letter to Fred K. Sale, sec'y of the Indiana Ass'n that the placing of soybean grading under the same authority would require an amendment to the Act." Mr. Black's letter is given in part.
337. Soybeans and their inspection. Grain & Feed Jours. Consolidated 66(5): 321. Mar. 11, 1931. 298.8 G762
The inspection of soybeans through the U. S. Bureau of Agricultural Economics is discussed, and the need for developing new uses for soybean oil and meal is pointed out.
338. U. S. Department of agriculture, Bureau of agricultural economics. Handbook of official hay standards...revised, effective April 1, 1936. 62pp. Washington, U. S. Govt. print. off., 1936. (Form HFS-540-Rev.) 1 Ec7Ha
Soybean and Soybean Mixed Hay, pp. 29-31, has class and grade requirements for soybean hay.
339. U. S. Department of agriculture, Bureau of agricultural economics. Handbook of official United States standards for soybeans, effective September 3, 1935. 20pp. Washington, U. S. Govt. print. off., 1935. (Form HSF-1663) 1 Ec7Hs 1935
Contents: Promulgation of standards, p. 1; Definitions, pp. 2-3; Classes of soybeans, p. 4; Grade requirements, p. 5; Important features of official United States soybean standards, pp. 6-11; Application of official United States soybean standards, p. 11; Federal soybean inspection service, pp. 11-20 (includes discussion of Federal-State inspection, qualifications of inspectors, federal soybean inspection certificates, methods of inspection, methods of sampling, soybean triers or probes, appeal

inspection, who receives certificates, fees and charges, and how to obtain inspection).

Earlier editions of the standards were issued in 1928 (as Handbook of United States standards for soybeans effective September 1, 1926. 20pp. Washington, U. S. Govt. print. off., 1928. (Form HSF-899) 1 Ec7Hs) and in mimeographed form in 1924 (as Tentative Grades for Soybeans. 4pp., processed. Washington, D. C., Oct. 1, 1924); in 1925 (as United States Standards for Soybeans. Effective September 1, 1925. 3pp., processed. [Washington, D. C., 1925]). This was revised, effective September 1, 1926. 3pp., processed. Washington, D. C., 1926; and again, effective September 3, 1935. 3pp., processed, under title: Official Standards for Soybeans (HFS-1663). 1.9 Ec74So

340. U. S. Department of agriculture, Bureau of agricultural economics. Soybean appeal inspection procedure... 3pp., processed. [Washington, D. C., Sept. 15, 1937; 1.9 Ec712So

Instructions for soybean shippers, dealers and processors, giving procedure in handling appeals under the Federal soybean inspection service.

341. U. S. Department of agriculture, Bureau of agricultural economics. Soybeans inspected by federal licensed inspectors. 1p., processed. Washington, D. C., 1932-1934. 1 Ec712So

These have appeared for Dec. 7, 1932; March 9, 1933; Dec. 6, 1933; and April 6, 1934.

Contain statistics giving soybeans inspected for export and at interior markets, though figures for export not always given.

342. U. S. Department of agriculture, Bureau of agricultural economics. Tentative United States standards for soybean and soybean mixed hay, issued November 1928. 1p., processed. [Washington, D. C., 1928.] 1.9 Ec74So

"These standards have been prepared for the purpose of providing a definite basis of quality for use in marketing of Soybean and Soybean Mixed Hay... Uniform standards will assist materially in stabilizing the industry, in promoting better production methods, and in developing more extensive marketing of Soybean and Soybean Mixed Hay in regions of present or potential surplus production. Such use will demonstrate the practicability of these standards before they are made a part of the Official Hay Standards of the United States."

HARVESTING

343. Alabama. Agricultural experiment station, Department of agronomy and soils: Soybeans. Ala. Agr. Expt. Sta. Leaflet 2, 4pp. Auburn, 1934.

Harvesting, pp. 3-4.

344. Albrecht, William A. When to cut soybean hay. *Successful Farming* 28(8): 9. August 1930. 6 S12
"The proper season for making soybean hay is that time when the pods are formed and just beginning to fill."
345. Beeson, K. E. Solving "soy" problems. *Ind. Farmer's Guide* 87(37): 773. Sept. 12, 1931. 6 In2
"When and how to harvest is important in handling this hay and bean crop."
346. Bledsoe, R. P. A grille for threshing soybean selections. *Ga. Agr. Expt. Sta. Circ.* 85, 4pp. Experiment, 1929.
The writer describes the grille, and its construction. Illustrations are included.
347. Borst, H. L., and Thatcher, L. E. Life history and composition of the soybean plant. *Ohio Agr. Expt. Sta. Bull.* 494, 96pp. Wooster, 1931.
Literature cited, pp. 95-96.
Part II. Yield and composition of soybeans at various stages of maturity, by L. E. Thatcher, pp. 51-94. It is stated that "Soybeans may be harvested for hay at several stages of maturity. The stage of maturity may affect the yield, quality, and composition of the hay and the weight and composition of the roots and stubble remaining in the soil. The effect of time of harvest upon these factors was investigated at Wooster during the 6-year period 1922-1927, inclusive."
348. Briggs, George M. Making soy bean hay. *Hoard's Dairyman* 68(5): 101, 118. Aug. 15, 1924. 44.8 H65
Methods of harvesting the soybean crop for hay are discussed.
349. Cates, J. Sidney. New stunts in harvesting soys. Cheaper ways to handle the job are being worked out. *Country Gent.* 88(28): 5, 30. July 14, 1923. 6 C833
"This is one of a series of articles gathered...from every part of the United States...for the purpose of suggesting to farmers ways of increasing their income." - Note.
350. Combining soybeans in the South. Atlantic seaboard states find use for the combine. *Amer. Thresherman* 33(8): 7. December 1930. 58.8 Am32
The article quotes statements by D. S. Weaver of the North Carolina State College, Ray W. Carpenter of Maryland, and B. G. Locher of Virginia on the harvesting of soybeans, and the tests conducted by Prof. D. C. Heitshu of the Virginia Experiment Station are mentioned.
351. Cutler, G. H. Improvement for soybean bar cylinder thresher. *Amer. Soc. Agron. Jour.* 25(5): 362-363. May 1933. 4 Am34P

"A soybean bar cylinder thresher, a description of which appeared in this Journal, Volume 21, pages 377-378, has been improved so as to increase its general efficiency. Some of the improvements that have been effected are as follows..."

352. Cutting and threshing soybeans. Slow cylinder speeds recommended. Amer. Thresherman 28(3): 7. July 1925. 58.8 Am32
Methods used in harvesting hay and seed are outlined.
353. Dunton, H. L., and Megee, C. R. Curing soy bean hay. Mich. Agr. Expt. Sta. Quart. Bull. 16(4): 254-257. East Lansing. May 1934.
Describes various methods of curing and the results secured from each.
354. Farver, Warner E. Soy beans for seed. Natl. Stockman and Farmer 43(24): 646. Sept. 13, 1919. 6 N21
Describes harvesting methods of soybeans for seed.
355. Gray, R. B. Combining soybeans in the South. Agr. Engin. 14(4): 93-94. April 1933. 58.8 Ag83
"Paper presented at a meeting of the Power and Machinery Division of the American Society of Agricultural Engineers held at The Stevens, Chicago, November 1932."
Gives the results of observations made in the Mississippi Delta by the United States Department of Agriculture Bureau of Agricultural Engineering "on the operation of typical 10 ft. grain combines, complaints having been made that these machines could not be used to harvest beans in that section."
356. Heitshu, D. C. Soybean harvesting methods in Virginia. Agr. Engin. 9(7): 209-214. July 1928. 58.8 Ag83
Report of investigation conducted by the Virginia Agricultural Experiment Station and the U. S. Department of Agriculture to study "the comparative merits of the different soybean harvesting methods practiced during the season of 1927. The methods observed during this study were (1) the cut and thresh, (2) the row harvester, (3) the broadcast harvester, and (4) the combine."
357. Helm, C. A. Growing soybeans for hay. Mo. Agr. Col. Ext. Leaflet 26, [2]pp. Columbia, 1928.
Includes a paragraph on harvesting and curing for hay.
358. Hosterman, W. H. Harvesting and curing soy bean hay. Natl. Hay Assoc. Rept. (1935)42: 26-31. 286 N21
The history of the soybean as a hay crop, its value as an emergency hay crop, and methods of harvesting and curing it are given.
A brief discussion follows the paper.

359. Juday, C. B. Development of combine reduces soybean losses. Purdue Agr. 29(1): 1, 9. October 1934. 6 P97
Gives advantages of using the combine and costs of harvesting with it.
360. Justice, J. L. Cutting and threshing soy beans. Country Gent. 84(8): 60. Feb. 22, 1919. 6 C833
Methods of carrying out the process.
361. Justice, J. L. Methods of cutting soy beans. Hoard's Dairyman 58(3): 90. Aug. 8, 1919. 44.8 H65
Advantages and disadvantages of various methods.
362. Justice, J. L. Saving soy bean crop. Orange Judd Farmer 63(8): 2, 7. Aug. 25, 1917. 6 Orl
Harvesting and threshing methods are outlined.
363. King, B. M. Soybean hay production. Mo. Agr. Col. Ext. Circ. 336, 4pp. Columbia, 1936.
Harvesting soybeans for hay, pp. 3-4.
364. Lehmann, E. W., and Blauser, I. P. Combines in Illinois. Ill. Agr. Expt. Sta. Circ. 316, 16pp. Urbana, 1927.
Points out among other things, the savings in harvesting soybeans with the combine, and offers a table showing the amount and quality of crops, including soybeans, harvested with fifty-two combines in Illinois in 1926.
365. McCuen, G. W. Hints for soybean threshing. Ohio Farmer 152(8, whole no. 3938): 158. Aug. 25, 1923. 6 Oh3
"While the acreage of soybeans in Ohio has increased greatly during the past year, the threshing facilities in the field have not kept any where near abreast with the increased acreage." The power required in threshing beans and other considerations are taken up.
366. Martin, Brice. Harvesting soybeans. Small combine harvester cuts loss in threshing. Wallaces' Farmer 50(47): 1522. Nov. 20, 1925. 6 W15
Percentages lost in harvesting with different machines are cited.
367. Mayer, I. D. Harvesting soybeans with the combine. Agr. Engin. 10(2): 52. February 1929. 58.8 Ag83
"A contribution to the symposium, entitled 'New Developments in Combine Harvesting and Grain Drying,' presented at a meeting of the Power and Machinery Division of the American Society of Agricultural Engineers, at Chicago, December, 1928."
Advantages of the combine for harvesting soybeans are cited. It is said to save more beans, result in a higher quality product, and reduce costs of harvesting.

368. Miller, E. E. When the soy beans are harvested. Country Gent. 82(28): 1141. July 14, 1917. 6 C833
Harvesting methods are discussed.
369. Morse, William Joseph. Harvesting soy-bean seed. U. S. Dept. Agr. Farmers' Bull. 886, 8pp. Washington, D. C., September 1917. 1 Ag84F
The author discusses the advantages of the soybean as a seed crop, the methods of harvesting, the methods of curing and handling, threshing, special bean harvesters, the value of soybean straw, and the storage of seed.
370. Mumm, Walter J., and Winter, Floyd L. A bar-cylinder soybean thresher. Amer. Soc. Agron. Jour. 21(3): 377-378. March 1929. 4 Am34P
Describes a thresher built at the Illinois Agricultural Experiment Station to meet the need for one that "would thresh out the beans without any loss, and at the same time would avoid any mixtures or seed injury."
371. New harvester-thresher solves problem. Power Farming 35(10): 8, 12. October 1926. 58.8 T41
This is a description of "a new type of power-driven combine soybean harvester" which was demonstrated at the Delta Experiment Station, Stoneville, Mississippi, before the American Soybean Association's 7th annual field meeting. The harvester makes it possible to harvest "25 to 35 acres of soybeans in a ten hour day."
372. Oldenburg, F. W. Soybeans for hay and seed. Md. Agr. Col. Ext. Circ. 106, 8pp. College Park, 1934.
Harvesting soybeans for seed, p. 7; Threshing, p. 7; Special soybean harvesters, p. 8.
373. Park, J. B. Harvesting soybeans for seed. Ohio Agr. Col. Ext. Serv. Crop Talk 1, [4]pp. Columbus, 1923. 275.29 Oh33
Takes up the time of harvesting, methods of harvesting, special soybean harvesters, threshing, and storage of seed.
374. Pate, W. F. Soybean harvesters. N. C. Agr. Col. Ext. Circ. 56, 8pp. Raleigh and West Raleigh, 1917.
Description, with numerous illustrations, of machines suitable for harvesting soybeans.
375. Pate, W. F. Soybean harvesters. N. C. Agr. Col. Ext. Circ. 80, 8pp. Raleigh and West Raleigh, 1918.
This circular is similar in material to Extension Circular 56, 1917, but contains in addition questions and answers on six types of harvester given in tabular form.

376. Reynoldson, L. A., Humphries, W. R., and Martin, J. H. Harvesting small grain, soybeans, and clover in the corn belt with combines and binders. U. S. Dept. Agr. Tech. Bull. 244, 55pp. Washington, D. C., 1931. 1 Ag84Te
"It is the purpose of this bulletin to present the necessary data and to make comparisons between different harvesting methods in order to assist farmers who are considering the purchase of a combine for harvesting their various crops. The information on which the comparisons are based was obtained from farmers in Illinois, who operated combines or binders, by the United States Department of Agriculture, cooperating with the agricultural colleges and experiment stations of Illinois and Indiana." - p. 2.
Contains statistical tables, among which is one showing charges per acre for harvesting different crops with different methods (including soybeans).
377. Reynoldson, L. A. Harvesting soy beans. A radio talk delivered through Station WRC and 31 other stations associated with the National Broadcasting Company, September 9, 1929. 2pp., processed. Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, Division of farm management and costs, September 9, 1929. 1.9 Ec7Ra
Results and costs of harvesting with the combine.
378. Simpson, W. F. An economic study of methods of harvesting soybeans for seed. Amer. Soc. Agron. Jour. 17(9): 557-567. September 1925. 4 Am34P
"Contribution from the Department of Agronomy, Virginia Polytechnic Institute, and Agricultural Experiment Station, Blacksburg, Virginia. Abstract from minor thesis submitted in partial fulfillment of the requirements for the degree of Master of Science..."
Literature cited, p. 567.
"The object of this investigation, conducted in 1924, was to study soybean harvesting methods and equipment with special reference to: (1) waste of seed in harvesting, (2) cleanliness of the seed saved, (3) damage to the seed, (4) rate of harvesting, (5) cost of harvesting, and (6) the factors affecting successful harvesting."
379. Swingle, F. B. Machines increase soy bean profits. Amer. Thresherman 32(8): 4. December 1929. 58.8 Am32
"Growers in Champaign, Piatt, and other [Illinois] counties where soy bean acreage is greatest in extent, have demonstrated what modern tillage and harvesting machinery will do to reduce time and labor spent in planting and harvesting, at the same time insuring more efficient seasonable plowing, seed bed preparation, planting and harvesting."
380. Uhland, R. E. Time of harvesting soybeans in relation to soil improvement and protein content of the hay. Mo. Agr. Expt. Sta. Bull. 279, 28pp. Columbia, 1930.

"The recent increase in the soybean acreage in Missouri, the possible future increase, and the irregularity in times of harvest indicate the necessity of knowing something about the yield and composition of soybeans at different stages of growth as a means of determining the proper time to harvest soybeans for maximum results in terms of hay, seed, and soil improvement." The tests reported include the results of four years work from 1924-1928.

381. U. S. Department of agriculture. Handy helps in harvesting soy beans increase crop's food and forage value. U. S. Dept. Agr. Weekly News Letter 7(10): 6. Washington, D. C. Oct. 8, 1919. 1 Ag84W
"With the widely increased popularity of the soy bean the harvest of the crop has gained markedly in importance in practically every section of the country. According to specialists of the United States Department of Agriculture the fact that practical and satisfactory bean harvesters are now on the market at comparatively reasonable prices and are efficient for harvesting the crop either when grown under level or ridged-row methods of cultivation, greatly increases the value of this crop not only as a forage for live stock but also for human food purposes."
Methods of harvesting are described.
382. U. S. Department of agriculture. Threshing and storing to save soy-bean seed. U. S. Dept. Agr. Weekly News Letter 7(17): 4. Nov. 26, 1919. 1 Ag84W
This article gives methods of threshing and storing the soy-bean seed so as to prevent deterioration and loss, since it is now "of considerable value."
383. Van Doren, C. A., and Burlison, W. L. Cutting soybean harvesting costs. Amer. Thresherman 34(5): 6, 11. September 1931. 58.8 Am32
Harvesting with the combine was found to be cheaper under Illinois conditions than with the binder and grain separator.
384. W., J. The combine harvester moves to Iowa. How it is handling soybeans on the [Raymond] Warren farm in Wapello County. Wallaces' Farmer 51(46): 1474. Nov. 12, 1926. 6 W15
385. Weber, B. T. Soy beans for seed. Rural New Yorker 95(5355): 130. Feb. 8, 1936. 6 R88
Methods of harvesting the crop for seed are brought out.
386. Wettach, Melville. Soy beans for the Corn belt. Hoard's Dairyman 65(12): 434. April 6, 1923. 44.8 H65
Includes a brief passage on harvesting the crop.
387. Wilkins, F. S. Harvesting and threshing soy beans. Wallaces' Farmer 45(39): 2243. Sept. 24, 1920. 6 W15
The grain binder is suggested for harvesting soybeans for seed.

388. Willard, C. J. Harvesting soy beans for hay. Hoard's Dairyman 70(6): 145. Aug. 21, 1925. 44.8 H65
Methods of handling the crop are discussed.
389. Willard, C. J., Thatcher, L. E., and Park, J. B. Harvesting soybeans for hay. Ohio Agr. [Expt.] Sta. Bimonthly Bull. 175, pp. 148-154. Wooster, July-August 1935.
The effect of time of cutting and method of curing on soybean hay are discussed.
390. Willard, C. J. Time of harvesting soybeans for hay and seed. Amer. Soc. Agron. Jour. 17(3): 157-168. March 1925. 4 Am34P
"Contribution from Department of Farm Crops, The Ohio State University, Columbus, Ohio..."
The study includes tables showing yields of soybeans at different periods of maturity, 1919-1922; and other data concerning soybeans at different periods of maturity, 1919-1922.
391. Williams, C. B. Harvesting soy beans. Prog. Farmer 33: 349. Mar. 16, 1918.
Not examined.
392. Wolfe, T. K. Soybean culture. Va. Agr. Expt. Sta. Bull. 235, 32pp. Blacksburg, 1924.
Harvesting for hay, pp. 24-26; Harvesting for silage, pp. 26-28; Harvesters, pp. 28-31; Comparison of soybeans and cowpeas, p. 32.

MARKETING

393. Begin trading in soybean futures. Grain and Feed Jours. Consolidated 77(7): 301. Oct. 14, 1936. 298.8 G762
Describes the market at the opening on October 5th of the first future trading market in soybeans on the Chicago Board of Trade.
394. Blythe, Stuart O. Selling soys. Country Gent. 87(34): 7, 24. Sept. 30, 1922. 6 C833
Contains a description of the methods used by the Linn County (Missouri) Soybean grower's association in selling soybeans.
395. Burns, C. C. Farmers to market soybeans. Illinois cooperative formed to handle crop. Wallaces' Farmer 55(3): 100-101. Jan. 18, 1930. 6 W15
"A membership campaign to sign up the entire soybean crop in the highest producing region in the United States is the object of the new Soybean Marketing Association, organized and incorporated at Decatur, Ill..."

"The Association will begin the cooperative marketing of soybeans as a commodity with the 1930 crop."

The membership, organization, operation and general aims of the association are explained.

396. Chicago Board to vote on soybean futures. Grain & Feed Jours. Consolidated 77(6): 239. Sept. 23, 1936. 298.8 G762
Describes the work and results of investigation by the committee appointed by the Chicago Board of Trade to study the desirability of establishing a futures market for soybeans.
397. Christian, C. F. Newton follows the in-and-out method. He aims to be in the market when other fellows are out. Successful Farming 24(1): 13, 78. January 1926. 6 Sul2
C. B. Newton's methods of harvesting the soybeans and selling them by mail are described.
398. Clemmons, J. G. Soy bean marketing. Grain & Feed Jours. Consolidated 66(6): 375, 376. Mar. 25, 1931. 298.8 G762
Abstract of address "before Illinois Farmers Grain Dealers Ass'n."
Handling and conditioning the crop, the commercial position of the soybean, and the demand for seed are considered. It is stated that "we are now faced with the problem of setting up a regular channel such as we have in grains, thru which soybeans may be marketed."
399. Connecticut. Department of agriculture, Bureau of markets. Connecticut seed law rules and regulations with suggestions for the retailer, wholesaler and farmer by Francis H. Adams. Conn. Dept. Agr. Bull. 49, 27pp. Hartford, 1937.
"Agricultural seeds" are defined as including soybean seed (p. 3).
400. Contracting soy beans. Grain Dealers Jour. 63(5): 335. Sept. 10, 1929. 298.8 G76
Reproduces the contract forms to be used by the Archer-Daniels-Midland Co., of Minneapolis, Minn., and country grain elevator operators having soybean growers in their territory. "In effect and in fact this contract guarantees the grower of soy beans a definite price per bushel, which may encourage farmers to contract acreage that needs rotating and would normally go to oats."
401. Flax plantings smaller this year. Soya bean plantings for oil and meal will be 25% larger than in 1930. Chemicals 35(15): 21. April 13, 1931. 306.8 C42
"The outlets for oil and meal will determine the extent to which the production of soybeans for milling purposes may profitably expand...There is but little hope of a marked increase in the market outlets for soybean products in the near future..."

402. James, Delos L. Teamwork helps Illinois farmers. Nation's Business 16(11): 106-107. October 1928. 286.8 N212

The writer describes the agreement entered into by the American Milling Co., of Peoria and allied interests and Illinois farmers "to buy 1,000,000 bushels of soy beans from this year's crop at a guaranteed price of \$1.35 for No. 2 beans, f.o.b. Peoria and Bloomington." This is a minimum price, at which the farmer is not required to sell if he can get more elsewhere for seed or commercial purposes, after first giving the Associated Companies a chance to buy at the higher prices offered. The plan thus guarantees a price to the farmer in advance of planting.

403. Johnson, E. F. Elevator men easily handle soybeans. Grain & Feed Jours. Consolidated 74(4): 162. Feb. 27, 1935. 298.8 G762

Abstract of address "before Indiana Grain Dealers Ass'n."

Elevator men are urged to handle soybeans and encourage the commercial growing of the crop in their territory.

404. Kansas. State grain inspection dept. Laws and rules of the Kansas State grain inspection and weighing department, governing inspection and weighing of grain, soy beans and flaxseed, together with their standards and grades. 62pp. Topeka, Printed by Kansas State printing plant, W. C. Austin, state printer, 1934. 280.359 K132L

Standards for soy beans, pp. 45-48, includes definitions, classes of soy beans, important features of U. S. soy bean standards, application of soy bean standards.

405. Lien-en, Tsao. The marketing of soya beans and bean oil. Chinese Econ. Jour. 7(3): 941-971. September 1930. 280.8 C442

The amount of Manchurian soybean production as compared with the other leading soybean producing countries, and a discussion of the marketing of soybeans, cake and oil on the world market, are included.

406. Lloyd, J. H. Soybean production and marketing. Ill. Farmers' Inst. Ann. Rept. (1931) 36: 112-120. 4 I162

In this talk are considered the importance of the soybean as a world crop, its utilization, processing methods, value of the oil and meal, contract buying of commercial beans as an important factor in the rapid development of the industry, the work and organization of the Soybean Marketing Association, its 1930 marketing deal, prices and production costs of soybeans, the co-operative marketing principles which are an object of the Soybean Marketing Association, the need for tariff protection, and the commercial soybean outlook.

407. McGuire, W. C. Growing and handling soybeans. Grain Dealers Jour. 64(4): 271. Feb. 26, 1930. 298.8 G76

Abstract of address "before Illinois Farmers Grain Dealers Ass'n."

The writer discusses the handling of soybeans "as an elevator proposition", and doubts that the contracts at present in use between growers and processors will last long. He expects a selling of soybeans on a purely supply and demand basis, and suggests tariff protection on the product.

408. Malott, Deane W. Problems in agricultural marketing. 410pp. New York, London, McGraw-Hill book co., 1938. 280.3 M29
Ch. III. Organization and Operation of the Futures Exchanges, pp. 85-111, contains a section, pp. 98-105, on the establishment of the soybean futures market on the Chicago Board of Trade which became operative October 6, 1936.
409. National soybean processors association. Trading rules of the National soybean processors association. Rules to govern purchase and sale of soybean oil [1930-1937]. 14pp. [n.p., 1937?] 307 N21
Includes rules and forms of contracts, standard specifications for purity and quality of crude domestic raw soybean oil, rules for quantity, price, terms of payment, inquiries and quotations, time of shipment and carrying charge, weights, routing, tank cars, commission or brokerage, arbitration, contingencies, and the amendment of these rules.
410. Norton, L. J. The soybean marketing outlook. Ill. Agr. Col. Ill. Farm Econ., nos. 28-29, p. 133. Urbana, September-October, 1937. 275.28 I15
"The outlook information in this issue is based upon reports issued by the Bureau of Agricultural Economics, U. S. D. A." - Ed. note.
It is pointed out that any material advances in soybean prices seem improbable unless Manchurian supplies are cut off, and with regard to price decline that "soybeans have been more stable in price in the last month than other grains, indicating a firmer basis under the market." Scarcity of lard might also keep up the price for vegetable oils, but "should the financial weakness continue as indicated by declining prices for securities, it will have a depressing influence on prices of both soybeans and corn."
411. P., C. Soybeans in the United States and Manchoukuo. Far East. Survey 4(18): 145-146. Sept. 11, 1935. 280.9 In782
"There is every reason to believe that an export market may be developed in time. The American bean was favorably received in Europe, as the quality was considered very good. But the European demand is for a heavy constant tonnage, and it will probably be some years before the United States will have an export supply which can compete with that of Manchoukuo in quantity and price."

412. Pittman, Lawrence. Handling soybeans. Grain Dealers Jour. 62(3): 169. Feb. 10, 1929. 298.8 G76
Abstract of an address before Illinois Farmers Grain Dealers Association at Joliet.
Discusses contracts for soybeans being made between milling companies and elevators.
413. Setnitskii, N. A. Soya beans on the world market, with a supplement of an article in the English language: "Manchuria and the world market for soya beans." 335pp. Harbin, 1930. 60.3 Se7
At head of title: Economic Bureau, Chinese Eastern Railway.
Text and added t.-p. in Russian; English Suppl., pp. 309-355.
Title of the supplement: Manchuria and the World Market for Soya Beans. The following footnote is appended: "The present article, in its considerable part, is the conclusion of a book named 'Soya Beans upon the World Market' by N. A. Setnitzky."
The United States as a market for Manchurian soybean oil, is briefly mentioned, p. 318, and the increased area of soybeans under cultivation in the United States, is brought out, p. 325.
414. Soybean industry looks up. Producers organize co-operative to assist in developing new markets. Bur. Farmer (Ill. Agr. Assoc. Sec.) 5(3): 9-10. November 1929. 280.82 B89
Describes the organization and methods of operation of the Soybean Marketing Association, and briefly mentions the grading of beans according to federal standards, the higher profits of soybeans over oats, and the development of new uses for soybeans.
415. Soybean sits pretty. Becomes so important that Chicago Board of Trade may establish futures trading. Business Week (362): 21-22. Aug. 8, 1936. 280.8 Sy8
The uses for the soybean in industry, reasons for the increase in 1935 acreage, and competition of the oil with tung oil are mentioned.
416. Speculative soybeans. Grain & Feed Jours. Consolidated 78(1): 13. Jan. 13, 1937. 298.8 G762
This is a discussion of the condition of soybeans on the Chicago futures market.
417. Steen, Herman. Taking out the gamble. Wallaces' Farmer 53(50): 1736. Dec. 14, 1928. 6 W15
"Crop contracting was tried out on a large scale in Illinois this year with soybeans, based on a guaranteed price by three large buyers. This effort in price stabilization resulted in doubling the soybean acreage, netted the growers a substantial advance over prices prevailing in other years for commercial beans, and gave manufacturers enough beans to operate close to capacity for the entire year."

418. Stewart, Charles L., and Whalin, Oren L. Le commerce international des fèves de soya et de leurs sous-produits. Revue Économique Internationale, 25 année, v. 2, no. 3, pp. 543-562. June 1933. 280.8 R32

A discussion of international trade in soybeans and soybean products, in which are brought out the various uses for the soybean, trends in production and international trade, restrictions affecting international trade in the soybean and its products, and an estimation of the present and future international trade in them.

419. U. S. Congress, Senate Committee on agriculture and forestry. Amendment of Agricultural marketing act; hearing, 72nd cong., 1st session on S. 3680, a bill to amend the Agricultural marketing act approved June 15, 1929. February 18, 1932. 78pp. Washington, U. S. Govt. print. off., 1932. 280.3 Un37Am

Statement of Earl C. Smith, President Illinois Agricultural Association, pp. 58-65, includes discussion of the soybean crop, which, he says, has become "one of the big cash crops of the Midwest." He makes the following statement:

"Therefore, we believe that the equalization fee, from the standpoint of the exportable surplus, should be applied so as to make the tariff operative from the standpoint of controlling seasonal surpluses of these great cash crops. If cooperative marketing is to do the thing that I am sure is intended in law, we have got to arrange so that the charge for commodity control, surplus control, shall be spread over each unit of the commodity that is benefited."

OIL, PROTEIN AND MOISTURE CONTENT

420. Chiu, Y. T. A simple method for the determination of oil in soybeans or soybean milk. Lingnan Sci. Jour. 10(1): 130-131. April 1931. 22.5 C16

Includes percentages of oil found in six soybean varieties by this method as compared with the Soxhlet method.

421. Coleman, D. A., and Boerner, E. G. The Brown-Duvel moisture tester and how to operate it. U. S. Dept. Agr. Dept. Bull. 1375, 44pp., rev. Washington, D. C., 1927. 1 Ag84B

Issued February 1926; Revised December, 1927.

The testing of soybeans by this method is included.

Revised Methods for Operating the Brown-Duvel Moisture Tester, by D. A. Coleman, and H. C. Fellows. 4pp., processed. [Washington, D. C.] U. S. Dept. of agriculture, Bureau of Agr. Econ. [July 1935.] Supplement to Department Bulletin 1375.

422. Coleman, D. A. Efficiency of electric moisture testers. Farmers' Elevator Guide 33(2): 34-36. Feb. 5, 1938. 280.28 Am3

"To date the research work of the U. S. Bureau of Agricultural Economics has shown that the electric moisture meter is the nearest approach to a precise device and method for determining the moisture content of grain that is practical for a large majority of the moisture tests required by modern conditions of grain inspection and grain commerce."

This tester may be used for soybeans.

423. Coleman, D. A., and Fellows, H. C. Handbook of instructions for the installation and operation of the Tag-Heppenstall moisture meter. 93pp., processed, rev. Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, Grain division, July 1936. (USGSA-MB1-1 Revised) 1.9 Ec72Ha 1936

Part V. Special Problems in Moisture Testing, includes, p. 39, instructions for soybeans. Conversion charts XLII and XLIII, pp. 90-91, apply to soybeans.

424. Coleman, D. A., and Fellows, H. C. A simple method for determining the oil content of seeds and other oil-bearing materials. U. S. Dept. Agr. Tech. Bull. 71, 14pp. Washington, D. C., 1928. 1 Ag84Te

"In the search for a rapid, safe, and accurate test for the oil content of seeds and other oil-bearing materials for general use, the optical method applied to cottonseed products by Wesson was found most promising. The procedure necessary in the application of the optical method to a number of commodities was worked out in the grain-research laboratory of the Bureau of Agricultural Economics, and a standard practice for each is recommended. By this method determinations can be made in 15 minutes, at a cost for materials of less than 1 cent per test, which agree very closely with those obtained by the standard ether-extraction method." - Summary, p. 13.

The test is used for soybeans as well as other grains.

425. Cox, C. H. Soy bean analysis. Oil and Soap 13(7): 167-168. July, 1936. 307.8 J82

Paper presented at the Spring Meeting of the American Oil Chemists' Society, New Orleans, May 28 and 29, 1936.

Describes the analysis of soybeans for oil mill purposes, including moisture determination, ammonia determination, oil content, free fatty acid content and the final calculation of results. A sample analysis is given.

426. Ginsburg, Joseph M., and Shive, John W. The influence of calcium and nitrogen on the protein content of the soybean plant. Soil Sci. 22(3): 175-197. September 1926. 56.8 So3

"Paper No. 273 of the Journal Series, New Jersey Agricultural Experiment Station, Department of Plant Physiology."

"The purpose of these experiments is, therefore, two-fold: First, to determine whether there exists a definite relation between calcium and nitrogen in plant metabolism. Secondly, to ascertain whether the increased nitrogen found in plants as a result of lime application is in the form of protein or non-protein nitrogen."

427. Hall, Wallace L. Some analyses of commercial soybeans. 5pp., processed. [Washington, D. C.] U. S. Dept. Agr. Bur. Agr. Econ. [1937].
1.9 Ec712Ss

"Presented before the Paint and Varnish Division of the American Chemical Society at Chapel Hill, North Carolina. April 12-15, 1937."

"Literature cited", p. 5.

"In the final analysis the chemical research data should substantiate inspection procedures which, by necessity, must be simply and quickly applied. That is, those quality factors used by the inspector in standardization practice must stand trial and prove their merit as against such evidence of quality as may be obtained through the longer and more complicated physical and chemical analyses. The method of approach to the problem under discussion has been to separately analyze split, damaged, and whole sound beans and compare the data. In this paper the data relate primarily to certain chemical studies upon crude oil and, to a lesser extent, upon crude protein obtained from the general run of commercial soybeans."

Includes tables and maps.

428. Janieson, G. S., Baughman, W. F., and McKinney, R. S. Oil content of nine varieties of soybean and the characteristics of the extracted oils. U. S. Dept. Agr. Jour. Agr. Research 46(1): 57-58. Washington, D. C., Jan. 1, 1933. 1 Ag84J

Gives the results of an investigation in a table: Chemical and physical properties of soybeans and their oils.

429. Jolson, L. Dosage de l'humidité dans les fèves de soja. Mémoires de l'Université d'État à l'Extrême-Orient. 13(6): 1-23. 1929.
Not examined.

"From a study of drying at 100-5° and at 120-60°, of distn. in presence of xylene, and of the effects of the fineness of grinding, wt. of samples and temp. and time of drying, J. concludes that all 3 methods give satisfactory results provided the conditions are properly selected and strictly adhered to. He recommends grinding to pass a 1.5-2.5 mm. mesh sieve and drying 5 g. for 20 min. at 130°. Drying at 100-5° requires 5-8 hrs. and should not be continued to const. wt." - Chem. Abs. 25: 2207. May-August 1, 1931.

430. Jones, D. Breese, and Csonka, Frank A. Soybeans content of amino acids varies greatly with variety. U. S. Dept. Agr. Yearbook, 1934: 330-332. Washington, D. C., 1934. 1 Ag84Y
"Recent studies in the Bureau of Chemistry and Soils on the proteins of soybeans have disclosed the fact that different horticultural varieties of the same seed may show differences in the amino acid composition. In view of the great increase in the production of soybeans in the United States during recent years, any significant difference in the food value of one variety over another becomes a matter of importance."
431. Lebedev, A. N., and Pereverzeva, T. V. Methoden der feuchtigkeitsbestimmung in sojabohnen. Moscow. Zentrales Biochemisches Forschungsinstitut der Nahrungs- und Genussmittelindustrie. Schriften 1(5): 200-210. 1931. 389.9 M85
Text in Russian. Alternate titles and summary in German.
Describes methods for the determination of moisture in soybeans.
432. Lebedev, A. N., and Alexandrow, W. Die vergleichenden untersuchungen über die methodik der asche- und phosphorbestimmung in den sojabohnen. Moscow. Zentrales Biochemisches Forschungsinstitut der Nahrungs- und Genussmittelindustrie. Schriften 1(6): 265-284. 1932. 389.9 M85
Text in Russian. Alternate titles and summary in German.
Comparative researches on the procedure for determining ash and phosphorus in soybeans.
433. Leith, B. D. Fluctuating variations in the soy bean. Amer. Soc. Agron. Jour. 16(2): 104-108. February 1924. 4 Am34P
"The interesting fact is that in oil and protein content and in iodine number, the fluctuations from year to year have been large, and that only within rather wide limits have they been consistent in a certain direction between varieties in a single year..."
Observations were made on results in varietal experiments at the Wisconsin University Department of Agronomy, begun in 1911.
434. Lipman, Jacob G., Blair, Augustine W., McLean, Harry C., and Wilkins, Louis K. Factors influencing the protein content of soy beans. N. J. Agr. Expt. Sta. Bull. 282, 14pp. New Brunswick, N. J., 1914.
"Part of this material appears in the annual report for 1913-1914." N. J. Agr. Expt. Sta. Ann. Rept. (1914) 35: 207-245. 1915.
"During the summer of 1914 a number of pot experiments were conducted to determine the influence of different factors, as for example, fertilizer treatment, thickness of planting, time of harvesting, etc., on the protein content of soy beans..."

435. Lipman, Jacob G., and Blair, A. W. Factors influencing the protein content of soybeans. *Soil Sci.* 1(2): 171-178. February 1916. 56.8 So3
Continuation of work begun in summer of 1914, an account of which was given in the Annual Report of the New Jersey Experiment Station for that year.
436. McKinney, R. S., Cartter, J. L., and Jamieson, George S. The determination of the oil content of soybeans. *Oil and Soap* 11(12): 252, 261. December 1934. 307.8 J82
"A contribution from the Oil, Fat and Wax Laboratory, Bureau of Chemistry and Soils, and Division of Forage Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture."
"It is concluded from the results of this investigation that the double extraction of the undried ground sample with petroleum ether is the only reliable procedure available for the determination of the oil content of soybeans."
437. Mashino, Minoru. Studies of the soya-bean proteins. *Soc. Chem Indus. Jour. Trans.* 54: 236T-238T. July 12, 1935. 382 M31
"This paper is a summary of the studies of the author and collaborators, T. Shishido, S. Nishimura, and T. Iinuma, carried out in the Tokyo Industrial Research Institute, and published in the Reports of the same Institute, and also in the Journal of the Society of Chemical Industry, Japan, issued between 1926 and 1933, in the following order: (1) The purification of soya-bean oil cakes. (2) The improvement of soya-bean oil extraction. (3) The decomposition and decomposition products by hydrolysis of soya-bean protein. (4) The properties of soya-bean proteins."
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440. O'Kelly, J. Fred, and Gieger, M. Effect of variety, maturity, and soundness on certain soybean seed and oil characteristics. Miss. Agr. Expt. Sta. Tech. Bull. 24, 10pp. State College, Miss., 1937.
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"The investigations reported here were made with southern soybean varieties grown under southern conditions in an effort to determine how characteristics, including fat constants, of such varieties may differ and how they may be changed by stage of maturity when harvested and by decay." - Introduction, p. 1.
The same title is in Assoc. South. Agr. Workers Proc. 34-36 (1933-35): 460. 4 C82
An abstract of an address.
441. Parker, Edward C. Importance of oil and protein content in evaluating soybeans. Grain & Feed Jours. Consolidated 69(7): 346. Oct. 12, 1932. .298.8 G762 ;
Speech before the American Soybean Association.
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442. Scheunert, A., and Schieblich, M. Über den vitamengehalt frischer sojabohnen. Biedermanns Zentralblatt. Abteilung B: Tierernährung 7(2): 198-204. April 1935. 384 B47T
Contains short summary in English, p. 204.
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Literature cited, p. 645.
Fertilizer treatment and soil type, geographical location, and variety characteristics are studied in relation to the composition of soybeans. Experiments were carried out at the Illinois Agricultural Experiment Station.
444. U. S. Department of agriculture, Bureau of agricultural economics. Protein tests for wheat and oil tests for flaxseed and soybeans. Importance in production and marketing. U. S. Dept. Agr. Misc. Pub. 140, 45pp. Washington, D. C., 1932. 1 Ag84M
Literature cited, p. 45.
Oil content of soybeans, p. 41, points out the wide variation in oil content of the beans and the importance of the oil; Oil-testing service and surveys in relation to market practices, pp. 42-43, emphasizes the need for oil tests for oil-bearing seeds;

Permissive principles for protein and oil-testing service, p. 44, concludes that "An effective protein and oil-testing service, accompanied by comprehensive protein surveys of the wheat crops and oil surveys of the flaxseed and soybean crops and by a market-news service pertaining to protein and oil premiums, supplies, and market requirements, should be of distinct benefit to the grain industry, especially to producers and country shippers."

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"Litteratuur", p. 896.
"Review of the literature in regard to the bean, as food for man and animals and technical value of the fat, with some new analysis of the bean showing high protein (35.4%) and fat (17%) content; physical constants of the oil and of the fatty acids; analysis of the meal left after oil extraction; protein (40.5%), fat (5.8-6.25%). Its ash has a high P_2O_5 value (29-36%)." - V. E. Henderson. Chem. Abs. 5(22): 3737. Nov. 20, 1911.
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Tables show protein and oil contents.

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447. Baker, O. E., and Genung, A. B. A graphic summary of farm crops (based largely on the Census of 1930 and 1935). U. S. Dept. Agr. Misc. Pub. 267, 129pp. Washington, D. C., 1938. 1 Ag84M
Maps, pp. 74-76, show soybean acreage (grown with other crops), 1929, production of soybeans in bushels, 1929, acreage of soybeans grown alone, 1929, increase in soybean acreage, 1919-29, increase in soybean acreage, 1929-34, and decrease in soybean acreage, 1929-34.
448. Capone, Giorgio, and Grinenco, Ivan. Oleaginous products and vegetable oils; production and trade. XXXIV, 511pp. Rome, International Institute of Agriculture, Bureau of statistics, 1923. 307 In80
"...The tables of trade have been prepared by Mario Costa."
In this volume the information in the French edition of 1921 is supplemented and brought up to date.
"The volume is divided into two parts. The first (pages 1 to 402) is drawn upon the basis of countries. The cultivation of oil yielding plants and the trade in their products is examined for each country...and the modifications occurring during development of the uses of various articles have been dealt with so far as statistical data exist.
"...The second part (pages 403-506) comprises recapitulatory

tables of area and yield of the chief oil yielding crops, and the trade data of their products and of vegetable oils."

General Survey of the Principal Crops: Soya Beans, pp. XX-XXI.

Production and utilization of the soya in the United States are given, pp. 140-141; production of soy oil, 1914-1918, p. 144; imports of soy oil, 1911-1922, p. 146; exports 1919-1922, p. 147; re-exports 1911-1922, p. 147.

Trade in soybeans for Europe and Asia, pp. 442-443; trade in soybean oil, for Europe, Asia, Africa and the United States, pp. 480-481.

449. Chemical and material markets in 1923: Soya bean oil. Chem. and Metall. Engin. 30(3): 113. Jan. 21, 1924. 381 E12

Gives figures on imports of crude soybean oil in pounds, by months with comparison with 1922, and tank-car prices paid for crude soybean oil, per pound, by months in 1923.

450. Faure, Blattman & Co. Review of the oil and fat markets, 1923-1936. 14v. [London, Eng., 1924-37.] 307 F27

Statistics are presented for monthly prices of soybeans (in the United Kingdom), imports and exports of oil and beans for the chief countries, including the United States.

Earlier reports 1918 to 1922, containing similar material, may be found in Thornett & Fehr. Review of the Oil and Fat Markets, 1918/19, 1920/21, and 1922. 3v. [London, Eng., 1920-23.] 307 T39

451. Gray, George Douglas. The soya bean in international trade. Foreign Affairs 13(2): 340-342. January 1935. 280.8 F76

Statistics are given of soybean production in the chief producing countries, the Manchurian soybean trade, 1907-1932, Manchurian exports, 1927-1932, and imports of soybeans and oil into the chief importing countries, 1930 and 1932. The effect of increased production in the United States upon the Manchurian trade is brought out.

452. International yearbook of agricultural statistics, 1910-1937/38. 29v. Rome, Printing office of the International institute of agriculture, 1912-1938. 251 In84

At head of title of the 1910 issue: Institut international d'agriculture. Bureau de la statistique générale. - 1911/12-1920/21, 1923-1925/26, Institut international d'agriculture. Service de la statistique générale. - 1922. International institute of agriculture. Bureau of general statistics. - 1926/27-International institute of agriculture.

For the following statistics on soybeans, see indexes of the volumes indicated: international trade in soybeans and soybean oil, 1925/26-1937/38, (generally for the four latest years, with

comparisons); imports and exports of soybeans and soybean oil, 1925/26-1926/27, 1928/29 (1928/29 gives sum totals of net exports over imports, including soybeans and oil, and excess of imports over exports, including soybeans); area, production and yield per hectare of soybeans in the chief producing countries, 1932/33-1937/38.

453. Kirjassoff, Max D. Vegetable-oil-bearing materials of Manchuria. U. S. Dept. Com., Bur. Foreign and Dom. Com. Com. Repts. 161, pp. 180-185. July 10, 1920. 157.7 C76D
Includes tables (p. 184) showing the exports of bean-cake and bean-oil to the United States in tons, October 1918 to September 1919, and mentions (p. 185) the increasing demand for the oil in the United States.
454. League of nations. International statistical year-book 1926-1936/37. llv. Geneva, 1927-37. (Publications. II. Economic and financial. 1927. II. 42, 69; 1929. II. 16; 1930. II. 10; 1931. II. A. 16; 1932. II. A. 11; 1933. II. A. 7; 1934. II. A. 6; 1935. II. A. 3; 1936. II. A. 8; 1937. II. A. 7.) 280.9 L47P
Text in French and English.
1930/31 has title: Statistical Year-book of the League of Nations. Issued by Economic Intelligence Service.
1934/35-1936/37 have title: Statistical Year-book.
Exports of soybeans from main producing countries are given in the volumes 1926-1930/31; Cultivated area, production and yield in the various producing countries are included in the volumes 1931/32 on (Yield omitted in volumes 1935-1937). Consult index under soya beans.
455. Noll, Charles F., and Lewis, R. D. Soy beans. Pa. Agr. Expt. Sta. Bull. 167, 20pp. State College, Centre County, Pa., 1921.
"The objects of this bulletin are to call the attention of Pennsylvania farmers to the possibilities of soy beans as a farm crop, to give the results of investigations with soy beans conducted at the Pennsylvania Experiment Station, and to give the essential points in the culture of the crop."
Tables include those showing the average yields per acre of seed of varieties of soybeans, 60 pounds per bushel, average yields per acre of field cured hay of varieties of soybeans, comparison of yields of crops in the oats rotation and in the soybean rotation, feeding values of oats and of soybeans grown on alternate plots 1913-1920, a comparison of the farm values of oat grain and soybean seed, and digestible nutrients in average crops of soybean seed and straw and in soybean hay in the rotation experiment.
456. Over half million acres in soys last year. Orange Judd Farmer 71(5): 133. Mar. 1, 1923. 6 Orl
"Through inquiry from every farm advisor in the state, and

from other information in each Illinois county, the agronomy department at the University of Illinois recently completed a state-wide survey to determine definitely the soybean acreage." The figures are given and explained.

457. Pope, Felix T. World trade in soy beans. Northwest. Miller 157(1): 54. Jan. 2, 1929. 298.8 N81
Production, consumption, import and export statistics for the United States are given.
458. Soya bean oil. Chem. and Metall. Eng. 30(3): 113. Jan. 21, 1924. 331 E12
This is a brief statistical summary of the industry for 1922 and 1923, including imports to the United States, tank car price in 1923 of crude soybean oil and importation of the oil in pounds, 1922-1923.
459. Soybean acreage in U. S. 100 times that of 1907. Oil, Paint and Drug Reporter 128(11): 24. Sept. 9, 1935. 306.8 O15
Figures are given on acreage, consumption, and amount of oil used for paint and varnish, compounds and vegetable shortenings, other edible products, soap, linoleum and oilcloth, printing inks and miscellaneous products.
This same article in abridged form appears in Indus. and Engin. Chem. (News edition) 13(18): 377. Sept. 20, 1935. 381 J825
460. Soybeans for oil and meal, 1932. Flour & Feed 32(10): 24. March 1932. 298.8 F66
Figures are given for the commercial production of soybeans, the quantity crushed, and imports of soybean oil, cake and meal for 1931.
461. U. S. Department of agriculture. Agricultural statistics, 1936-37. 2v. Washington, Govt. print. off., 1936-37. 1 Ag84Yas
Statistical material formerly published in the yearbooks of the Department of Agriculture is printed separately from 1936 on.
The following statistics relating to soybeans are included in the statistical yearbooks for 1936-37: acreage, yield and production of soybeans; prices of crude soybean oil; international trade in beans and oil; imports of soybean oil; farm prices for soybeans; production of bean oil; market prices for the beans; wholesale seed prices; soybean cake and meal imports (1937 only); soybeans crushed; world production of soybeans.
462. U. S. Department of agriculture. Crops and markets, v. 1, Jan. 5, 1924-Dec. 31, 1926. 6v. Washington, [Govt. print. off.] 1924-27. 1 Ag84Wc
This publication continues the weekly "Weather, crops, and markets."

...Monthly supplement, v. 1, suppl. no. 1-v. 3, January 1924-December 1926. 1 Ag84Wcm (See under U. S. Dept. of agriculture. Crops and markets. Monthly supplement.)

Monthly, v. 4, January 1927-v. 15, no. 5, May 1938. 1 Ag84Wcm Contains the data previously appearing in the weekly edition and the Monthly supplement, and continues volume numbering of the Monthly supplement.

Tables showing the following soybean statistics appear in this publication: acreage, yield, production, prices received by producers December 1 (various other dates in 1937 volume), and total value (appears in the December issues); monthly farm prices (U. S. average) 1913 to date given in December issues 1930 and later. (Similar tables for a shorter period of time appear in earlier issues); prices received by farmers, monthly U. S. averages (each issue 1933 and later); wholesale prices of field seeds, including soybean seed (vols. 1, 3, 5, weekly. See index); soybean prices and movement by states (vols. 1-3, 5-6, weekly. See index.); estimated crop conditions appear in July, August, September and October issues of 1931, July, August and September of 1933 and 1934, and August, September and October of 1935-1937; intentions to plant, March issues, 1933, 1935-1938; soybeans produced for grain, 1934 and later (See index); soybeans grown alone for all purposes, July issues 1935 and 1937; prices of feedstuffs, (including soybean meal) at important markets, monthly, 1937 and 1938; soybeans for beans, production in leading states, October 1937 issue; acreage of crops harvested, including soybeans, 1919-37 in December 1937 issue.

The December 1937 issue also contains soybeans for hay: acreage harvested, 1928-32, 1936, 1937; yield 1924-32, 1936, 1937; production 1928-32, 1936, 1937; soybeans grazed or plowed under 1928-32, 1936, 1937; soybeans for beans: Acreage harvested 1928-32, 1936, 1937; yield per acre 1924-32, 1936, 1937; production 1928-32, 1936, 1937; and cash income, 1936-1937; soybean acreage for all purposes, 1928-32, 1936-1937. Information in this last paragraph is all given by states.

463. U. S. Department of agriculture. Crops and markets. Monthly supplement, v. 1, no. 1-v. 3, no. 12. Washington, D. C., January 1924-December 1926. 1 Ag84Wcm

The following statistics for soybeans are included in each volume: Acreage, yield and production of soybeans by states (November 1924, and December 1925 and 1926); monthly farm prices, U. S. averages (December issues); retail soybean seed prices, by states (March issues); soybean shipments, stocks and prices, by states (compiled from shippers' reports) (March issues 1924 and 1925, April for 1926); soybean condition reports (July, August, September and October, 1925, and August, September and October, 1926).

464. U. S. Department of agriculture. Weather, crops and markets, v. 1, no. 1, Jan. 7, 1922-v. 4, no. 26, Dec. 29, 1923. Washington, D. C. [Govt. print. off.] 1922-23. 1 Ag84We

Combination of Market Reporter, the National Weather and Crop Bulletin, and the Monthly Crop Reporter.

Continued by Crops and Markets.

The following soybean statistics are included: v. 1, outlook and condition; farm value; wholesale prices of soybean seeds; v. 2, prices and movement; acreage, yield and prices; v. 3, prices, shipments and stocks, by states; wholesale seed prices at principle markets, weekly; v. 4, acreage, yield and prices, by states; prices and movement, by states; prices on farm, by months, 1913-23, U. S. averages; prices on farm in November, by states, 1922 and 1923.

Brief articles discussing the soybean situation are to be found through the indexes to these volumes.

465. U. S. Department of agriculture. Yearbook of the United States Department of agriculture, 1917-1935. 18v. Washington, D. C., 1918-1935. 1 Ag84Y

The following statistics relating to soybeans are given in the yearbooks of agriculture, 1917-1935: Soybean oil imported into the United States.

Farm prices for soybeans (yearbooks 1918-1921, 1923-1925); Acreage, production and value (yearbooks 1919-1921, 1923-1924, 1928, 1930-1935); Soybean oil exports (yearbooks for 1920-1925, 1928, 1930-1934); Soybean seed used per acre (yearbooks for 1922-1923); Soybean seed, average wholesale selling price (yearbooks 1925-1935); Soybean oil crude, selling price per pound (yearbooks 1928-1935); International trade in soybeans and oil (yearbooks 1928-1935); Production of soybean oil (yearbooks 1930-1935).

The titles of tables giving the same type of information vary from year to year, and there are also differences in the time range for statistical tables giving the same type of information.

466. U. S. Department of agriculture, Bureau of agricultural economics. Flax, soybeans, peanuts and cottonseed outlook charts. 3 nos. Washington, D. C., 1935-37. 1.9 Ec70f1

1936 outlook (Washington, D. C., Nov. 1935) contains charts showing Soybeans: acreage, 1929; Soybeans: tonnage gathered and crushed and percentage gathered crushed; Meals, cottonseed, linseed, and soybean: prices per ton at selected markets; Vegetable oils: prices f.o.b. crude, Aug. 1929 to date [includes soybean oil].

1937 outlook (Washington, D. C. November 1936) includes charts showing Soybeans: tonnage gathered and crushed and percentage gathered crushed 1925-26 to date; Vegetable oils: prices f.o.b. crude, Aug. 1929 to date [including soybeans]; Meals, cottonseed, linseed, and soybean: prices per ton at selected markets. Supplement, p. 19, has map showing soybean production in the United States in 1929.

Oil seeds, 1938. Flax, soybeans, peanuts, and cottonseed. 18pp. (Washington, D. C., October 1937) Has charts showing consumption of oils by the drying industries in the United States, 1931 to date [including soybean oil]; Soybeans: Production, utilization, and average farm price, 1924 to date; Factory consumption of soybean oil by groups of industries, United States, 1931 to date; Prices of soybean, cottonseed, and linseed oils in specified localities, 1929 to date; Prices of soybean, cottonseed, and linseed meals at specified markets, 1925 to date.

467. U. S. Department of agriculture, Bureau of agricultural economics. Rice, peanuts, soybeans, dry beans, and broomcorn outlook charts, for use with the Agricultural outlook for 1935. 21pp., processed. Washington, D. C., November 1934. 1.9 Ec70rp
Map, p. 11, shows soybean acreage for 1929, and a graph, p. 12, shows prices for crude vegetable oils, including imported soybean oil, Oct. 1922 to date.
468. U. S. Department of agriculture, Bureau of agricultural economics. Rice, peanuts, soybeans, dry beans, and broomcorn outlook charts, with explanations, 1933-34. 24pp., processed. Washington, D. C., October 1933. 1.9 Ec70rp
Map, p. 13, shows soybean acreage, 1929; and a graph, p. 14, shows prices for crude vegetable oils, including imported soybean oil, Oct. 1922 to date.
469. U. S. Department of agriculture, Bureau of agricultural economics. Soybean, cowpea, and velvet bean shipments, stocks, and prices. 2pp., processed. [Washington, D. C., March 16, 1938.] 1.9 Ec712Sc
Includes a table showing Comparative Stocks, Shipments, and Prices, Compiled from seed shippers' reports, for soybeans, cowpeas and velvet beans, by state or district.
470. U. S. Department of agriculture, Bureau of agricultural economics, Hay, feed and seed division. Soybeans crushed, oil and meal produced, imports and exports soybeans and soybean products, and stocks of soybeans and soybean oil (compiled from Department of commerce statistics of fats and oils, except as noted). 1p., processed. [Washington, D. C., April 27, 1937.] (HFS-1863) 1.9 Ec712Soy
April 27, 1937 gives figures in tons, 1928-1935, by years, beginning October 1st, and stocks of soybean oil and soybeans, by years beginning Sept. 30, 1929-1936.
471. U. S. Department of agriculture, Bureau of agricultural economics, Hay, feed and seed division. Soybeans crushed, oil and meal produced, imports and exports soybean products, and stocks of soybeans and soybean oil. (compiled from Department of commerce

statistics of fats and oils). 1p., processed. [Washington, D. C., 1935?] 1.9 Ec712Soy

Gives figures in tons, 1926 to 1934, by years, for year ending September 30, and stocks of soybean oil and soybeans, by years beginning Sept. 30, 1926 to 1934.

472. U. S. Department of agriculture, Bureau of crop estimates. Cowpea, soy bean, and velvet bean production, 1918 and 1917 as estimated by state field agents... 1p. [Washington, D. C., U. S. Dept. of agriculture, Bureau of crop estimates, May 25, 1919] 1.9 St2Cp

Lists soybeans produced for grain by states, giving acres, yield per acre in bushels and total production in bushels, for 1917 and 1918.

473. U. S. Department of agriculture, Bureau of markets. Seed reporter, v. 1, no. 1-v. 3, no. 4. Washington, D. C., November 1917-Oct. 11, 1919. 1 M348

Discontinued after Oct. 11, 1919.

Seed reports continued in the U. S. Dept. of Agriculture, Bureau of Markets, Market Reporter.

The following data on soybeans are included:

Soy bean situation in eastern North Carolina, 1(1): 4. November 1917; Soy beans in Mississippi and Louisiana 1(2): 8. Dec. 1, 1917; Tabulation of reports from shippers of cowpeas, soy beans, and lespedeza 1(4): 2. Feb. 1, 1918; Movement and supplies of soy beans and cowpeas 1(7): 1. April 6, 1918; Tabulation of reports from shippers of sorghums, millets, sudan grass, soy beans, cowpeas, and lespedeza. 1(7): 3. April 6, 1918; Movement of forage crop seeds from first hands: soy beans. 2(1): 7. July 6, 1918; Report of commercial field seed stocks, sales and seed requirements for the United States; seed survey of July 1, 1918. Soy beans. 2(4): 3. Oct. 5, 1918; Soy bean, cowpea, and velvet bean seed outlook. 2(7): 3-4. Jan. 11, 1919; Notice of special Soy bean, cowpea, and velvet bean inquiry. 2(7): 4. Jan. 11, 1919; Seed market notes: soy beans, cowpeas, and millets 2(7): 4. Jan. 11, 1919. (Gives prices); Stocks, shipments, prices, etc., of soy beans and cowpeas 2(8): 6. Feb. 8, 1919; Final soy bean, cowpea, and velvet bean, and millet and sorghum seed shippers' report. 2(9): 6. March 8, 1919; Movement and supplies of soy beans, cowpeas and velvet beans 2(10): 6. April 5, 1919; Soy bean and cowpea variety information 2(10): 7. April 5, 1919. (Average percentage of total quantity normally handled by wholesale and retail seedsmen, and average percentage of total quantity normally shipped out from producing centers by local shippers.); Soy beans: counties reported as normally producing either a surplus quantity or an insufficient quantity of seed as compared with planting requirements. 2(12): 6. June 7, 1919. (A map); and Estimated total seed requirements and the estimated percentage and quantity that are obtained from each of the three general sources of supply: soy beans. 3(4): 11. Oct. 11, 1919.

474. U. S. Department of agriculture, Bureau of markets and crop estimates. The market reporter, v. 1-4, Jan. 3, 1920-Dec. 31, 1921. 4v. [Washington, Govt. print. off.] 1920-21. 1 M34M

v. 1-3, 1920-June, 1921, issued by Bureau of markets.

"The Market reporter is an outgrowth of earlier publications in more limited fields issued by the Bureau of markets. The periodicals formerly issued under the titles of 'Seed reporter' and 'Food surveys' have been merged into this more comprehensive publication..." - v. 1, no. 1, p. 1.

In January, 1922, combined with Monthly Crop Reporter and the National Weather and Crop Bulletin to form Weather, Crops and Markets.

The following soybean statistics are included:

Acreage, yield and prices of soybeans, v. 2, no. 20, p. 317, Nov. 13, 1920; and v. 4, no. 22, p. 351. Nov. 26, 1921; Stocks, shipments and prices of soybeans, cowpeas and velvet beans for seed (by states, based on seed shippers' reports), v. 1, no. 7, p. 103. Feb. 14, 1920; Retail seed prices (including soybeans) monthly, v. 1, March 6-June 5, 1920, and v. 3, March 12-June 4, 1921; Wholesale prices of field seeds (including soybeans) weekly, v. 1, Jan. 3-June 5, 1920, and v. 3, Jan. 8-June 4, 1921; Stocks of vegetable oils (including soybean oil) at end of quarter year periods (1919 and 1920), yearly production and consumption (1912-18), and imports of oils and lards (1912-20), in v. 2, no. 23, p. 366. Dec. 4, 1920.

For brief articles and notices on soybeans, consult index under Beans, soy.

475. U. S. Department of commerce, Bureau of the census. United States census of agriculture: 1935, v. 1-3. Washington, U. S. Govt. print. off., 1936. 157.41 C3322

V. 2. Reports for States with Statistics for Counties and a Summary for the United States, second series, includes, table XII, p. XXIII, statistics on soybeans harvested for beans or hay, or grazed, acreage grown alone, acreage grown with other crops, acreage and bushels harvested for beans, and value in dollars for the United States, 1909, 1919, 1929, and 1934. Table XV, pp. XXXIV-XXXV, summarizes soybean statistics of soybeans grown alone, grown with other crops and harvested for beans, by divisions and states, 1934 and 1929, and the same statistics are given by counties for each state (Title: Miscellaneous crops - annual legumes...Jan. 1, 1935); also gives for each state: acreage, quantity and value of miscellaneous crops harvested, 1909 to 1934 (including soybean total acreage, acres grown alone and with other crops, quantity harvested for beans, and value of beans harvested, 1934, 1929, 1924, 1919, and 1909).

V. 3. General Report. Statistics by Subjects, has a table, no. 26, pp. 340-341: Soybeans harvested for beans or hay, or grazed -

farms reporting and acreage, with quantity and value of beans harvested, by divisions and states: 1934 and 1929. Soybean figures are also included in table 1, p. 295: Farms reporting, acreage harvested, production, and value of crops in the United States: 1934 and 1929; and in table 2, p. 299, Specified crops - summary for the United States: 1839 to 1934 [soybeans harvested for beans, in 1909, 1919, 1929, and 1934.]; and in table 66, p. 396, Rank of divisions and states in the acreage, production, and value of specified crops, 1934 and 1929...[soybeans harvested for all purposes and beans harvested.]

For earlier figures see The Fifteenth Census of the United States: 1930. Agriculture, Volume IV, General Report, Statistics by Subjects. Washington, U. S. Govt. print. off., 1932. 157.4 C153. Includes, Ch. XI, statistics on individual crops. Table 41, p. 770, gives statistics of soybeans, acreage grown alone and with other crops, bushels and value harvested, 1929, by divisions and states; and a map, p. 769, shows soybean acreage grown alone and with other crops in 1929. V. II, 3 pts, gives reports by states, with statistics for counties and a summary for the United States. Table 41, pt. 1, p. 84, shows farms reporting soybeans, acreage grown alone and with other crops, and quantity harvested for geographic divisions and states; county tables VII include for counties in each state, farms reporting soybeans, acreage grown, alone and with other crops, and bushels for 1929.

The United States Census of Agriculture, 1925, 3pts. Washington, U. S. Govt. print. off., 1927. 157.41 C332

Pt. 1. has Summary for the United States, pp. 1-77. State table VI, pp. 60-67, includes number of farms reporting soybeans for the United States and divisions, 1924. County tables are given for each state for the same information.

The Fourteenth Census of the United States taken in the year 1920. Volume V. Agriculture. General Report and Analytical Tables. Washington, Govt. print. off., 1922. 157.4 C14. Table 58, p. 777, includes figures on soybeans, farms reporting, acreage, production in bushels, and value, 1919 and 1909, by states. Ch. XI. Summary for all crops, has a table, no. 1, p. 700, which shows acreage, production, and value of all crops in the United States: 1919 and 1909, including soybeans. Table 9, States leading in the production of each crop: 1919, includes soybeans.

The Thirteenth Census of the United States taken in the year 1910. Volume V. Agriculture, 1909 and 1910. General report and analysis. Washington, Govt. print. off., 1914. 157.4 C13 Ch. IX. Individual crops, has a table, no. 53, p. 626, for dry beans other than edible, which includes figures on acreage, production in bushels, and value of soybeans, in 1909, for six states.

476. U. S. Tariff commission. Certain vegetable oils. 174pp. Washington, Govt. print. off., 1926. 173 T17Ce

Part 1. Costs of production, contains a statement, Section 4, pp. 55-74, on soybean oil. It gives the rates of duty, and describes the uses for the oil, its sources, foreign and domestic production, domestic production and consumption, imports, principal competing country (Manchuria), exports of domestic and foreign oil, foreign production and consumption, costs of production in the United States, China, Japan, and Great Britain, and a comparison of these cost data. Section 5, Interest on Capital Invested in Crushing Vegetable Oils, has a passage on soybean oil, p. 77, which gives that information for 1924.

Part 2. Economic Study of the Trade in and Prices and Interchangeability of Oils and Fats, includes references to the domestic production of soybean oil, pp. 94-95; net imports of oils, including soybean oil, into the United States 1910-1924, pp. 97-98; general imports of the principal free vegetable oils, 1912, 1914, and 1916-1924, p. 101; international supply and consumption of soybeans and soybean oil, pp. 115-117; price changes of soybean oil and beans, p. 139; statistics of these price changes, pp. 142, 143, 152, 153, 154, 155. The Interchangeability of Oils and Fats in Consuming Industries, pp. 156-174, has scattered references to soybean oil, and a special section on soybean oil, pp. 172-174, giving data received from questionnaires on the interchangeability of oils and fats.

477. U. S. Tariff commission. Survey of the American soya-bean oil industry. Prepared by the United States Tariff commission and printed for the use of Committee on ways and means, House of representatives. 22pp. Washington, Govt. print. off., 1920. 173 T17Ss

The study gives a description of the oil, its uses, methods of production, domestic production and consumption, domestic exports, foreign production and international trade, imports, prices, competitive conditions, and tariff history.

Tables include domestic production, imports for consumption, domestic exports and value of imports for consumption for the calendar years 1910-1920; soybean oil production in the United States in pounds, 1914, 1916-1919; quantity and value of soybean oil imports by countries 1912-1920; revenue on soybean oil and cake imports for consumption; quantity and value of domestic exports of soybean oil for 6 months ending Dec. 31, 1919; prices of wholesale soybean oil at Dairen, Manchuria; prices of Manchurian soybean oil in New York, 1913-1919; prices of soybean cake in Dairen, 1918-1919; rates of duty on soybean oil, 1883-1913; consumption of fats and oils, (including soybean oil) by the lard-substitute industry, 1912, 1914, 1916-1918; consumption of fats and oils by the soap industry (including soybean oil), 1912, 1914, 1916, 1917; consumption of fats and oils by the oleo-margarine industry (including soybean oil), 1912, 1914, 1916-1918.

This same title is included, pp. 197-212, in U. S. Tariff commission. Tariff information surveys on the articles in paragraphs

44 and 45 of the Tariff act of 1913, and related articles in other paragraphs. 212pp., rev. ed. Washington, Govt. print. off., 1921. (A-11) 173 T17Ta A-11 1913.

478. Wright, Philip G. The tariff on animal and vegetable oils. 347pp. New York, The Macmillan co., 1928. (Institute of Economics. Investigations in International Commercial Policies) 285 W93T
"With the Aid of the Council and Staff of the Institute of Economics."

Soya Bean Oil, pp. 50-52, brings out the properties and uses of the oil, methods of production, and amount of production, imports, and exports for the years 1914-1926. Conclusions as to the tariff policy on the oil are made, pp. 232-236; figures as to the rise in prices from June, 1921, to December, 1923, and to December, 1925, p. 132.

The appendix contains numerous statistical tables which include information on soybean oil: I. Domestic production of the principal oils and fats, 1914 and 1919-1926; II. Imports of the principal animal and vegetable oils and fats for the years specified [1914-1926]; III. Exports of the principal animal and vegetable oils and fats, 1914 and 1919-1926; IV. Domestic consumption of the principal animal and vegetable oils and fats, 1914 and 1919-1926; V. Data indicating the extent to which the United States is self-sufficient in the production of the fatty oils; VI. Domestic production and foreign trade of the United States in raw materials of the vegetable oils, 1914 and 1919-1926; VII. Revenues derived from imports of the principal animal and vegetable oils and fats, 1914 and 1919-1926; IX. Prices of the principal oils and fats, by months, January, 1920, to September, 1927, inclusive.

STORAGE

479. Bredemann, G., and Kummer, H. Ueber den einfluss der lagerung der sojabohnen auf die extrahierbarkeit und die extraktionsgeschwindigkeit des oeles und der phosphatide. Fettchemische Umschau 41(5): 81-85. May 1934. 384 C422

Influence of storage of soybeans on the yield and speed of extraction of oil and phosphatides.

480. Fire in soybean meal bin. Grain & Feed Jours. Consolidated 78(6): 259. Mar. 24, 1937. 298.8 G762

A description of the fire in the soybean oil mill of Spencer Kellogg & Son at Des Moines, Ia., and the conditions causing it.

481. Halliday, George E. Changes in the phosphatide content of crude soybean oil during storage. Oil & Soap 14(4): 103-104. April 1937. 307.8 J82

"A paper presented at the Fall meeting of the American Oil Chemists' Society, at Chicago, October 8-9, 1936."

Bibliography, p. 104.

"These data are from a thesis submitted by G. E. Halliday to the Faculty of the Graduate School of Purdue University in partial fulfillment of the requirements for the degree of Master of Science, August, 1934."

Results of sampling at three levels, for phosphorus content, fifteen carloads of crude soybean oil which had been stored from three to 112 days.

482. Jones, D. Breese, and Gersdorff, Charles E. F. Changes that occur in the proteins of soybean meal as a result of storage. Amer. Chem. Soc. Jour. 60(3): 723-724. March 1938. 381 Am33J

"The chemical studies outlined above are being supplemented by feeding experiments to determine the effects of storage on the biological value of the proteins. Storage studies on the samples will be continued for two years or more. Final results and details of the work will be published later. Similar studies on the proteins of other seeds of importance as foodstuffs will be made both on the meals and on the whole grains."

These studies are being carried out by the Protein and Nutrition Research Division, Bureau of Chemistry and Soils, U. S. Department of Agriculture.

483. McClain, R. E. Soybean hazard. Hot meal cakes transferred to storage tanks cause fire. Weekly Underwriter 137(6): 255-256. August 7, 1937. Libr. Cong. HG8011.W4

Describes the fire which occurred in the steel tank filled with soybean meal cake at the oil extraction plant of Spencer Kellogg and Sons, Inc., Des Moines, Iowa, and the best method of preventing and controlling such fires in the future.

484. A Manchurian railroad sets a wise example for American railroads. Manfrs. Rec. 88(22): 56-57. Nov. 26, 1925. 297.8 M31

This article is based on one by Taro Ito entitled "The Soya Bean in Manchuria" in the Far Eastern Review. It describes the "mixed storage system" of the South Manchuria Railway Co., which has resulted in improvement of quality and facilitated the sale of beans.

485. Moscow. Nauchno-issledovatel'skii institut soi i spetsial'nykh kul'tur. ...Sushka i khranenie semian soi. Sbornik statei. 157pp. [Moskva] 1932. 60.3 M35

At head of title: - Vsesoiuznyi nauchno-issledovatel'skii institut soi. M. S. Duhin, V. N. Galich...

This is a series of studies on drying and storing soybean seeds written in Russian with English summaries.

Results of practical work and actual problems of drying and storing soybean-seeds, by M. S. Dounine and N. S. Thormann, pp. 171-58 (Summary in English, pp. 57-58).

Heat and moisture régime for the storage of soybean seeds, by M. S. Dounine and E. A. Tolskaya, pp. [59]-[103]. Summary, pp. [100]-102.

Chemical (granular) method of drying soybean seeds, by M. S. Dounine, pp. [105]-[137]. Summary, pp. 135-[137].

Claytonisation of soybean seeds, by M. S. Dounine, A. M. Synski, and F. M. Sheniakin, pp. [139]-[151]. Summary, pp. 150-[151]. This gives results of treating soybean seeds with SO₂ to stop fungus and bacterial infection.

486. Oathout, C. H. Vitality of soybean seed as affected by storage conditions and mechanical injury. Amer. Soc. Agron. Jour. 20(8): 837-855. August 1928. 4 Am34P
"Literature cited", pp. 854-855.
"Contribution from Dept. of Agronomy, University of Illinois, Urbana, Ill..." - Note.
"The experiments presented in this paper fall under two headings, viz., storage conditions affecting the longevity of soybean seed and the effect of threshing injury upon the longevity and vigor of soybean seed."
487. A soybean elevator. Grain & Feed Jours. Consolidated 77(12): 511-512. Dec. 23, 1936. 298.8 G762
A description of the soybean elevator completed for Spencer Kellogg & Sons, Inc., Chicago, Ill.
488. The soybean in American feed milling. Amer. Miller 57(2): 1197. Dec. 1, 1929. 298.8 Am32
This article describes the plant at Peoria, Ill., of the American Milling Co. (Allied Mills), which is constructing a new elevator in which to store soybeans, one of their principal commodities.
489. Storing soybeans for seed. Grain & Feed Jours. Consolidated 75(8): 336. Oct. 23, 1935. 298.8 G762
"In January and February, 1933, soybean seed from the 1932 crop of five varieties commonly grown in Illinois, and eight varieties commonly grown in North Carolina, were placed in storage by the Division of Seed Investigations at Urbana, Illinois; Montgomery, Ala.; Washington, D. C., and in the tidewater region of North Carolina...
"Present indications are that in addition to the moisture content and temperature, other factors, such as the oil content, contribute toward the ability of soybean seed to retain its viability."
490. Wand, Frederick A. Safe storing of soybeans. Grain & Feed Jours. Consolidated 74(7): 283. Apr. 10, 1935. 298.8 G762
Abstract of address "before Society of Grain Elevator Superintendents."
Soybean market grades, and rules to be followed in storing the beans, are considered.

UTILIZATION

General

491. Adkins, Dorothy Margaret. The soya-bean problem. Science Prog. [London] 15(59): 445-451. January 1921. 472 Sci22
The author sets forth the uses for the bean, the oil, cake and meal, and the food value of the bean. Its importance in the United States is briefly mentioned.
492. An agricultural crop of tremendous possibilities for industry. Manfrs. Rec. 105(4): 30. April 1936. 297.8 M31
"Production of soy beans rapidly increasing because of their industrial and food value. May be processed by South's cottonseed and peanut crushing plants." The work of the industrial research laboratory at Urbana, Illinois, is mentioned.
493. [American chemical society.] The utilization of soya beans. A series of papers read before the American chemical society. Chem. Age [London] 34(880): 417-418. May 9, 1936. 382 C427
Abstracts of seven papers on soybeans read before a "recent" meeting of the Division of Agricultural and Food Chemistry of the American Chemical Society, at Kansas City. The papers were 1) [Chemical studies of the beans and their utilization] by N. F. Tree; 2) [Soybean oil in the paint industry] by E. E. Ware; 3) [Extraction methods] by N. T. Spoerri; 4) [Uses of soy oil] by M. M. Durkee; 5) [Food uses for varieties of beans] by Sybil Woodruff and Helen Klaas; 6) [Improvement of nutritive properties of soybeans brought about by heating] by C. L. Shrewsbury and E. B. Johnson; 7) [Soybean oil for soap making] by A. A. Horvath.
494. American farm bureau federation. Interchangeability of oils and fats. Report. 71st Congress, 2d sess., Senate doc. 82, 115pp. Washington, U. S. Govt. print. off., 1930. Pam. Coll. (Fats and Oils)
Quotations are assembled, pp. 41-43, on the uses of soybean oil as food, in soap making, for paints and varnishes, and in rubber substitutes, and its possible substitution or interchangeability for edible purposes, for soap making, and for paints, varnishes and oilcloth. The section on soybean oil in the condensed summary of oils and fats mentioned in the tariff bill (H.R. 2667) is given on p. 102.
495. Anderson, Russell H. The industrial uses of the soybean. 10pp., processed. Chicago, Museum of science and industry, 1936. Pam. Coll.
This talk was a broadcast over the Affiliated Broadcasting Co., May 9, 1936.
The utilization of soybean oil in the paint industry and of the meal in plastics, and food products produced from the soybean are

described. It is said that "few if any strictly new products utilizing the soybean have been developed", since the use of the bean usually means the displacement of some other product.

496. Barr, J. E. Soybean industry is rapidly developing in United States. U. S. Dept. Agr. Yearbook, 1930: 487-488. Washington, D. C., 1930. 1 Ag84Y
The industrial value of soybean oil and meal, soybeans for human food, and the need for crushers of a constant supply of beans, are pointed out.
497. Barr, J. E. Soybeans: the basis of a new industry. 2pp., processed. Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, Hay, feed and seed division, 1929. 1.9 Ec7Ra
"Radio talk...delivered through Station WRC and 16 other stations associated with the National Broadcasting Company, June 7, 1929."
Uses for soybean oil and soybean meal, and the financial aspects of soybeans for the farmer are described.
498. Beltzer, Francis J. G. Etudes sur la caséine végétale du "soja" et ses applications. Revue Scientifique 49, 1^{er} sem. (23): 716-720. June 10, 1911. 473 R32
This is a study of the vegetable casein obtained from the soybean and its applications. The preparation of vegetable milk and cheese, and the preparation and extraction of the casein in industry and the uses to which it may be put, are described.
Extended utilization of soya bean products. Sci. Amer. Suppl. 72(1859): 115. Aug. 19, 1911. 470 Sci25. This is an article on the food and industrial uses of the soybean, based on the article by F. J. G. Beltzer in the Revue Scientifique.
499. Beltzer, Francis, J. G. Industries du lactose et de la caséine végétale du "soja". 144pp. Paris, B. Tignol [1912] (Bibliothèque des actualités industrielles, no. 144) 309 B41
Part II. Le Lait Végétal, La Caséine Végétale, et les produits industriels retirés des graines de "soja", pp. 101-141. The following matters are taken up: vegetable milk prepared from soybeans, vegetable cheese, industrial vegetable casein and details of its preparation, the equipment and management of a factory for the treatment of soybeans, and the uses in industry for the casein.
500. Beltzer, Francis J. G. Le lait végétal, la caséine végétale et les produits industriels retirés des graines de "soja". Revue de Chimie Industrielle 22(259): 209-215; (260): 241-251. July, August 1911. 383 R326
The writer describes vegetable milk, casein, and the industrial products derived from the soybean.

501. Bolton, E. Richards. Oils, fats and fatty foods; their practical examination; a handbook for the use of analytical and technical chemists and manufacturers; with a chapter on vitamins, by J. C. Drummond; Being a second edition of "Fatty foods" by E. Richards Bolton and Cecil Revis. 416pp. Philadelphia, P. Blakiston's son & co., 1928. 389 B63 Ed.2
Ch. VIII. Vegetable Oils and Fats, pp. 144-301, contains a section on Soya Oil, pp. 204-207. In it are a brief discussion of the place of soybean oil and meal and beans on the European market, and a description of the oil, its possible adulterants, a proposed standard for valuation of the oil, uses of the oil, and uses of the bean and non-fatty portion.
502. Bordas, Jean. Le soja et son rôle alimentaire. 36pp. Paris, Hermann & cie., 1937. (Actualités Scientifiques et Industrielles 557. Nutrition: Exposés publiés sous la direction de Émile F. Terroine... III.) 60.3 B644
Bibliography, pp. 35-36.
Chapter III, pp. 17-24, gives an analysis of the food value of the soybean and its use as forage.
Chapter IV, pp. 25-29, outlines the agricultural and industrial uses for the bean and its utilization in various food preparations.
503. Borkowski, Rudolf. Die entwicklung der production und des internationalen handels an hülsefrüchten. 133pp. Berlin-Neukölln. 1933. 60.3 B642
Inaug.-diss.-Landw. hochschule, Berlin.
Bibliography, pp. 131-133.
An account of the use of legumes...for human and animal food followed by a discussion of production and export of legumes in the most important countries. - Agr. Econ. Lit. 7(7): 505. September 1933.
Soybeans are included.
504. Bowdidge, Elizabeth. The soya bean; its history, cultivation (in England) and uses; foreword by Sir John T. Davies. 83pp. London, Humphrey Milford, Oxford Univ. press, 1935. 60.3 B67
The place of the soybean in the United States, pp. 10-11; feeding value and cutting of soybean hay, pp. 53-56; value of soybean straw, pp. 56, 58; soybeans in soil improvement, pp. 61-63; uses for soybean oil, cake and meal, pp. 64-78; soybeans as human food, pp. 79-83.
505. Breedlove, L. B. Food and industrial prospects for soybeans. Grain & Feed Jours. Consolidated 77(8): 363. Oct. 28, 1936. 298.8 G762
"Excerpts from the address...before the Soybean Conference at the Grain & Feed Dealers National Ass'n convention."
Food and industrial uses of the beans are described.

506. Burlison, W. L. The soybean. A plant immigrant makes good. Indus. and Engin. Chem. 28(7): 772-777. July 1936. 381 J825

"Literature cited", p. 777.

"The soybean, established for many centuries in the Orient, is now rapidly coming into prominence as a farm crop in this country. Nearly 40,000,000 bushels of soybeans were grown in the United States in 1935. The soybean grain is by far the richest in protein and oil of any of our common crops. Besides furnishing excellent feed and fodder on the farm, the soybean is finding a wide use in the industries. Various edible products of high nutritive value are becoming available on the market. Besides its use in the paint industry, the oil has a prominent place in the fabrication of a long list of important commercial commodities. The residue from the oil is now receiving much attention as a raw material for the preparation of plastics and paper sizing." - Abstract, p. 773,

Lines of study needing investigation are listed at the close of the article.

Printed "in substantially the same form" as Ill. Agr. Col. Ext. Circ. 461, 15pp, Urbana, 1936.

507. Carminati, Giulio. La soia e la lana artificiale. L'Italia Vinicola ed Agraria 26(4): 50-53. Feb. 10, 1936. 95.8 Itl

The writer discusses the artificial wool produced from soybeans, and other uses to which the beans are put. The possibilities of the crop for Italy are considered.

508. Cruz, Aurelio O., and West, Augustus P. Composition of Philippine soy beans and soy-bean oil. Philippine Jour. Sci. 48(1): 77-88. May 1932. 475 P53

It is shown in the analyses that Philippine soybeans and soy-bean oil are very similar in composition to those produced in other countries. The industrial and food uses and value of the beans are pointed out.

509. Edie, E. S. Cultivation and uses of soya beans. Liverpool Univ. Inst. Com. Research in the Tropics Bull. 1(1): 7, Oct. 8, 1909. 26 L75

Contains a section on uses for the soybean, pp. 1-4.

510. File, Howard. We can make almost anything from soy beans. Farmers' Elevator Guide 31(9): 3-4. Sept. 5, 1936. 280.28 Am3

"An illuminating article published in Staley Journal."

The products of commercial value produced through research by the A. E. Staley Manufacturing Company, are described.

511. Fers, Alberto J. El frijol soya, materia prima para la producción de aceite. Revista de Agricultura 19(8-9): 64-66. August-September 1936. 8 Ag88Re
Briefly describes the importance of the soybean as a raw material for the production of oil. At the end of the article are listed the products (food, feed, and industrial) obtained from the soybean.
512. Fritzsche, Curt. Deutsche sojabohnen. Praktische erfahrungen über anbau und verwertung aus 12 jähriger versuchszeit. 38pp. Frankfurt, Trowitzsch & sohn [1937]. 60.3 F91
The importance of the soybean as food, feed and for oil, pp. 6-9; the advantages of soybean culture for the planter and in the national economy, pp. 32-34; the soybean in national nutrition, pp. 34-35. Recipes are included.
513. Gouin, R. Le soja et son tourteau. Journal d'Agriculture Pratique (n.s.) 56(50): 470-471; (51): 492-494. Dec. 12-19, 1931. 14 J82
Chemical composition of the soybean, products derived from it, the composition of soybean oilcake, and its use in animal feeding are discussed.
514. Hamilton, R. W. Soybeans. Clemson Agr. Col., S. C. Ext. Bull. 76, 16pp. Clemson College, 1926, revised April 1931.
"The varied uses to which soybeans may be put makes this crop adaptable to any farming or cropping system followed in South Carolina. They can be used as a soil improving crop, as a grazing crop, as a hay crop, a supplementary cash crop, or as a combination of these. The impartiality of soybeans to soil type further widens their use to all sections of the state...Soybeans are of more universal utility than any other legume crops grown in South Carolina." - Foreword.
515. Hanger, Wallace E. Uses of soybean seed. Ohio Agr. Col. Ext. Serv. Crop Talk no. 4, [4]pp. Columbus, 1923.
The writer discusses soybeans as a feed, as a source of high-grade oil, soybean oil meal and the outlook for soybean oil mills, and soybeans for seed purposes.
516. Hausman, Margaret J. Soybean oil. Soap 12(12): 27-30, 39, 77. December 1936. 307.8 Sol2
The uses for soybeans, characteristics of the oil and its uses, and the bearing of increasing production of soybean oil on the soapmaker's raw material situation, are described.
517. Hayward, J. W. Utilization of soybeans. Grain & Feed Rev. 26(1): 12, 13, 14-17. September 1936. 280.28 C78 Reprint in Pan. Coll. (Soybeans)
"This paper was prepared...for delivery on Tuesday, June 23, before the Fifty-Seventh Annual Convention of the Ohio Grain, Mill and Feed Dealers Association...Sandusky, Ohio..."

Following a detailed discussion of the chemical composition of the soybean, the paper studies the uses of the bean and its various products such as lecithin, soybean flour, soybean oil, soybean protein, and oil meal; the methods of oil extraction, and the feeding value of the beans; and makes recommendations for the use of soybean oil meal in feeds for poultry and live-stock.

Extract from this paper appeared under title "Using Soybean Oilmeal in Feeds for Poultry and Live Stock." Grain & Feed Jours. Consolidated 77(3): 127. Aug. 12, 1936. 298.8 G762

518. Heinze, B. Einiges über die Sojabohne, ihren anbau, den volkswirtschaftlichen wert und ihre besondere bedeutung als heil- und gewürzpflanze. Heil- und Gewürzpflanzen 2(4): 82-91; (6): 129-134. October, December 1918. 71.8 H36

Bibliography, p. 134.

This is a discussion of the economic value of the soybean, its culture, and special uses as a medicinal and aromatic plant.

519. L'Heureux, L. Le soja. Congo 1(2): 214-236; (3): 365-383. February-March 1933. Libr. Cong. DT641.C6

Bibliographie, p. 383.

The first installment enumerates the various food and industrial uses to which the soybean may be put. The second treats of the methods of preparing soybean milk in various countries and the research that has been done in this line.

520. Hills, J. L. Concerning alfalfa and soy beans. Vt. Agr. Expt. Sta. Bull. 204, pp. 40-72. Burlington, 1917.

The section dealing with soybeans, pp. 63-72, includes material on the uses of the soybean as seed and grain, as a soiling crop, as a hay crop, as pasturage, and as silage and grain when mixed with corn.

521. Holland, E. B. Soy beans and soy bean oil. Mass. Agr. Expt. Sta. Ann. Rept., (1908, pt. 2)21: 111-119. Boston, 1909. (Public Doc. No. 31)

The economic uses of the soybean, and the chemistry of soybean oil and meal are brought out.

522. Horvath, A. A. The soy-bean industry in the United States. Jour. Chem. Ed. 10(1): 5-12. January 1933. 381 J826

Bibliography, p. 12.

The writer describes the increasing soybean production in the United States, the processes used in oil milling, the industrial uses of soybean oil and its uses as food, the uses for lecithin, the uses of the beans for various food products, the soybean glue industry, and the Soybean Exhibit at the Chicago World's Fair. A chart shows the exploitation of the soybean. Trading rules of the National Soy-bean Oil Manufacturers Association and the New York Produce Exchange in oils are mentioned.

523. Horvath, A. A. The soybean oil of China and its manifold uses. 57pp. Shanghai, Bureau of industrial and commercial information, Ministry of industry, commerce and labor [19?] (Booklet Series No. 13) 280.9 C44 no. 13
The author takes up the physico-chemical properties of soybean oil, the refining of crude soybean oil, the process of hardening the oil, its uses for food, soap making, the manufacture of waterproof cement, glycerine from soybean oil, rubber substitutes and artificial petroleum from it.
524. Howell, E. V. Soy beans and soy bean oil. Amer. Pharm. Assoc. Jour. 7(2): 159-163. February 1918. 396.9 Am33J
Bibliography, pp. 162-163.
The writer outlines the history of the bean and its importance and uses as food. He states that "while the chief use, so far, of the oil has been for soap and paints, the particular object of this paper has been to call attention to the use of soy oil in pharmaceutical preparations."
525. Jenkins, E. H., Street, John Phillips, and Hubbell, C. D. Tests of soy beans in 1916. Conn. Agr. Expt. Sta. Bull. 193, 12pp. New Haven, 1917.
"The purpose of this bulletin is to record the results of the Station's tests at Mount Carmel in 1916 and certain other data which concern the soy bean crop.
"There are four products derived from this crop, one or more of which give it importance in different sections of the country. These are the oil, the oil cake or meal, the seed, and the forage, which is used either for hay, ensilage, soiling, cattle, or as a green manure." - p. 3.
526. Johnson, E. F. Is the soybean over-exploited? Grain and Feed Rev. 26(5): 14-18. January 1937. 280.28 C78
Address delivered before the Agricultural Club at Chicago, Nov. 12, 1936.
The food and industrial uses and possibilities of the soybean are emphasized. The writer feels, however, that "to heap on to the soybean additional praise or credit to which it is not entitled, may prove as bad as to encourage the youngster in his thought that he can whip Popeye."
This address is abstracted under the title "New uses for soybeans" in Grain & Feed Jours. Consolidated 77(11): 483. Dec. 9, 1936. 298.8 G762
527. Jones, D. Breese. Soybeans - their food value. 6pp., processed. Washington, D. C., U. S. Dept. Agr., Bur. Chem. and Soils, 1938. (MC-28) 1.9 C49Mc no. 28
This report gives the chemical composition of soybeans, the

uses for the oil, the vitamins and proteins in soybeans, the composition of soybean flour and soybean milk, and soybeans as a feed for livestock.

528. Jordan, Sam. Soy beans from soup to nuts. A new crop with many uses both on farms and in factories. Country Gent. 83(39): 7, 34. Sept. 28, 1918. 6 C833
"So here we have a small glimpse of what their future really is. A crop with a great industrial importance, a crop with known forage and manurial possibilities, and a crop holding forth a beneficent promise as an essential food, soy beans will soon be giving corn and wheat a close race for the more prominent places on our agricultural map."
529. Lohse, H. W. The soya bean as a food product and industrial raw material. Canad. Chem. and Metall. 20(7): 224-225. July 1936. 381 C16
"Paper presented at Canadian Chemical Convention, Niagara Falls, June, 1936."
The writer discusses the chemical characteristics of the soybean, its food uses as milk and flour (the milk being manufactured in Canada by Milquo Limited), and the uses for soybean oil and the extracted meal.
530. Lovell, John H. Soy bean as a honey plant. Gleanings Bee Cult. 57(10): 646-648. October 1929. 424.8 G47
The food and industrial uses of the soybean are mentioned. It is concluded that "without more reliable evidence than is at present available, the writer does not think that soybean should be ranked as a honey plant."
531. Lynch, R. Irwin. The soy bean. Gard. Chron. (London) 63(1622): 38. Jan. 26, 1918. 80 G162
The various food and industrial products made from soybeans are briefly mentioned.
532. Megee, C. R. Soybean production in Michigan. Mich. Agr. Expt. Sta. Circ. Bull. 161, 14pp. East Lansing, 1937.
"The adaptation of soybeans in Michigan is limited to those sections and soils upon which corn can be grown for grain purposes. The soybean is a legume high in protein, and the seeds are high in oil. There are many uses that may be made of soybeans and soybean products. These uses may be placed in three general groups as: uses on the farm, uses in industry and manufacturing, and for human consumption." - p. 3.
533. Morris, Curtis. Soy bean greatest natural food. Regional chamber urges East Texas farmers to plant legume because of its many uses. East Texas Chamber Con. East Texas 10(2): 15, 32. November 1935. 6 Ea73
Industrial and food uses of the bean and its oil are brought out.

534. Morse, William Joseph. Soybean utilization. U. S. Dept. Agr. Farmers' Bull. 1617, 28pp. Washington, D. C. Issued January, 1930; revised March 1932. 1 Ag84F

Contents: Introduction, pp. 1-2; Soybeans for human food, pp. 2-6; Soybeans for livestock, pp. 6-9; Soybeans for oil, pp. 9-12; Soybean meal, pp. 12-16; Soybeans for hay, pp. 16-19; Soybeans for pasturage, pp. 20-21; Soybeans for silage, pp. 22-23; Soybeans for soilage, p. 23; Soybeans for soil improvement, pp. 24-26; Soybean straw, pp. 26-27.

A Spanish translation of this appears under the title "La utilización de la soja en diversas industrias" in La Hacienda 25(7): 298-301; (8): 347-349; (9): 394-396. July-September 1930. 6 H11

A translation by Erma López Seña of the 1930 edition of this study under the title "Utilización de la Soya" is published as [Cuba] Estación Experimental Agronómica Circ. 69, 40pp. Santiago de las Vegas, Habana, 1930. 102 C89 no. 69. It contains in addition, on pp. 37-40, a supplement on the cultivation of the crop in Cuba.

535. Morse, William Joseph. Soy beans in the cotton belt. 6pp. Washington [Govt. print. off.] 1915. 1 Ag863Sy

The use of soybeans for hay, for pasture, for soiling, for ensilage, for seed and for human food, storing of the beans, and the value of the oil and cake are pointed out.

Also published as S.R.S. Doc. 43, Ext. Ser. No. A-85. 7pp. 1 Ex89D no. 43

536. Moscow. Nauchno-issledovatel'skii institut soi i spetsial'nykh kul'tur. Soia i nov'ie kul'tur'i. 68pp. Moskva, 193-? (Bulletin no. 3) 60.39 M85

Text in Russian with summaries of some of the articles in English.

Partial contents: - The determination of the quality of soybean seeds, by P. P. Bordakov, pp.13-17; Complex method of industrial utilization of the soybean, by S. S. Perov, pp. 48-50; New sources of national food supply, by D. E. Belenky, pp. 52-53; Kounyys from soybean milk, by D. E. Belenky and N. N. Popova, pp. 53-54; Bacterial method of obtaining "to-fu", by D. E. Belenky and N. N. Popova, pp. 55-56; The soybeans as a meat substitute in microbiological practice, by D. E. Belenky, pp. 56-57; Utilization and rationalization in the obtaining of "to-fu", by M. Prakhin, pp. 58-60; Soybean oil-cake in poultry raising, by A. A. Prevo, pp. 61-64.

537. Nenzek, L. P. Economic possibilities of the soyabean. Field Illus. 32(5): 284-285, 322. May 1922. 42.8 Sp6

Value of soybean oil, results of paint exposure tests made at Washington, D. C., in connection with the Institute of Industrial

Research, methods of extracting the oil, use of the cake or meal as food, commercial food products made from the beans, and their chemical trade uses, are taken up.

538. Oil, paint and drug reporter. Green book buyers directory, 1937-38, twenty-fifth year. 1004pp. New York, Oil, paint and drug reporter, inc., 1937. 225 O15

See under Soybeans, Soybean cake and meal, Soybean flour, Soybean glue, Soybean oil, Soybean oil acids, Soybean oil, blown, and Soybean oil stearine, in Part I for firms selling those products.

539. Pacific northwest chemurgic conference. Proceedings. 134pp. [Olympia?] Published by Ernest N. Hutchinson, secretary of state, 1937. 281.9 P11

"Pacific Northwest Chemurgic Conference with Washington State Planning Council, Spokane, Washington, March 22-23, 1937."

Soy flour, by E. E. Roquemore, pp. 93-95, outlines the protein, vitamin and mineral content of soybean flour, and its uses in the sausage manufacturing industry and in baking.

Plastics and solvents including casein from the farm, by J. Allen Harris, pp. 104-109, includes a brief passage on soybean plastics.

540. Phillips, J. B. The utilization of the soya bean. Soc. Chem. Indus. Jour. 53(29): 627-628. July 20, 1934. 382 M31

"Lecture delivered before the Montreal Section of the Society on Feb. 21, 1934."

Uses and consumption for various uses in the United States, are included.

541. Products obtained from cotton seed and soy beans. Prog. Farmer 31: 1443. Dec. 16, 1916.

Not examined.

542. The prolific soya bean. Sci. Amer. 116(20): 492. May 19, 1917. 470 Sci25

The article describes the general uses of the bean, and the use of a solvent in extracting the oil from it.

543. Rouest, L. Le soja et son lait végétal. Applications agricoles et industrielles. 157pp. Lucie-Grazaille, Carcassone, auteur, 1921. 60.3 R75 (Bibliothèque de Technique Agricole Moderne)

Bibliography, pp. 153-154.

Ch. IV, pp. 72-80, takes up the use of the soybean for forage; Ch. V, pp. 81-91, includes information on yields and chemical composition of the bean and its use in animal feeding; Ch. VI, pp. 92-97, brings out the value of the soy oil and cake and production

of the cake in various countries, 1915-1919; Ch. VII, pp. 98-110, describes the making of soy milk, its composition, powdered soy milk, soy milk in animal feeding, and in this connection its use as a preventive of tuberculosis transmission and as a means of conserving animal milk and butter for human consumption, and the value of soy milk cake; Ch. VIII, pp. 111-116, discusses the use of the soybean in industry; and Ch. IX, pp. 117-128, the many uses of the soybean in human nourishment.

544. Slawson, H. H. Agriculture's Jack of all trades. Introducing the versatile soybean with which you may either build automobiles or run them and in which many people see possibilities for farm relief without benefit of subsidy. Nation's Business 24(9): 24-26, 94. September 1936. 286.8 N212
Recent research programs on the uses of soybeans, and the new industrial uses for them are brought out.
545. Smith, Isaac A. Soy beans and secrets of legume inoculation. 22pp. Warren, Indiana, I. A. Smith, 1913. 77 Sm5
Special uses for soybeans and cultural methods are briefly given, pp. 2-6.
546. Smith, Walter G. Soy bean: (a) its uses; (b) the action of its enzyme, urease, upon urea. Dublin Jour. Med. Sci. 141(533, ser. 3): 299-307. May 1, 1916. Army Medical Library
Includes on pp. 299-300, a brief discussion of the food and industrial uses of the bean.
547. South Manchuria railway co., Bureau of agriculture. Soya beans in Manchuria. 40pp. Dairen, South Manchuria railway co., 1926. 60.3 So82
Ch. III. Uses of Beans, pp. 10-18, gives uses as food, cattle feed, and fertilizer, and uses for the oil.
548. Soybean show train to tour East. Railway Age 103(8): 246-247. Aug. 21, 1937. 288.8 R136
A description of the train on the Pennsylvania railroad "housing an exhibition and equipment for the demonstration of the uses and method of production of the soybean" which was to tour New Jersey, Pennsylvania, Ohio, Indiana and Illinois. "The tour is under the sponsorship of the American Soybean Association, in cooperation with the U. S. Department of Agriculture, several state agricultural colleges, the National Soybean Processors Association and the Pennsylvania."
549. Soy bean useful crop. May be utilized in greater number of ways than almost any other agricultural product. U. S. Dept. Agr. Weekly News Letter 4(27): 3. Washington, D. C., Feb. 7, 1917. 1 Ag84W

Various ways of utilizing the bean as human food, as stock feed, as fertilizer and in oil mills, are cited.

Also in *Coop. Manager and Farmer* 6(8): 40-41. May 1917.
280.28 C78; in *Va. Dept. Agr. and Immigr. Year Book 1917-1918*:
174-176. Richmond, 1918. (Bulletin 126) 2 V81B; and in *Jersey*
Bull. 36(9): 323, Feb. 28, 1917. 43.8 J48

See also *The soy bean. Jour. Home Econ.* 9(4): 183-184.
April 1917. 321.8 J82; and *Soybeans for human food. Ohio Farmer*
139(10, whole no. 3600): 377. March 10, 1917. 6 Oh3

550. Soybeans. *Purdue Agr.* 17(2): 28. November 1922. 6 P97
Soybeans as replacement for clover and for pressing for oil
are discussed.
551. Soy beans; which may be glue, milk, cheese, sauce, varnish, axle grease,
fertilizer, soap, soup, buttons, artificial leather, enamel.
Fortune 1(5): 102, 104. June 1930. **Libr. Cong.** HF5001.F7
The history of the soybean in various countries and its uses
in the United States are outlined.
552. Steen, Herman. Many products made from soybeans. Commercial demand
increasing every year. *Prairie Farmer* 101(45): 1487, 1502. Nov.
9, 1929. 6 P883B
Gives the principal uses of the soybean, including new indus-
trial uses.
553. Strickler, Paul B. Uses of soybeans in feeding. New methods of utilizing
an old crop. *Wallaces' Farmer* 56(14): 469. Apr. 4, 1931. 6 W15
Uses in industry and as food for the soybean are mentioned,
and its uses in feeding are discussed.
554. Tonnelier, A. C. *La soja hispida y sus aplicaciones.* 16pp. Buenos
Aires, Ministerio de agricultura, Dirección general de enseñanza
agrícola, 1912. 77 T61
Includes a description of various soybean products and their
chemical composition.
555. Trabut. *Le soja legume.* Academie d'Agriculture de France. Comptes
Rendus 13(18): 611-613. May 25, June 1, 1927. 14 P215Bc
Uses to which the soy is put in various countries are outlined
and its use in France is urged. Value of the bean for human food
is brought out.
556. Turner, A. Grenville. A wonderful bean. Bounteous nature's gift from
the East. Manifold uses of the soybean. *Milling* 69(25): 695-696,
698. Dec. 17, 1927. 298.8 M622
How the bean and its oil can be used, the soybean as a seed
crop, and methods of oil extraction are taken up. Uses for the
bean and methods of extraction used in the United States are included.

557. El valor alimenticio e industrial del frijol soya. Revista de Agricultura [Cuba] 20(7): 30-36. July 1937. 8 Ag88Re
According to an editorial note, the data for this publication were taken from a study on the soybean published by the Agricultural Experiment Station of Newark, U. S. A.
The alimentary and industrial value of the soybean are described in this article. Its three constituents of most value to industry are said to be the oil, phosphates and proteins.
558. Venturi, Romolo. La soia, come materia prima nella fabbricazione di importanti prodotti terapeutici ed industriali. Bollettino Chimico Farmaceutico 65(16): 481-485. Aug. 30, 1926. Army Medical Library
An analysis of the various plant parts of the soybean and their adaptation to use as food, medicinal, technical and industrial products.
559. Vision and the soy bean. Home Acres Ed. of Garden Digest 7(old ser. v. 23)(5): 10-11. September 1935. 80 G1623.
Published as Pt. 2 of Garden Digest, Home Acres Edition on alternate months.
The author describes the research in soybeans at the Edison Institute at Dearborn, Michigan.
560. Waal, A. J. C. de. Over soja-producten. Chemisch Weekblad 14(15): 344-356. April 14, 1917. 385 C42
Describes the work done by men in different countries on various soybean preparations and includes a paper by Yu Ying Li entitled "Procédés et Dispositifs pour la Transformation Intégrale du Soya" including the food and industrial uses of the soybean.
561. Wheeler, Agnes A. Consider the soy bean. Better Fruit 32(7): 10, 14. January 1938. 80 B46
The increase in soybean production in the United States, their value as food and the products made from them, their value as feed for sheep and poultry, and the various uses for soybean oil, are among the topics considered.
562. White, Buxton. The soy bean industry of eastern North Carolina. N. C. Agr. Col. Ext. Circ. 9, 8pp. Raleigh, 1916.
Includes sections on the seed production industry, and on the uses of soybeans for oil, hay, as a pasture crop, as a soiling crop, and for ensilage.
563. Williams, C. B. Soy-bean products and their uses. N. C. Agr. Expt. Sta. Circ. 34, 7pp. Raleigh and West Raleigh, 1916.
The writer brings out the wider usefulness for soybeans, the beginnings of manufacture of soybean oil and meal from domestic

soybeans in the United States by the Elizabeth City [N. C.] Oil and Fertilizer Co., the uses for soybean oil, the composition and exchange value of the meal, prices paid for beans by the oil mills, soybean meal as a feed, and as human food. A diagram shows the products secured from a ton of soybeans, and the material made from these products.

564. Williams, C. B. Soy-bean products and their uses. Pure Products 15(7): 339-345. July 1919. 389.8 P97
This is a discussion of the increased soybean utilization by mills, uses for the oil extracted and for the meal, prices paid for beans by the oil mills, quantity of oil imported into the United States, the use of soybean meal as a feed, and food products made from it.
565. Williams, C. B. Soybeans: a future economic factor in North Carolina. N. C. Agr. Col. Ext. Circ. 57, 11pp. Raleigh and West Raleigh, 1917.
The writer treats his subject under the following heads: Soybeans versus cowpeas; Soybeans versus peanuts; Soybeans for the improvement of the soil; Soybeans for feed for live stock; Soybeans for human consumption; Utilization of soybeans by cotton oil mills; Products secured by oil mills in crushing soybeans.
566. Winters, S. R. The soybean, the "wonder" bean. Hoard's Dairyman 82(12): 370. June 25, 1937. 44.8 H65
The author points out the increase in production of soybeans in the United States, the uses for the crop as food and in industry as well as on the farm.
567. Zmigrod, Stanislaw. Oil and flour from the soy bean. Przenyse Chemiczny 14: 116-117. 1930.
. Not examined.
"A review of the properties and uses of soy-bean oil and flour." - Chem. Abs. 24(19): 4947. Oct. 10, 1930.

Industrial Uses

568. Barnard, H. L. Value of the soybean. Flour & Feed 36(11): 19-20. April 1936. 298.8 F66
"It is not my purpose, however, to discuss the values of soybeans in terms of human or animal food. I wish to point out new uses which are potentially of great importance which offer new outlets for farm crops. It is these uses which will open markets for this century-old legume without displacing crops which are of themselves sufficient for the need..."
The work of the Farm Chemurgic council in studying soybeans as an industrial raw material, is mentioned.

569. Barr, J. E. What price soybeans? 5pp., processed. [Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, Division of hay, feed and seed, Nov. 1, 1933] 1:9 Ec712Wp
"The soybean industry in the United States is making definite progress and it is more and more evident that this crop is destined to play a leading part in our agricultural and industrial life. This is apparent more from the development of broader commercial uses for the soybean than from the steadily increased production during recent years. The latter will be encouraged by prices which are attractive to growers; these prices in turn will depend greatly on the outlet for soybean products for industrial purposes. There are definite indications that this field is developing and that with more nearly normal industrial activity, it can absorb the products from more soybeans than are now produced in the United States."
570. Beckel, A. C., Brother, G. H., and McKinney, L. L. Protein plastics from soybean products. Relation of water content to plastic properties. Indus. and Engin. Chem. 30(4): 436-440. April 1938. 381 J825
"Literature cited", p. 440.
Results of a study made at the U. S. Regional Soybean Industrial Products Laboratory, Urbana, Ill.
"Soybean protein has been found to possess properties which permit the production of two different types of plastic material. Addition of water to soybean protein or meal leads to a product similar to casein plastic, whereas reduction of the moisture content below 5 per cent gives a zeinlike plastic. A new method for measuring plastic flow has been developed and applied." - Ed. note.
571. Berthelot, Albert, Amoureux, G., and Deinse, F. van. Sur les avantages de la peptone pepsique de tourteau de soya pour la préparation des milieux de culture. Société de Chimie Biologique. Bulletin 16(9): 1565-1567. November 1934. 383 Sol.
Describes the advantages of using peptone in cultural media which has been prepared by the peptic digestion of soybean press-cake.
572. Burlison, W. L. Soybean for plastics. Grain & Feed Jours. Consolidated 77(8): 362. Oct. 28, 1936. 298.3 G762
"The soybean is proving to be an excellent source of raw material for the plastic industry. From a ton of soybeans are produced about 250 pounds of oil, and 1600 pounds of meal containing approximately 40 percent protein..."
573. Chang, Ke-Chung, and Chao, Yung-Sheng. Vegetable casein from soybean and peanut. Chinese Chem. Soc. Jour. 3(2): 177-182. June 1935. 385 0443
Experiments in obtaining the casein and its preparation for glue and plastics are described.

574. Chase, Herbert. Soya bean plastics. Brit. Plastics 7(83): 516, 519-521; (84): 564. April-May 1936. Libr. Cong. TP986.A1B6
Utilization of the soybean in the Ford plant and method of preparing the plastic material.
575. Corman, R. H. The soybean. Penn State Farmer 2(8): 311, 318. May 1937. 276.8 P38
The advantages of the crop, processing the beans, and uses for the soybean in industry are discussed. The writer concludes that "if the people of the United States wish to improve the soybean industry, the farmers will have to cooperate with the manufacturers to carry on chemical research and establish more and better by-products from the soybean industry."
576. D'yachenko, P. [Plastics from the vegetable casein of the soy bean.] Plasticheskie Massui, no. 2, pp. 13-15. March-April 1933.
Not examined.
577. Farm chemurgic council. A plan coordinating agriculture, industry and science. 40pp., processed. Dearborn, 1935. Pam. coll. (Chemurgy)
Points out, pp. 3-5, the growing interest in soybeans as industrial raw material, and lists needed research for this purpose.
578. Ford soy bean requirement 1,000,000 bushels yearly for million car output. Automotive Indus. 73(17): 541. Oct. 26, 1935. 291.8 Au82
Methods of utilizing the soybeans in the Ford Motor Company's plant.
579. Ford uses soya bean in plastics. Chem. and Metall. Engin. 42(6): 313. June 1935. 381 EL2
Quotes statement sanctioned by the Ford Motor Co. on the utilization of soybean oil and meal in the Ford plant.
580. G., M. Soya-bean casein glue. Veneers 22(6): 37. June 1928. 99.82 V55
Reply to a series of questions by Fox in Veneers 22(5): 36. May 1928, as to whether soybean casein glue is a true glue, its strength as compared with other glues, the extent of its development and use in the trade, its durability, its spread, its degree of workability and its price in relation to other glues.
581. Galley, H. W. Industrial use of soybeans. Grain & Feed Jours. Consolidated 74(4): 161. Feb. 27, 1935. 298.8 G762
"From a paper read...at convention of the Farmers Grain Dealers Ass'n of Illinois."
Need for cooperation between the farmer and processor and the need for tariff protection on soybean oil and meal are stressed.
582. Génin, G. La caséine végétale; propriétés et emplois. L'Industrie Chimique 18(214): 784-785; 19(216): 6-8. November 1931; January 1932. 383 In2

In this article are described the preparation of the vegetable milk from soybeans from which the casein is derived, the preparation of casein in industry, and its industrial uses.

Abstracted in *Le Génie Civil* 100(14): 352. April 2, 1932.
290.8 G29

583. Grodzinski, Paul. [Pressed artificial resin objects in automobile construction.] *Kunststoffe* 26: 141-144. 1936.
Not examined.
"This illustrated review emphasizes soybean resin products." - *Chem. Abs.* 30: 7719. November-December 1936.
584. Hadert, Hans. Sojabohnenerzeugnisse in der lack- und klebstoffindustrie. *Der Farben-Chemiker* 7(12): 452-455. December 1936.
Bur. of Standards, no. 46592
A discussion of the utilization of the soybean in the varnish and adhesive industries.
Also in *Gelatine, Leim, Klebstoffe* 4: 207-213. 1936. (Not examined)
585. Hori, S., and Bokura, U. Soy bean cake as a substitute for peptone in the preparation of the nutrient media. *Phytopath. Soc. Japan. Ann.* 1(1): 27-31. 1918. 464.9 P562
Not examined.
"After experiments with commercial material including ammonium sulphate, Kinako powder, and soy bean cake, it was found that the most satisfactory results were given by soy bean cake. Information is furnished regarding the preparation and expense of this medium." - *Expt. Sta. Rec.* 42(4): 334. March 1920.
586. Horvath, A. A. Soya phosphatides. *Jour. Chem. Ed.* 14(9): 424-426. September 1937. 381 J826
The author describes the two products, lecithin and cephalin, methods of extracting them, and their uses.
587. Horvath, A. A. The soybean industry. 221pp. New York, The Chemical publishing co., 1938. 309 H78
Bibliography, pp. 191-197.
Among the subjects taken up in this work are the various processing methods for the soybean, commercial and laboratory extraction of phosphatides, the refining of soybean oil and uses for the oil, uses of the phosphatides, and the preparation of plastics.
588. Iinuma, Toru, and Mashino, Minoru. On the properties of soya bean protein. I. The influence of the preceding treatments on the solubilities of protein; II. Solubility of soya bean protein in calcium thiocyanate solution; III. Shearing strength of soya bean protein as adhesive; IV. Properties of the protein as water paint; V. Reactivities with formaldehyde; VI. The supplementary studies

of the properties of soya bean protein. Soc. Chem. Indus. Japan Jour. 36(6): 310B-311B; (7): 373B-375B; (8): 455B-456B; (9): 506B-507B. June-September 1933. J385 J82

These are English abstracts in the supplemental binding of a series of articles in Japanese in the main binding of the periodical.

589. Jardine, James T. The use of Bankhead-Jones funds to promote a co-ordinated program of research between the states in cooperation with the United States Department of agriculture. 14pp., processed. [Washington, D. C., U. S. Dept. of agriculture, Extension service, 1936?] 1.9 Ex892Use

"Presented before the Experiment Station Subsection of the Association of Land-Grant Colleges and Universities, at the Houston meeting, November 17, 1936."

The principles and procedure in founding research laboratories under the Act are given, including (p. 7) the soybean research laboratory at the University of Illinois.

590. [Knight, Henry G.] New markets for soybeans. Prairie Farmer (Ill. ed.) 108(7): 4, 27. March 28, 1926. 6 P883B

"Still wider markets for Illinois' lustiest infant farm industry are expected to follow the establishment of a new government soybean research laboratory at the University of Illinois..."

"Director will be Dr. O. E. May, working under Dr. Henry G. Knight, chief of the United States Bureau of Chemistry and Soils, and an advisory committee representing the states of Illinois, Indiana, Iowa, Minnesota, Wisconsin, Michigan, Ohio, Missouri, Kansas, Nebraska and the Dakotas..."

Most of the article comprises a statement made to the Prairie Farmer by Dr. Knight, who discusses the objectives of the new laboratory, and the reasons for its establishment. "Funds for operating this laboratory come from the Bankhead-Jones Act which provides for a limited number of laboratories in the major agricultural regions."

591. [Knight, Henry G.] The useful soybean. 4pp., processed. Washington, D. C., 1938. Pam. coll.

"A Radio Talk presented Thursday, February 3, 1938, under the auspices of Science Service, over the Columbia Broadcasting System..."

This is an interview by Mr. Watson Davis, director of Science Service, with Mr. Henry G. Knight, Chief of the Bureau of Chemistry and Soils. Mr. Knight describes the work of the U. S. Department of Agriculture's Regional Soybean Industrial Products Laboratory at Urbana, Illinois; the numerous uses in industry for the soybean and the making of plastics from it; and the great expansion and increase in the production of soybeans in the United States in the past few years. Twelve state agricultural experiment stations are said to be cooperating with the soybean laboratory.

592. Kraybill, H. R., Smith, R. L., and Walter, E. D. The isolation of sucrose from soybeans. *Amer. Chem. Soc. Jour.* 59(11): 2470-2471. November 1937. 381 Am33J
Methods used in obtaining sucrose from soybeans.
"Department of Agricultural Chemistry, Purdue University Agricultural Experiment Station, Lafayette, Indiana, and the Regional Soybean Industrial Products Laboratory, U. S. Department of Agriculture, Urbana, Illinois." - Signature at end of article.
593. Lin, F. C. [A soy-bean digest medium for diagnostic work.] *Chinese Med. Jour.* 48: 571-576. 1934.
Not examined.
"...This medium can replace the more expensive meat infusion in routine work, and may also be employed for the preservation of stock cultures." - *Chem. Abs.* 29: 1114. Jan.-May 1935.
594. Lougee, E. F. Industry and the soy bean. *Modern Plastics* 13(8): 13-15, 54-57. April 1936. 309.8 P69
This is an account of the "experimental development of soy bean plastics by the Ford Motor Co. The information was obtained by personal interviews with Ford executives both in the Engineering Laboratory at Dearborn and in the River Rouge molding division of the company."
The article quotes Mr. Ford's theory of making partners of industry and agriculture, since the one needs employment for its surplus men, and the other lacks a market for its product. This has resulted in the starting of a large plastic plant to utilize agricultural products such as the soybean. "The general plan is to produce a simple processing unit which will satisfactorily separate the oil from the beans. This unit is to be available to farmers in rural communities who can raise beans in the summer and process them in winter."
595. McCarroll, Hudson. Address of Hudson McCarroll, Chief chemist of Ford motor Co., at Illinois farmers grain dealers convention, Chicago. *Farmers' Elevator Guide* 31(4): 3-5. Apr. 5, 1936. 280.28 Am3
The work done at the Ford plant at Dearborn, Michigan, in utilizing the soybean in the automobile industry, and the process followed, are described.
596. Maruri, Aurelio. Cultivo del frijol soya. *Revista de Agricultura [Cuba]* 20(1): 37-49. January 1937. 8 Ag88Re
The industrial uses for the soybean and its importance in the United States are brought out.
597. Más información sobre el frijol soya y su importancia industrial. *Revista de Agricultura [Cuba]* 20(6): 111-113. June 1937. 8 Ag88Re
This is a discussion of the soybean and its industrial importance. It takes up the various uses for the bean, extraction of the oil, and the industrial possibilities of the crop for Cuba.

598. Masse, Sidney M. Soybean extract as a deflocculating and decolorizing agent. Chem.-Analyst no. 27, pp. 18-19. October 1918. 381 C424
"Clouded solutions, especially those of an albuminous nature, may be quickly cleared by an extract prepared from the bean. In serology its use may be adapted for separating blood corpuscles from the serum with fine results." The preparation of the extract is outlined.
599. Mecheels, Otto. Lecithin in der textilindustrie. Melliand Textilberichte 12(2): 123-124. February 1931. 304.8 T312
The writer discusses the use of lecithin obtained from soybeans in the textile industry and methods to be followed in preparing it.
600. Midwestern conference of agriculture, industry and science, Omaha, Neb., 1937. Condensed proceedings of the Midwestern conference on agriculture, industry and science, Omaha, Nebraska, March 9-10, 1937. 125pp., processed. Dearborn, Michigan, Farm chemurgic council, 1937. 381.9 M585
Industrial utilization of farm products, by Dr. Henry G. Knight, pp. 10-16, contains a paragraph on the Soybean Products Industrial Utilization Research Laboratory at the University of Illinois.
The soy bean, by I. C. Bradley, pp. 71-75, traces the increasing importance of the soybean industry and the "sequences of events which have brought the soy bean into such prominence."
U. S. Regional Soy Bean Industrial Products Laboratory, by O. E. May, pp. 75-80, outlines the plan and objectives of the Laboratory, and describes the projects that have been undertaken in the industrial utilization of the soybean.
601. Minatoya, S., and Kurahashi, N. The effect of soya-bean-lecithin on vulcanization of rubber, and the manufacture and uses of powdered rubber prepared by the use of soya-bean-lecithin. Soc. Chem. Indus. Japan Jour. 37(4): 477-479. April 1934. J385 J82
Article in Japanese.
Alternate title and abstract in English in supplementary binding, pp. 207B-208B.
"Soya-bean lecithin has the same effect as the lipin of Hevea latex on the vulcanisation of rubber. Soft rubber articles made from raw rubber powder prepared with the aid of this lecithin are inferior in physical properties to those manufactured from standard raw rubber, e.g. smoked sheet, but ebonite so prepared compares favourably with that from ordinary rubber except in electrical qualities." - D. F. T. in Brit. Chem. Abs (Suppl. to Soc. Chem. Indus. Jour.) B: 726. Aug. 24, 1934. 382 B773
602. Morse, William Joseph, and Fuller, G. C. Soybean investigations in the United States. Herbage Reviews 1(2): 55-58. June 1933. 64.8 In7H

"The soybean is no longer an unfamiliar crop to most farmers of the United States and it has also become in a brief period the object of considerable attention of numerous industries. In spite of the extensive investigations that have been conducted with the soybean, the work of developing this plant to its fullest possibilities is just beginning. The explanation for this lies in the fact that the major part of our studies to date have been devoted to the adaptation and development of new varieties. More recently our attention has been called to the great value of the soybean as a food crop and for industrial purposes. At the moment our attention and that of the agricultural worker generally is focussed on these additional potentialities of the soybean and its by-products - oil and meal - and the crop is gradually assuming its rightful proportion of a major crop in the agriculture of the United States."

603. New fiber made from soybean protein to be used in autos. Sci. News Letter 33(19): 302. May 7, 1938. 470 Sci24

"A new synthetic fiber, made from the protein material of soybeans, was exhibited for the first time by Dr. R. A. Boyer of the research department of the Ford Motor Company before the meetings of the Fourth Annual Conference of the Farm Chemurgic Council, at Omaha.

"The new fiber, destined for use in automobile upholstery, was developed as an outgrowth of work by Italian chemists in making a synthetic wool from milk casein..."

The ways in which soybeans may be used in automobile manufacture are listed, and the blending of soybean oil and tung oil as a mixture for use in paints is briefly discussed.

604. Palladin, N. V., and Sitin, L. A. Die gewinnung von technischen sojaciweiss ("Rasein") und seine verwendung zur leimherstellung. Moscow. Zentrales Biochemisches Forschungsinstitut der Nahrungs- und Genussmittelindustrie. Schriften 1(6): 235-264. 1932. 389.9 M85

Text in Russian. Alternate titles and conclusions in German.

Describes the obtaining of commercial soybean casein and its use in making adhesives.

605. Plastic made of soybean offers use for farm products. Sci. News Letter 33(5): 71. Jan. 29, 1938. 470 Sci24

Brings out very briefly the uses for soybean plastic in the Ford plant, the research being done at the Soybean Industrial Research Laboratory at Urbana, Illinois, the great increase in soybean acreage in this country, and the industrial uses of the bean.

606. Rewald, B. The phosphatides as commercial products. Chem. Trade Jour. and Chem. Engin. 101(2619): 86-87. July 30, 1937. 382 C422

"From paper (in German) presented to the...Fifth International and Chemical Congress of the Agricultural Industries." - Note.

The soybean is described as the predominant source of phosphatides in the vegetable line, and the chemical characteristics of the soybean phosphatide, usually known as "lecithin," and its uses in the foodstuffs industries and in rubber and leather manufacture are considered.

An extract from this paper is published under the title "Lecithin in food products" in *Canad. Chem. and Metall.* 21(8): 292, 307. August 1937. 381 C16

Another extract entitled "Phosphatides as commercial products" is printed in *Chem. Indus.* 41(3): 253-254. September 1937. 381 C426

607. Rickey, Lacey F. Processing soybeans. *Flour & Feed* 34(10): 20-21. March 1934. 298.8 F66

"This paper will attempt to set forth briefly the chief products made from soybeans and the methods used in processing the beans."

608. Rothéa, F., and Nielloux, F. La lécithine végétale de soja. *Journal de Pharmacie et de Chimie* 18(10): 443-445. Nov. 16, 1933. (125e Année, 8e Série.) 383 J825

The extraction of vegetable lecithin from the soybean with the object of using it in the manufacture of chocolate.

609. Salazar, Leopoldo G. The manufacture and chemical control of some soybean products under Los Baños conditions. *Philippine Agr.* 15(4): 219-231. September 1926. 25 P542

"Thesis presented for graduation, 1925, with the degree of Bachelor of Agriculture, no. 231; Experiment Station contribution no. 380..."

"Literature cited," p. 230.

"The objects of this work were: (a) to determine the possibility of preparing toyo [soy sauce] and tokua [bean curd] under Los Baños conditions; and (b) to determine the time at which the toyo contains the highest percentage of nitrogen."

610. Sato, Masanori. Preparation of a liquid fuel resembling petroleum by the distillation of the calcium-salt of soya-bean fatty acids. *Jour. Chem. Indus. Japan* 25(287): 13-24; 26: 297-304; 29(3): 109-115; 30(4): 242-267; January 1922, 1923, March 1926, April 1927. J385 J82

Text in Japanese.

Title varies slightly.

3d report has English title: "On the Preparation of Fuel Oil by Distillation of the Lime Soap of Soya Bean Oil," and is by Masanori Sato and Kwong Fong Tseng.

Abstracts of the articles in English are contained in the Supplementary Binding, pp. 2-5, January 1922; pp. 23B-24B, March 1926; pp. 73B-74B, April 1927.

Divided into 7 reports.

5th Report is by Masanori Sato and Hiide Matsumoto; 7th is by Masanori Sato and Chiyomatsu Ito.

611. Satow, Sadakichi. Manufacture of plastic products from proteid of soy bean. Tôhoku Imp. Univ. (Sendai, Japan) Technol. Repts. 3(4): 199-267. 1923. Libr. Cong. Tl.S616
The author first "followed Dr. T. B. Osborn's process in order to isolate the soy bean proteid, glycinine...
"He glutinized the isolated proteid...to a transparent pasty mass and then converted the mass into a hard product by means of the action of formaldehyde.
"Thus, (1) the special process in the isolation of proteid, (2) the glutinization process, and (3) the condensation process greatly differentiate the author's processes from those of former investigators.
Products manufactured from the soybean proteid are listed, pp. 266-267.
612. Satow, Sadakichi. The proteins of sojabean and their industrial applications. Jour. Chem. Indus. Japan 22(260): 851-877; (261): 953-968; (262): 1045-1058; 23(263): 1-25; (264): 109-135; (265): 219-236; (266): 321-342; (267): 425-439; (268): 527-543; (270): 811-830; (271): 905-910. October 1919-June, 1920, August-September 1920. J385 J82
Article in Japanese.
Alternate title and abstract in English in the Journal for September 1920, pp. 23-27.
Methods of extracting the oil are discussed.
613. Scherer, Robert. Casein; its preparation and technical utilisation; translated from the German. Ed. 3, rev. and enl., 216pp. London, Scott, Greenwood & son, 1921. 309 Sch2C
"The first part of this book treats upon the preparation of curd from milk, by decomposition of the suspended casein compound with acids or with rennet, and the purification and drying of the precipitated casein. Following this, the composition, properties, and reactions of casein are touched upon; then follows a description of the use of casein in the manufacture of paints, distempers, putties, plastic masses, artificial ivory, and other materials; the modes of applying these and their special features. The use of casein as a dressing for paper and cloth and its employment for waterproofing and other purposes is also described, and finally there are chapters on the use of casein in nutrient preparations, and the compounds of casein employed for medicinal purposes." - Preface, p. iv.
Ch. II. Casein: its origin, preparation and properties, pp. 3-29, has a section, p. 29, on Vegetable Casein, which describes a method for extracting casein from soybeans.

614. Shen, Tze-Hui, and Sun, Wei. [The preparation of emulsion paints from soybean casein.] Chiao-Tung Univ. Research Inst. Bur. Chem. Ann. Rept. 3: 52-62. 1936.
"The use of soybean casein as a substitute for milk casein in the manuf. of emulsion paints was investigated." - Chem. Abs. 31(9): 3303. May 10, 1937.
615. Silk from soy beans. New York Times, May 31, 1938. Pan. Coll. (Soybeans.)
This is a brief account taken from The Observer of London, on the making of silk from the soybean by Ryojei Inouye, a Japanese scientist. For his discovery Mr. Inouye has been awarded the Fujii prize by the Japan Physical and Chemical Research Society.
616. Sorensen, S. O. The outlook for soybeans in Minnesota. 5pp., processed. St. Paul, Minn., Feb. 11, 1938. Pan. Coll.
A talk given at the annual meeting of the Minnesota Farm Managers' Association.
"The topic will be considered from the standpoint of the Soybean as a raw material for industrial products and not as a hay and feed crop. The subject may be naturally divided into four points: 1. Are the climate and soil conditions in Minnesota suited to the cultivation of Soybeans, 2. Are there facilities available for processing Soybeans in Minnesota comparable to those in other regions, 3. Are the claims being made that there will be a greatly increased market for Soybean products in industrial fields if the crop is further increased, justified, 4. Of the crops which at least partially serve as a raw material for industry thus helping to diversify the markets for farm products, are Soybeans the best suited to Minnesota conditions?"
This article is abstracted in Markets 1(8): 11. April 14, 1938, under title: Soybean Situation in Minnesota is Analyzed.
617. Southern chemurgic conference, Lafayette, La. Condensed proceedings of the Southern chemurgic conference, Lafayette, Louisiana, October 15-17, 1936; Gulf coast chemurgic conference and the Tung oil association of America, Pensacola, Florida, October 20, 21, 1936. 180pp. Dearborn, Mich., Farm chemurgic council, 1936. (File no. 69) 281.9 So84
"Cooperating with both Conferences were: The Chemical Foundation, Inc., and Farm Chemurgic Council."
Industrial utilization of soy beans, by R. L. Himes, pp. 113-114. Soybeans as utilized at the Louisiana State Penitentiary, Baton Rouge, La.
618. The soy bean industry. Oil Miller and Cotton Ginner 41(2): 3-5. October 1932. 307.8 O15
Includes extracts of speeches delivered at the Washington meeting of the American Soybean Association, September 2 and 3, by W. H. Eastman on the Industrial Development of the Soybean Industry,

and A. A. Horvath who "stressed the importance of soybean flour as a national food of great importance because of its peculiar nutritional qualities." The history of the soybean crushing industry is traced, and the need for removal of prejudice against domestic soybean oil, the standards set up by the National Soybean Oil Manufacturers Association, the types of industries consuming the oil, and soybean trade conditions in the past year are considered.

619. Soybean plastic. Science 87(2246, Suppl. Science News): 8, 10. Jan. 14, 1938. 470 Sci2

A brief outline of research being done in soybean uses, and the uses to which soybeans and the plastic may be put.

620. Takayama, Yoshitaro. Utilization of the soybean. Soc. Chem. Indus. Japan Jour. 30(11): 194B-195B; 31(4): 77B-78B; 33(6): 91B-92B; 34(1): 31B-32B. November 1927, April 1928, March 1930, January 1931. J385 J82

These are English abstracts in the supplementary binding of Japanese articles in the main binding.

The first part deals with the "extraction of crude protein from the soybean cake or bean to utilize it as protein decomposition products."

The second part "deals with the treatment of the soybean with dilute sulphuric acid..."

621. Tanaka, Soichiro. On the manufacture of potash-lye from vegetable ashes and its application for the straw boiling process in the paper-making industry. Jour. Chem. Indus. Tokyo 20(234): 844-850. August 1917. J385 J82

"Various kinds of vegetable ashes were analyzed, but in the exptl. prepn. of KOH, only the soy bean pod ash and chestnut ash were used, owing to the deficiency of the other ashes. On lixiviating the soy bean pod ash containing 16.19% of K_2CO_3 with H_2O and adding CaO to the filtered liquor a yield of 52.7% KOH was obtained. On adding H_2O to the same ash and heating, and then adding CaO without filtering, the yield of KOH was 42.2%; chestnut ash containing 13.96% K_2CO_3 similarly treated, but with 3 lixiviations, yielded 75.5% KOH; after 4 lixiviations, 85.6%. The yield of the lye apparently depends upon the filtering process. The lye obtained from the soy bean pod ash was used for boiling straw and the straw thus treated was further bleached with bleaching powder, the results being satisfactory..." - Chem. Abs. 12(3): 309-310. Feb. 10, 1918.

622. Tarle, M. The soya bean and casein. China Jour. 20(4): 187-190. April 1934. 475 C44

The industrial uses for the casein, amount of production in various countries, and the method of extracting it are brought out. Its production on a large scale is urged for China.

623. Taylor, Robert L. How soybeans help build Fords. Chem. and Metall. Engin. 43(4): 172-176. April 1936. 381 E12
The ways in which soybeans are utilized in the automobile industry, the processes used, and Henry Ford's plan for the union of agriculture and industry are described. Pictures and a diagram show the machinery used in the processes.
624. Turner, F. Soya beans and soya bean oil. Oil and Colour Trades Jour. 87(1894): 311, 313-314. Feb. 1, 1935. 306.8 O152
Paper read at a meeting of the Borough Oil and Colour Students' Association on January 17.
Methods of oil extraction, separation of the proteins, the use of the protein in paints, the use of lecithin obtained from the beans, and the use of the oil in paints are discussed.
A translation of this in French appears under the title "Les Graines de Soja et l'Huile de Soja" in Les Matières Grasses 27(327): 10538-10540; (328): 10563-10564. July 15-Aug. 15, 1935. 307.8 M42
625. [Van Vlissingen, Arthur, Jr.] Automobiles and soybeans. An interview by Arthur Van Vlissingen, Jr., with Henry Ford. Rotarian 43(3): 6-8, 58-59. September 1933. Libr. Cong. HF5001.B7
Utilization of the soybean in the automobile industry is discussed. Mr. Ford is quoted as saying:
"Anything that can be grown for industry's raw materials will bring new revenue to agriculture, will help to raise prices of old-line, conventional crops. It will thus add doubly to the purchasing power of the farmers, and so will directly increase industrial activity and employment."
626. Wand, Frederick A. Varieties of soy beans best for manufacturing. Grain Dealers Jour. 62(3): 162. Feb. 10, 1929. 298.8 G76
A letter to the Grain Dealers Journal, listing the best varieties for manufacturing purposes, and pointing out the large potential market for soybean products.
627. Whole industries thrive on soy beans. Business Week (18):35-36. Jan. 8, 1930. 280.8 Sy8
The various uses for the soybean in industry are outlined and the plan worked out between Illinois farmers and the industrial users in 1928 and 1929 whereby the manufacturers guaranteed a minimum price to farmers for soybeans is cited.
628. Wieseahn, G. A. Soybean phosphatides and their uses; a review. Oil & Soap 14(5): 119-122. May 1937. 307.8 J82
List of references, p. 122.
"In pointing out the more or less successful, and wide application of soybean phosphatides, this survey also shows the need for further research, primarily towards gaining a clearer conception of the actual composition of the acetone-insoluble material of the 'lecithin' and of its effects, investigations of which have so far been undertaken in but a few fields."

629. Wong, T. Soy-bean industries. Jour. China Soc. Chem. Indus. 1: 83-92; 2: 139-144. 1923-24.
Not examined.
"Methods of ppn. and analyses are given for 9 products manufactured from soy bean, including oil, bean curd, bean milk, etc..." - Wm. H. Adolph in Chem. Abs. 17(14): 2514. July 20, 1923. (Abstract for first article.)
"Soy-bean cake contains 42.1% protein and 9.6% oil. This might be used for the manuf. of artificial marble and similar products." - W. H. A. in Chem. Abs. 19(10): 1634. May 20, 1925. (Abstract for second article.)

630. Working, E. J. Have soy beans moved up? Ill. Farm Econ. no. 22-23, pp. 104-107. Urbana. March-April 1937.
"Soybeans have moved up from the feed lot to the paint factory and finally to the kitchen. Statements such as this have often been made in the last two years, and the facts back of them are of great importance to soybean growers." Statistics are given to support these facts, and it is concluded that "if soybean oil is to maintain the importance it has gained during the last two years it will presumably be at the expense of selling at a lower price relative to other oils than it did prior to 1934. Thus, altho soybean oil consumption may be said to have moved up to the edible class; from the point of view of price it would perhaps be better to say that soybean oil has moved down from the drying oil to the edible oil class. The above, however, should not be taken to indicate that there will be a very drastic decline of soybean oil prices...we are in a period of generally increasing demand which will tend to counteract in part the future production increases..."

631. Yarn from soybean. Science 87(2264): 10. May 20, 1938. 470 Sci2
"Development of the process for converting soybean protein into fiber is credited to Ryojei Inouye, awarded recently the Fujii prize of the Physical and Chemical Study Council of Kyoto Imperial University, one of Japan's 'big six' universities, for his accomplishment."

Oil, Oilmeal and Oilcake

632. American society for testing materials, Sub-committee III of Committee D-1. Hexabromide test for determining purity of linseed oil. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 99, 16pp. [n.p.] July 1920. 306.9 P162C
Henry A. Gardner, Chairman.
"National Varnish Manufacturers' Association (Co-operating)."
Includes the directions sent to the members of the sub-committee, pp. 2-12, (Published as Circ. 83, by H. A. Gardner), and the results obtained by the various observers in using this test for linseed and soy oil, pp. 13-16.

633. Belyaev, N. [Use of soybean oil in paints.] Masloboino Zhirovoe Delo, no. 6(whole no. 47), pp. 15-16. 1929. 307.8 M37
Text in Russian.
"The oil cannot substitute linseed or hempseed oil." - Chem. Abs. in Brit. Chem. Abs. B: 1038. Nov. 14, 1930. 382 B773
634. Bingham, Albert B. The use of soya bean oil in paste colors. Drugs, Oils and Paints 35(10): 369-370. March 1920. Libr. Cong. TPl.D7
"Inasmuch as no real objection to the use of soya bean oil as a grinding vehicle for paste colors has been advanced, and since several specific advantages result from its use as such, it seems desirable that every effort should be made to overcome the prejudice against its use for this particular purpose."
635. Borushko, Michael. Soy-bean oil in the paint and varnish industry. Federation Paint Varnish Production Clubs, Off. Digest. No. 137, pp. 184-190. 1934.
Not examined.
"The history and the non-painting uses of soy beans and their oil are briefly described. The extn. method of obtaining the oil is preferred because of purity, uniformity and completeness. The literature on the suitability of the oil is reviewed and suggestions for study are given." - Chem. Abs. 28(17): 5688. Sept. 10, 1934.
636. Bowden, Arthur. Use of soybean meal for adhesive purposes. Oil & Soap 14(5): 114. May 1937. 307.8 J82
"A paper presented at the Fall meeting of the American Oil Chemists' Society, at Chicago, October 8-9, 1936."
Results of tests on the relative strength of treated and untreated soybean meal are cited.
637. Brightman, R. Note on a deposit in refined soya bean oil. Soc. Chem. Indus. Jour. 38(10): 120T-121T. May 31, 1919. 382 M31
Read at a meeting of the Manchester section, March 7, 1919.
This is a chemical study of deposit found in soybean oil which had been refined by means of sulphuric acid. Saponification and iodine values for the oils studied are given.
638. Burlison, W. L. Recent developments in the utilization of soybean oil in paint. Ill. Agr. Expt. Sta. Circ. 438, 8pp. Urbana, 1935.
"Reprint of an address delivered at the annual meeting of the American Soybean Association, Evansville and Lafayette, Indiana, August 21-23, 1935..." [q.v.]
The rapid progress in the development of industrial uses for the soybean, the studies made by the Illinois Station on the use of soybean oil for paint, and statements by members of the paint industry of the value of soybean oil, are cited.

639. Burton, C. S. Industrial magic in beans. Mag. Wall St. 58(12): 702-703, 737. Sept. 26, 1936. 286.8 M27
The industrial uses of soy oil and cake, and the advantages of the crop to the farmer are discussed.
640. Bush, Guy. Soybean mills for Iowa. Wallaces' Farmer 55(14): 687. Apr. 5, 1930. 6 W15
The writer describes the operation of the soybean mill at Centerville, Iowa, which turns out oil and cake.
641. Busy soybean processor. Grain & Feed Jours. Consolidated 79(1): 29. July 14, 1937. 298.8 G762
An account of the operation of the soybean processing plant of Ralph Wells & Co., Monmouth, Ill.
642. Casberg, Carl H., and Schubert, Carl E. An investigation of the suitability of soy bean oil for core oil. Ill. Engin. Expt. Sta. Bull. 235, 22pp. Urbana, 1931.
"Since some core oil manufacturers have used soy bean oil as a diluent for core oils, it has been suggested that an investigation should be undertaken in order to determine the suitability of soy bean oil either as a substitute for, or a diluent of, other oils used for the purpose of making cores. In response to these suggestions tests were conducted on various soy bean oils, each oil being designated by a letter, to serve as identification in this report."
643. Cole, L. J., Lindstrom, E. W., and Woodworth, C. M. Selection for quality of oil in soy beans. U. S. Dept. Agr. Jour. Agr. Research 35(1): 75-95. Washington, D. C., July 1, 1927. 1 Ag84J
"Paper No. 71 from the department of genetics, agricultural experiment station, University of Wisconsin..."
"Literature cited", pp. 94-95.
It is said that soybean oil has in the last few years become an important factor in the paint industry, since it is much cheaper to use than linseed oil. Its drying quality is, however, lower than that of linseed oil, and breeding experiments have been made in an effort to increase the drying quality of soybean oil. This paper gives the results of these tests.
644. Conant, L. C. Soy bean oil. A new cash crop for Vermont. Bur. Farmer (Vt. Farm Bur. News) 11(2): a-b. Novmeber 1935. 280.82 B89
"In short, if we are to keep in step with the rest of the world, we must look about for improvement in our present crops and for new ones which may supplement the inevitable and, at present, all-important milk check." The writer discusses the possibilities of the soybean in solving these two problems, and the project to test the theory being carried out by a group of men in cooperation with the state Farm Bureau, the Extension Service and Experiment Station.

645. Cox, C. H. Report of soy bean analysis committee. Oil & Soap 14(8): 213-214. August 1937. 307.8 J82
"The work of the Soy Bean Analysis Committee [of the American Oil Chemists' Society] this year has been confined to the further study of the method presented at the New Orleans meeting last year."
646. Cox, C. H. Soy bean analysis. Oil & Soap 13(7): 167-168. July 1936. 307.8 J82
"A paper presented at the Spring Meeting, A.O.C.S., New Orleans, May 28 and 29, 1936."
Methods followed in the analysis of soybeans for oil mill purposes. It is said that "the procedure for cottonseed must be considerably changed for the analysis of soy beans."
647. Crandell, John S. Possibilities of the stabilization of earth roads with soy bean oil. Ill. Engin. Expt. Sta. Circ. 30, pp. 54-55. Urbana, 1937. (University of Illinois Bulletin, vol. 34, no. 76. May 21, 1937) 290.9 I162 no. 30
Papers presented at the Twenty-fourth Annual Conference on Highway Engineering, held at the University of Illinois, March 3-5, 1937.
"In 1936 a thesis on the stabilization of earth roads was written by Fu Hua Chen, a Chinese graduate student, at the University of Illinois...
"The thesis is available at the University of Illinois library, and therefore the tests run, their significance, and their outcome will not be reported here. It is sufficient to say that the results, judging from a laboratory standard, indicated clearly that soy bean oil will bind the soil particles together, will waterproof the surface of a soil road, and will resist freezing and thawing tests as well as asphalts and tars..."
648. D., R. Die verseifbarkeit des soja-phosphatids. Seifensieder-Zeitung 64(42): 802-803. Oct. 20, 1937. 307.8 Se4
Chemical methods to be followed in the saponification of soybean phosphatides.
649. Dacy, George H. New products from soy beans. The crop yields valuable meal and oil. Country Gent. 81(23): 1145. June 3, 1916. 6 C833
"The successful production of soy-bean meal and oil on a commercial scale is notable in that it places on the market a mill feed containing twenty to twenty-five per cent more protein than does cottonseed meal; it affords the soy-bean raisers a new and profitable market outlet for their grain; it provides an oil that is suitable for practically all the purposes for which cottonseed oil is used and that can be sold at a lower price, while it will boom the bean business so that a larger acreage of the soil-improving soys will be raised each year."
Harvesting methods are also discussed.

650. Davidsohn, J. Die bleichung der oele mit bleicherden. Masloboino-Zhirovoe Delo no. 7-8(12-13), pp. 10-17. July-August 1926. Libr. Cong. TPl.M3
Text in Russian with alternate title in German.
Bleaching of oils with fuller's earth. The experiments were carried out with soybean oil.
Abstract by C. C. D. in Chem. Abs. 22(17): 3310. Sept. 10, 1928.
651. Ditmar, Rudolf. Die bedeutung des sojabohnenöls als dehnungserhöher und als plastikator für die herstellung von kaltvulkanisaten. Gummi-zeitung 41(10): 535-536. Dec. 3, 1926. 305.8 G95
The writer takes up the importance of soybean oil as an agent for increasing the elongation and as a plasticizing agent in the production of cold-vulcanized rubber.
652. Earle, F. R., and Milner, R. T. The occurrence of phosphorus in soybeans. Oil & Soap 15(2): 41-42. February 1938. 307.8 J82
Bibliography, p. 42.
"The phosphorous compounds present in soybeans have been tentatively divided into four groups. Methods for determining these groups have been studied and applied to the analysis of a sample of soybeans." - Abstract, p. 41.
653. Eastman, Whitney H. Domestic soybean oil now appreciated. Grain & Feed Jours. Consolidated 69(11): 527. Dec. 14, 1932. 298.8 G762
Abstract of address before National Soybean Oil Manufacturers Association.
Brings out the prejudice formerly existing against domestic soybean oil, and its lessening through the efforts of the National Soybean Oil Manufacturers Association, which set up trading rules and quality standards.
654. Eastman, Whitney H. Soybean oil and meal in industry. Oil, Paint and Drug Reporter 122(11): 17, 34. Sept. 12, 1932. 306.8 O15
Address before the annual convention of the American Soybean Association, Washington, September 2, 1932.
"The two main products of the soybean oil mills are soybean oil meal, a vegetable protein concentrate, and soybean oil, a semi-drying vegetable oil, and I shall confine my remarks to them, more particularly with respect to their production, distribution, and industrial utilization."
Extracts under title "Development of the Soybean Oil Meal Industry." Grain & Feed Jours. Consolidated 69(5): 231. Sept. 14, 1932. 298.8 G762
Also published under the title "Industrial Utilization of Soybean Oil and Soybean Oil Meal" in Paint, Oil, and Chem. Rev. 94(5): 12-13, 19. Sept. 8, 1932. 306.8 P16

655. Eastman, Whitney H. Utilization of soybean oil meal. Grain & Feed Jours. Consolidated 69(10): 478. Nov. 23, 1932. 298.8 G762

From a speech before the National Soybean Oil Manufacturers Association.

Outlines the processes used for extraction; the soft pork danger and the perfection of a process by the Trade Association to produce an oil meal with a maximum of 6% oil; and the industrial uses for the oil meal.

656. Eastman, Whitney H. The utilization of the soybean in the oil milling industry. Amer. Paint Jour. 15(46): 56, 58, 60, 62. Aug. 31, 1931. Bur. of Standards.

"An address given before the recent annual convention of the American Soybean Association at Columbia, Mo. - Editor."

"I have shown the scope of the soybean milling industry at the present time, particularly in relation to the continued development of the soybean crop. I have demonstrated that the milling industry is important to the production of soybeans on a large scale, and that a greater and more widespread demand for soybean products is necessary to provide a continued outlet for a large share of the crop. And I have emphasized particularly the importance of a greater consumption of soybean oil meal in order to provide an outlet for the product representing the greatest value of the milling beans."

657. Eddy, C. O. Soybean oil meal emulsifies mineral oils. Ky. State Hort. Soc. Trans., 1933, pp. 139-141. Henderson, Ky. [1933?] 81 K41

"Contribution from the Department of Entomology and Botany of Kentucky Experiment Station..." - Note.

"During the dormant season of 1932-33 laboratory work indicated the possible value of soybean oil meal as an emulsifier for mineral oils for dormant spray purposes. These experiments indicated that an additional saving of 10% could be made on tank-mixed emulsions which now cost in Kentucky about 72c for 200 gallons of 2% finished oil emulsion..."

658. Eisenschiml, Otto. Domestic soya bean oil, its history and its prospects. Paint, Oil and Chem. Rev. 87(12): 12-14, 16. March 21, 1929. 306.8 P16

"A paper read before the March meeting of the Northwestern Paint Superintendents' Club, Minneapolis." - Ed. Note.

"150,000 to 200,000 gallons of domestic Soya Bean Oil per month will have to be sold, at times, in 1929 says the author who predicts a game of tag between the producer and consumer as to who works faster. Sometimes the market will be congested, other times it will be lean and altogether it will remain a thin market for some time to come. A thin market he states always is loaded with sudden and interesting possibilities." - Ed. Note.

Also published under title "Domestic Soya Bean Oil" in Oil & Fat Indus. 6(4): 15-19. April 1929. 307.8 J82; and under title "History and Prospects of Domestic Soya Bean Oil" in Amer. Paint Jour. 13(22): 22, 24, 26, 28, 30. March 18, 1929. Bur. of Standards.

659. Eisenschiml, Otto. Soy beans in industry. Grain Dealers Jour. 64(3): 203. Feb. 12, 1930. 298.8 G76
Abstract of address "before University of Illinois farmers week meeting."
The industrial uses for soybean oil are discussed, and concentrated propaganda for the purpose of making the oil known is suggested.
660. Ellison, R. W. Determining the color of soya bean oil. Cotton Oil Press 4(6): 49-50. October 1920. 307.8 C8234
"In the absence of a standard instrument for accomplishing this purpose, we wish to outline a very simple method for use with any instrument of the type of the Greiner-Wesson-Peep tintometer, which gives very satisfactory results..."
661. Fellers, Carl R. Soy-bean oil: factors which influence its production and composition. Jour. Indus. and Engin. Chem. 13(8): 689-691. August 1921. 381 J825
The chemical characteristics of soybean oil, the oil and protein content of various soybean varieties, and the effect of date of planting upon the composition and maturity of the beans are studied.
662. Flint, W. P., Chandler, S. C., McGovran, E. R., and Farrar, M. D. Progress in control of codling moth in 1934. Ill. State Hort. Soc. Trans. (1934)68: 153-176. [Springfield, 1935] 81 I16
This is in the form of a discussion. Soybean oil in combination with lead arsenate and lime, is one of the products tested for use. (pp. 159-162)
663. Fryer, Percival J., and Weston, Frank E. Technical handbook of oils, fats and waxes. Ed. 3, 2v. Cambridge, Eng., University press, 1920. (Cambridge Technical series.) 307 F94
v. 1, pp. 121-122, Soya Bean Oil. Gives physical and chemical data, method of obtaining the oil, method of refining it, and its properties and uses.
664. Gardner, Henry A. Committee work on hexabronide test for determining purity of soya bean oil or linseed oil, Steele or Bailey method. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 83, 11pp. [n.p.] January 1930. 306.9 P162C
"National Varnish Manufacturers Association (Co-operating)."
These are the instructions sent to members of Sub-committee III of the American Society for Testing Materials who are to cooperate

on the Hexabromide test. Included are the following two papers for making the test: A New Hexabromide test for linseed oil, by L. L. Steele and F. M. Washburn, pp. 2-6; and Bailey's proposed method, pp. 6-11. These methods are applicable to soybean oil.

665. Gardner, Henry A. Driers for soya oil. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 69, 12pp. [n.p.] August, 1919. 306.9 P162C

Abstract by A. de W. in Soc. Chem. Indus. Jour. 38(21): 833A. Nov. 15, 1919. 382 M31

"The writer has received many requests for information as to the most efficient driers for soya oil. The results of a laboratory investigation that has just been completed, justify, in so far as these tests are concerned, the conclusions given below. It is believed that similar results with soya oil may be obtained by paint manufacturers who are skilled in the treatment of oils."

666. Gardner, Henry A. Examination of commercial American soya bean oil. Inst. Paint and Varnish Research., Ed. Bur. Sci. Sec. Proc. (1923): 117-118. 306.9 P162P

National Varnish Manufacturers' Association cooperating.

Reprint of Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 165.

The author lists the mills that are now (1923) crushing soybean oil and gives an analysis of two samples of soybean oil.

667. Gardner, Henry A. Legitimization of soya bean oil. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 63, [2]pp. [n.p.] June 1919. 306.9 P162C

"Soya oil has a higher flash point than any other vegetable oil used in the paint industry. It may be heat treated and blown to a viscous form. Its value in varnish making has already been indicated, and it is probable that it will soon be established firmly in the industry. Its further use is suggested."

Also published in Sci. Amer. 121(8): 196. Aug. 23, 1919.

470 Sci25; in Drugs, Oils and Paints 35(2): 48-49. July 1919.

306.8 D; and under title "A Substitute for Linseed Oil in Paint Manufacture. Legitimization of Soya Bean Oil" in Amer. Architect 116(2271): 29. July 2, 1919. 296.8 Am32

668. Gardner, Henry A. Papers on paint and varnish and the materials used in their manufacture. 501pp. Washington, D. C., 1920. Libr. Cong. TP935.G3

"In the present work the author brings up to date the series of technical papers which he has prepared as circulars of the Educational Bureau of the Paint and Varnish Manufacturers Association of the United States, since January, 1919, covering his researches in the technology of paint and varnish..." - Preface.

Ch. I, Resume of soya bean oil investigations, pp. 9-28. Contains material reprinted from Circ. 50 "Soya Oil in Paints"; Circ. 63 "Legitimization of Soya Bean Oil"; Soya Bean Oil in Paste Colors, an article presented by the writer before the Pennsylvania State Association of Master Painters, Jan. 15, 1920; Circ. 60 "Changes in Oil Upon Storage"; extracts from address by L. P. Nenzek before the Mississippi Cottonseed Crushers' Association at New Orleans, as reprinted in Circ. 37.

Ch. II, Driers for soya bean oil, pp. 29-41. Gives the results of laboratory investigations on the most efficient driers for soybean oil.

Ch. V, Changes in oils upon storage, pp. 60-70. Includes, Table 27, p. 64, results with soybean oil in 1911-1919 oil tests.

Ch. VIII, Hexabronide test for determining purity of linseed oil, pp. 96-110. Describes method of determining the purity of raw soybean oil and raw linseed oil by the Steele and Washburn method and Bailey's modification of it, as forwarded to Subcommittee III on the Testing of Paint Vehicles.

Ch. XI, Fume loss in boiling oils, pp. 138-140. Table 45, p. 140, shows the specific gravity of soybean oil, the percentage weight loss and the percentage volume loss in processing.

669. Gardner, Henry A. Physical and chemical examination of paints, varnishes, lacquers and colors. Ed. 7, 1178, A1201-A1448pp. Washington, D. C., Institute of Paint and Varnish Research, 1935. 306 G17Ph Ed.7

Brief mention is made of trading rules established by the Soybean Oil Manfrs. Assoc., pp. 720-721; use of soybean oil, p. 723; and the detection of soybean oil, p. 774.

The Oil Index Supplement contains, pp. A1380-A1381, a list of commercial soybean oils with the names of the producers, and certain information about the oils supplied by the producers themselves.

670. Gardner, Henry A. The practical testing of drying and semi-drying paint oils. Amer. Soc. for Testing Materials Proc., 11: 641-649. [n.p.], 1911. 290.9 An34

Proceedings of the Fourteenth annual meeting held at Atlantic City, New Jersey, June 27-July 1, 1911.

Describes the method of conducting the paint tests at Washington, D. C., which were conducted by the Institute of Industrial Research, at the request of the Paint Manufacturers' Association of the United States. Soybean oil was one of the vehicles used.

671. Gardner, Henry A. Repainting tests on paint oils. With notes on the changes occurring in oils upon ageing. Paint Manfrs. Assoc. U. S., Ed. Bur., Bull. 46, pp. 112-121. Philadelphia, Pa. [cop. 1914.] 306.9 P162

Reprint of Circular 30 of the Scientific Section.

Gives the conclusions obtained in paint tests at Washington, D. C., in May 1911. Soybean oil paint was included.

672. Gardner, Henry A. Research in the paint industry. Sci. Amer. 122(4): 89. Jan. 24, 1920. 470 Sci25
The tests made in substituting soybean oil for linseed oil are described, and it is concluded that "soya oil is a highly desirable paint oil when intelligently handled by the paint manufacturers."
673. Halliday, G. E., and Kraybill, H. R. Method for measuring color of soybean oil. Oil and Soap 12(2): 22-24. February 1935. 307.8 J82
"A paper presented at the eighth fall meeting of the American Oil Chemists' Society in Chicago, October 11, 1934."
"Part of these data are from a thesis submitted by G. E. Halliday to the Faculty of the Graduate School of Purdue University in partial fulfillment of the requirements for the degree of Master of Science, August, 1934."
Literature cited, p. 24.
"On the basis of these data [which have been outlined] a colorimetric method of determining the color number of soybean oil was devised which is simple, rapid and accurate..."
674. Hauge, S. M., Wilbur, J. W., and Hilton, J. H. An attempt to remove the vitamin A suppressing factor in soybean oil by adsorbents. Jour. Dairy Sci. 20(7): 429. July 1937. 44.8 J822
Abstract of paper presented at annual meeting of the American Dairy Science Association.
"The results of this preliminary trial would indicate that activated carbon removed a good portion of the vitamin A suppressing factor in soybean oil, while the other adsorbent [synthetic sodium aluminum silicate] was without effect."
675. Heberer, A. J. Some uses of soybean oil in paints and varnishes. Oil & Soap 14(1): 15-16. January 1937. 307.8 J82
"A paper presented at the Fall Meeting of the A.O.C.S. [American Oil Chemists' Society], Chicago, October 8-9, 1936."
"Soya oil has been used in the paint industry for about 40 years and one can readily foresee that although Soya oil is not a substitute for linseed it has certain properties which make it necessary to the paint industry, and who knows but that with 3000 years' experience and development Soya oil may supersede linseed in the paint and varnish industry."
676. Heckel, G. B. Fire hazard of the newer "drying" oils. Natl. Fire Protection Assoc. Quart. 12(3): 283-284. January 1919. 296.68 N212
Soy, perilla, tung, fish or menhaden oils are "as to their status as 'risks', on the same footing as linseed oil."
677. Heller, Hans. Soybean oil. Farbe und Lack 1937, pp. 161-162, 175.
Not examined.
"This discussion of soybean oil is devoted mainly to correcting several widely accepted inaccuracies relating to its production,

properties and uses. Refined soybean oil is, when blown, especially suitable for printing ink and with Beckacites yields excellent baking enamels." - Chem. Abs. 31(20): 7673. Oct. 20, 1937.

678. Hirose, Masawa, and Shimomura, Tsuneo. Study on polymerised soja bean oil and its soap. Soc. Chem. Indus. Japan Jour. 33(5): 169B-172B. May 1930. J385 J82
This is an English abstract in the Supplementary binding of an original article in Japanese in the main binding.
"As will be seen from these experiments polymerisation gives somewhat bad influence on the detergent power, but the appearance and the quality of the soap do not grow worse during preservation by the action of air. Moreover, polymerisation increases remarkably the tenacity of soap..."
679. Horvath, A. A. Adhesives from soya protein. Indus. and Engin. Chem., News Ed. 14(24): 500. Dec. 20, 1936. 381 J825
Methods for extracting soybean oil from the beans by means of benzine and the extraction of the protein from the meal by alkalies as given in patents 1,275,308 (U. S. 1918) and 1,321,480 (U. S. 1919) by S. Satow. The protein may be used in the manufacture of adhesives.
680. Horvath, A. A. Soybean oil as soap making material. Assoc. Chinese Amer. Engin. Jour. 6(7): 65-72. July 1925. Libr. Cong. TA4.A87
Soybean oil as a substitute for linseed or cottonseed oil in soap making. Methods of making the various soaps from soybean oil and their characteristics are described.
681. Horvath, A. A. Soybean oil for soap making. Soc. Chem. Indus. Jour. (Chem. and Indus.) 55(36): 691-693. Sept. 4, 1936. 382 M31
"Based on experimental work conducted by the author in 1920-21 at the laboratories of the Tientsin Chemical Works Association, Tientsin, China."
Bibliography, p. 693.
"(1) The lathering capacity of soybean oil soap is not much affected by the hardness of the water. (2) The caustic soda lye used in the initial saponification step of soybean oil should not exceed 8.5° Bé. (3) For curd soaps soybean oil should be used only in mixtures with other fats and oils. (4) Soybean oil is very suitable for the manufacture of soft soap. (5) The hydrolysis of soybean oil by Twitchell reagent and the manufacture of soap from the fatty acids are discussed." - Summary, p. 693.
Abstract in "The utilization of soya beans." Chem. Age London 34(880): 417-418. May 9, 1936. 382 C427
682. How soya bean oil has entered the field of major oil crops. Chemicals 34(25): 3-4. Dec. 22, 1930. 306.8 C42
"The sales of a million gallons of soya bean oil during the past two weeks to manufacturers of soap and to edible oil refiners by

one of the largest crushers in this country emphasizes the change that has come about in this industry during the past few years."

683. Iowa. State planning board. An approach to county planning, Appanoose County. 109pp., illus. [Des Moines] Iowa state planning board, 1936. 280.7 Io9A
Soybean products, pp. 29-30. A short statement about a new industry in Centerville - Standard Soybean Mills which, at that time, was operating at only about one-half capacity, because of high prices of beans.
684. Iwasa, Yosaburo. [Utilization of the by-products in the preparation of soybean oil by the alcohol-extraction method.] Agr. Chem. Soc. Japan Jour. 13(3): 225-235. March 1937. J385 Ag8
Text in Japanese.
Abstract by Y. Kihara in Chem. Abs. 31(15): 5607. Aug. 10, 1937. 381 Am33C
685. Kakimoto, Yoshihide. Preparation of reclaimed rubber with soy-bean oil. Osaka Indus. Research Inst. Japan. Repts. 19, No. 9. 1929.
Not examined.
"The method of prepng. reclaimed rubber with soy-bean oil under various conditions was studied. The material was prepd. by vulcanizing F.A.Q. smoked sheet with acid-free S(90:10 ratio) under proper conditions. Reclaimed rubber was prepd. by the usual method, i.e., by mixing the vulcanizate with soy-bean oil. The mixt. of vulcanizate and oil was vulcanized with S(60:30:10 ratio) under various conditions..." - Chem. Abs. 24: 988.
January-April 1930.
686. Keghel, Maurice de. Les "stand olie" et autres huiles préparées dans leurs applications aux peintures émail & peintures vernissées. La Revue des Produits Chimiques 25(18): 613-618; (22): 757-764; (24): 829, 831-838. Sept. 30, Nov. 30, Dec. 31, 1922.
383 R327 folio
This study on prepared oils as used in enamels and varnishes. contains a brief passage on the use of perilla and soybean oil in the paint industry, p. 763. The treatment of soybean oil to render it usable is outlined.
687. Kemner, H. [Perilla oil and soybean oil [in the paint industry].] Farbe und Lack 1937, pp. 595-596.
Not examined.
688. Ladd, Culver. Soya bean investigation. N. Dak. Agr. Expt. Sta., Food Dept., Paint Bull. 1(7): 130-138. October 1919.
"At the request of the Paint Manufacturers Association the chemical department carried on an investigation with soya beans grown by the Paint Manufacturers Association..."

"The object of the investigation was to determine what varieties were best suited to the various growing conditions and to obtain at the same time an oil suitable for use in the paint industry. The need for such an investigation was the demand for a suitable substitute for linseed oil which is becoming scarce with its rapidly increasing use."

Results are given in tabular form.

689. Lahey, W. G. Fish oil and soya bean oil as paint and varnish vehicles. *Drugs, Oils and Paints* 35(5): 183-187. October 1919. Libr. Cong. TPl.D7

Paper read before the Paint and Varnish Production Men's Club of St. Louis.

"I have attempted to give you the results obtained by authorities, and such information as I have picked up in contact with manufacturers to justify the use of fish and soya oils in paint and varnish."

690. Laucks, I. F. Commercial oils, vegetable and animal, with special reference to Oriental oils. 138pp. New York, John Wiley & sons, inc.; London, Chapman & Hall, ltd., 1919. 307 L36

Section on Soya Bean Oil, pp. 42-46, describes the composition of the soybean and the uses of the oil, and quotes the grades for soybean oil suggested by the New York Produce Exchange, April 15, 1918, and the rules for soybean oil formulated by the Interstate Cottonseed Crushers Association.

691. Lewis, A. J., and Markley, K. S. Soybean oil varnishes. *Paint, Oil, and Chem. Rev.* 99(26): 5. Dec. 23, 1937. 306.8 F16

"The examples cited above are typical of the results which have been obtained in the paint and varnish research of the U. S. Regional Soybean Industrial Products Laboratory. The work, much of which is still in progress, indicates clearly that properly-treated soybean oil can be substituted up to 100 per cent of the oil vehicle in a considerable number of varnishes, not only without impairment, but in certain cases with actual improvement of the properties of the resulting films."

692. Long, J. S., Reynolds, J. B., and Napravnik, Joseph. Studies in the drying oils. XVIII. Specific heat and features of heating drying oils. *Indus. and Engin. Chem.* 26(8): 864-868. August 1934. 381 J825

"Presented before the Division of Paint and Varnish Chemistry at the 87th Meeting of the American Chemical Society, St. Petersburg, Fla., March 25 to 30, 1934."

"The specific heats of linseed oil, China wood oil, and soybean oil have been determined over much of the temperature range employed in heating them to make industrial products..." - Note.

693. Mazzetti, Giuseppe. Ulteriori osservazioni sul potere battericida dell'olio di lino cotto e di altri olii vegetali. Società Italiana di Biologia Sperimentale. Bollettino 3(6): 754-758. Nov. 20, 1928. 442.8 Sol2

This is the third in a series of articles on the bactericidal power of boiled linseed oil and other vegetable oils. Very brief results for soybean oil are included in this installment.

694. [Morrison, H. J.] Report of Soya bean oil committee. Cotton Oil Press 4(3): 90-92. July 1920. 307.8 C8234

"At the meeting of the Soya Bean Oil Committee of the Society of Cotton Product Analysts held in the arbitration room of the New York Produce Exchange on December 10, the rules governing transactions in soya bean oil were discussed..." Results of cooperative color readings of two oil samples sent out by the Soya Bean Oil Committee are given in tabular form.

695. Nelson, E. M. Chemical study of the ether extracts of soy bean leaves. Jour. Indus. and Engin. Chem. 12(1): 49-50. January 1920. 381 J825

"Published with the approval of the Director of the Wisconsin Agricultural Experiment Station."

Describes the results of an experiment to determine whether soybean leaves form an available source of oil for paint manufacture.

696. Nemzek, L. P. The production and use of soya bean oil in the United States with a brief history of their development. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec. Circ. 155, 14pp. [n.p.] September 1922. 306.9 P162C

Reprinted in Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec. Proc. 1923: 1-14. "National Varnish Manufacturers' Association (Co-operating)". 306.9 P162P

An address before the Corn Belt Seed Growers' Association, Columbia, Mo., September 1, 1922.

Importance and value of soybean oil, the imports of it into the United States 1913-1921, the tests made to establish its adaptability to paint and varnish making, methods of manufacturing soybean oil, the physical properties of and prices obtained for the oil, price of beans, and the composition of the meal are fully discussed.

Also published under title: Soya bean oil: production and uses. Oil, Paint and Drug Reporter 102(20): 33, 50. Nov. 6, 1922. 306.8 O15

Also under title: Production and use of soya bean oil in U. S. A brief history of its development in the United States. Properties of the oil and its by-products. Paint, Oil and Chem. Rev. 74(9): 10-11; (10): 10-11. Aug. 30-Sept. 6, 1922. 306.8 P16

697. Nemzek, L. P. The soya bean and soya oil. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 37, [8]pp. [n.p.] June 10, 1916. 306.9 P162C
Address presented at meeting of the Mississippi Cotton Seed Crushers' Association, New Orleans, La., May 18, 1916.
The work done by the Educational Bureau of the Paint Manufacturers' Association in the interest of soybean oil is outlined and there are discussed the quality of the oil produced in this country, prices at which soybeans should be purchased for profit in the oil industry, and opportunities for disposing of the oil and meal.
698. A new use for soy beans. Hoard's Dairyman 51(3): 94. Feb. 11, 1916. 44.8 H65
Describes the work of the Elizabeth City, North Carolina oil mill, the quantity of soybeans handled, and the uses to which the meal may be put.
699. North Carolina State college of agriculture and engineering, State College Station, Raleigh. The commercial use of the soybean. N. C. Agr. Col. Ext. Circ. 29, 16pp. Raleigh and West Raleigh, 1916.
This circular is made up of extracts from letters to C. B. Williams of manufacturers using soybean oil. "Observations from extracts of letters," p. 16, has the statement that "it is quite evident that soybean oil has wide usefulness in the manufacture of soap, paint, varnish, enamel, japans, linoleums, oilcloth and other waterproofing materials, asphaltum, salad oils and other human foods, etc."
700. Paint company erects new soy oil plant. Bur. Farmer (Ill. Agr. Sec.) 10(8): 8. April 1935. 280.82 B89
The article describes the growing interest in soybeans, the erection of a new \$650,000 plant for processing soybeans by the Glidden Company in Chicago, and the value of soybean oil in paint.
701. Paint manufacturers' association of the United States, Educational Bureau, Scientific section. Inspection report on Washington paint oil tests and Washington cement paint tests. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec. Bull. 53, 40pp. Philadelphia, February 1917. 306.9 P162
Preface by Henry A. Gardner.
Observations in tabular form on the exposures made at The Institute of Industrial Research, Washington, D. C. Soybean oil paints are included.
702. Pontius, Albert W. Soap from soya beans. U. S. Dept. Com. Bur. Manfr. Daily Cons. and Trade Repts. 15(107): 494. Washington, D. C., May 6, 1912. 157.7 C76D
This is a report on the Manchurian soap industry. A note

appended by the Bureau of Manufactures cites the value of the soybeans imported by American soap factories in 1911.

Also contained in article entitled "Soap from Soya Bean Oil." Oil and Colour Trades Jour. 41(712): 1985. June 8, 1912. 306.8 O152

The latter is given in an abstract in Chemiker Zeitung, Reportorium 37(60-62): 285. May 24, 1913. 384 C427.

703. Price, David J., and Brown, Hylton R. Glidden soybean plant explosion. Natl. Fire Protection Assoc. Quart. 29(3): 233-240. January 1936. 296.68 N212

A study of the cause of the explosion of the soybean processing plant of the Glidden Company in Chicago. The conclusions from the investigation and recommendations are given.

This report has been adapted in an article by the authors under the title "Explosions Reveal Hazards of Soybean Processing" in Natl. Safety News 33(3): 19-21. March 1936. 449.8 N212

704. Price, David J. A rural soybean plant explosion. Natl. Fire Protection Assoc. Quart. 29(3): 240-243. January 1936. 296.68 N212

A report on the explosion of a soybean extraction plant at Momence, Illinois. Recommendations are made.

Report adapted in Natl. Safety News 33(3): 21, 68. March 1936. 449.8 N212

705. [Price, David J.] Soy bean explosion hazards. Safety Engin. 75(3): 20. March 1938. 449.8 Sal

"Safety measures and devices for reducing the danger of explosions should be included in plans for building soy bean oil-extracting plants. Vapors produced in using hexane and similar flammable solvents in extracting oil from soy beans may be easily ignited and cause disastrous explosions according to Dr. D. J. Price, of the U. S. Dept. of Agriculture."

706. The production and industrial employment of vegetable oils. Engineer 123(3189): 123-124; (3190): 147-148; (3191): 169-172; (3192): 192-194; (3193): 213-215; (3194): 240-242; (3195): 261-263; (3197): 307-308; (3199): 349-352; (3201): 395-399; (3202): 417-418; (3203): 439-440; (3204): 462-463; (3205): 486-488; (3206): 511-514; (3207): 546-548; (3208): 559-561; (3209): 581-584. Feb. 9-March 23, April 6, April 20, May 4-June 29, 1917. Libr. Cong. TAL.E5

Describes the production of vegetable oils from a mechanical point of view with much detail on processes of extraction and refining of oils. The second installment, which lists the principal vegetable oils and summarizes their sources, characteristics and chief uses, includes soybean oil. Numerous illustrations and diagrams are given for the machinery and processes used.

707. Regional soybean products laboratory reports on varnish exposure tests. Amer. Paint Jour. 22: 7-8. Jan. 3, 1938.
Not examined.
"...It has been found that soybean oil can be substituted up to 100% for the oil constituent in many varnishes without impairing them. A soybean oil varnish subjected to 7 months weathering is still in good condition, shows little luster loss and no checking, peeling or cracking." - Chem. Abs. 32(5): 1951. Mar. 10, 1938.
708. Roquemore, Everett E. Soybean oil meal rating as a protein supplement. Grain & Feed Jours. Consolidated 68(9): 464-465. May 11, 1932. 298.8 G762.
Methods of extracting soybean oil, chemical analysis of the oil meal, the use of the meal in animal feeding, and results in its use by various experiment stations, and soybean production and demand in the United States, are considered.
709. Sefing, F. G., and Surls, M. F. The use of soy bean oil as a core binder. Mich. Engin. Expt. Sta. Bull. 54, 12pp. East Lansing, 1933. 290.9 M583
Bibliography, p. 10.
"Soy bean oil was suggested for investigation as a cheap oil which might be used to advantage by the foundry and at the same time provide an outlet for the oil which is a by-product of the soy bean cake industry. The investigation was, therefore, undertaken for the purpose of determining the suitability of raw bean oil as a core binder for foundry work."
710. Shino, Kotaro, and Harada, Taro. Fermentation of soybean meal. Soc. Chem. Indus. Japan Jour. 32(2): 125-130. February 1929. J385 J82
Article in Japanese.
Abstract in English and English title in supplementary binding, pp. 40B-42B.
A study of the constituents of soybean meal before and after fermentation. It has been found more profitable to ferment the meal when used as fertilizer for certain plants.
711. Smith, R. L., and Kraybill, H. R. Soy-bean oil. Quality and yield as affected by conditions of expression. Indus. and Engin. Chem. 25(8): 334-336. March 1933. 381 J825
"Literature cited", p. 336.
The authors list the commercial uses for soybean oil and discuss the effect of moisture content and temperature of pressing on the quality of soybean oil.
712. Solvents a hazard in soybean oil extraction. Natl. Safety News 33(1): 54. January 1936. 449.8 N212
"Measures for reducing the danger of explosion should be included in plans for building soybean oil extracting plants on farms

and in rural communities, says the Bureau of Chemistry and Soils of the U. S. Department of Agriculture. Vapors produced in using hexane and similar flammable solvents used in extracted oil from soybeans may be easily ignited and cause disastrous explosions."

713. Soya bean as linseed oil substitute. Chemicals 34(17): 9-10. Oct. 27, 1930. 306.8 C42

German experiments were found to show unsatisfactory results in the manufacture of varnishes. It is concluded, however, that "certain varieties of the bean, harvested under the right conditions, and milled at the right age in the right manner, will yield an oil quite suitable for varnish manufacture."

714. Soybean as an aid to the paint manufacturer. Illus. World 33: 278-279. April 1920. Libr. Cong. T1.T2
Not seen.

715. Soybean crushing costs. Grain & Feed Jours. Consolidated 79(6): 271. Sept. 22, 1937. 298.8 G762

Soybean crushing cost is said to depend "upon the size of the plant, the cost of the building, the amount of machinery, and the system of oil extraction used."

716. Soy bean industry in Illinois. Chem. Age 30(7): 308. July 1922. 381 C423

"A. E. Staley Mfg. Co., Decatur, Ill., will establish a plant for the extraction of oil from soy beans in conjunction with its starch and glucose plant..."

"The Staley Journal says that the soy bean is a crop which can be grown to advantage on every farm in Illinois."

The demand for soybean oil and the possibilities of substituting it for other products are considered.

717. Soybean oil activities expanded by Staley co. Oil, Paint and Drug Reporter 130(16): 36. Oct. 19, 1936. 306.8 O15

"The A. E. Staley Manufacturing Company, Decatur, Ill., is the largest maker of soybean products in this country, and to A. E. Staley, its head, belongs the credit for the origin, growth and success of the soybean industry in the United States, according to an article published in the Staley Journal, a house organ issued monthly by the A. E. Staley Manufacturing Company." The part played by the company in developing the soybean industry is outlined.

718. Soybean oil standards fixed by association. Oil, Paint and Drug Reporter 118(3): 36. July 21, 1930. 306.8 O15

Lists the standards for the quality and purity of crude domestic raw soybean oil adopted by the National Soybean Oil Manufacturers

Association, as well as the trading rules adopted by it. These latter refer to quality, color, foots, impurities, off quality, quantity, price, terms, time of shipment, shipping directions, routing, weights and samples, rejection, adaptability of goods, contingencies, brokerage, arbitration, freight rates, tankcars, and unloading.

Official chemists are named.

719. Soybean oil varnish stands weather test. Oil, Paint & Drug Reporter 133(1): 3, 41. Jan. 3, 1938. 306.8 Oi5
"A new soybean oil varnish that is standing up well in weather tests was announced today by the Regional Soybean Industrial Products Laboratory of the Department of Agriculture." - [News item dated Washington, Dec. 28, 1937].
720. Soybean products are defined by association. Oil, Paint and Drug Reporter 122(21): 52. Nov. 14, 1932. 306.8 Oi5
"The following definitions have been adopted by the National Soybean Oil Manufacturers Association for by-products of crushing soybeans for the production of oil."
721. Soy beans and soy bean oil. Trop. Life 6(2): 25. February 1910. 26 T752
Chiefly a quotation from an article in the New York Oil, Paint and Drug Reporter as to whether soybean oil can be used for paint. Also in Indian Trade Jour. 17(210): 23. April 7, 1910. Libr. Cong. HF41.I3 (as a reprint from the Oil, Paint and Drug Reporter)
722. Suzuki, K., and Yazaki, A. [Nutritive value of soya-bean cakes.] Agr. Chem. Soc. Japan Jour. 9(2, whole no. 101): 145-151. February 1933. J385 Ag8
"The cake obtained in removing the oil by pressure contains more vitamin-A than that obtained by extraction of the oil with solvents." - Brit. Chem. Abs. (Suppl. to Soc. Chem. Indus. Jour.) B: 936. Nov. 17, 1933. 382 B773
723. Swift & Company's soy bean plant at Champaign. Grain & Feed Jours. Consolidated 79(12): 540-541, 552. Dec. 22, 1937. 289.8 G762
A description of the equipment and operation of the plant, which will produce soybean oil to be used in the making of vegetable oil products, and soybean meal to be sold as livestock feed. Pictures of the plant are included.
724. Thompson, Firman, and Morgan, H. H. Soy bean oil. Del. Agr. Expt. Sta. Bull. 98[i.e.99], 13pp. Newark, 1912.
"Inasmuch as a large part of the United States seems well adapted for the growth of the soy bean, it is the object of this bulletin to inquire into the possibilities of its use as an oil seed in conjunction with its undoubted value as a nitrogen-gatherer for the soil."

725. Thone, Frank. Tung trees in America. Introduced here 30 years ago, rapid-growing trees from the Orient gain root-hold in the South. Sci. News Letter 32(849): 42-44. July 17, 1937.
Contains a statement on pp. 43-44 on the fact that "the tung-oil of the South is expected to form a vital link with the farming-for-industry movement in the North, through another oil plant that also came from China, the soy bean." The soybean's greatest potential market is said to be its use as a paint ingredient. Used alone, soybean oil is a slow drier. The addition of the required proportion of heat-treated tung oil greatly improves "the performance of the paint."
726. Thurston, Azor. Soybean oil. Midland Druggist 52: 202-203. 1918.
Libr. Cong. RS1.M75
Not examined.
"An account of the origin, properties and uses of the oil..." - S. Waldbott in Chem. Abs. 12(14): 1518. July 20, 1918.
727. Toch, Maximilian. Soya-bean oil as a substitute for linseed oil in paints. Engin. News 68(22): 1027-1028. Nov. 28, 1912. 290.8 En34
"From a paper read before the Society of Chemical Industry, New York City, June 7, 1912."
"It is too soon to prognosticate the value of soya-bean oil for exterior painting. But for interior use soya-bean oil is the equal in every respect of linseed oil - particularly when treated with a tungate drier." The low price of soybean oil as compared with linseed oil is cited.
728. Toch, Maximilian. Soya bean oil for paint purposes. Soc. Chem. Indus. Jour. 31(12): 572-574. June 29, 1912. 382 M31
This paper was delivered at the meeting of the New York section of the Society for Chemical Industries at Chemists' Building on Friday, May 24, 1912.
"It is not within the province of the writer to forecast the future of any paint oil, but there is no doubt that if a campaign of education be urged among the farmers, particularly in those states where soil has been regarded as unproductive, and the proper selected seeds of soya beans are planted, no scarcity in the flax-seed crop will ever again be a menace to the paint and varnish industries. At the time of writing linseed oil is quoted at 75 cents per gallon and soya bean oil at 55 cents per gallon. As soon as thousands of acres shall have been planted with soya beans, the proper machinery installed, and the sale for the cake and the silage arranged, soya bean oil will sell at from 25 to 35 cents per gallon, and after the ground has been productive of soya beans for some time, it will be fit for the growing of even the most difficult crops."
A discussion follows the paper.

729. Torri, A. J. Can country elevators process soybeans? Grain & Feed Jours. Consolidated 78(5): 190. March 10, 1937. 298.8 G762
The author describes the three systems in use in this country for processing soybeans, costs of processing, and the problems which arise in the business.
730. Trevithick, H. P. Soya bean oil refining committee of the American Oil Chemists Society, report. Cotton Oil Press 5(1): 53-54. May 1921. 307.8 C8234
"Below will be found a table showing some readings by Dr. Wesson of the Southern Cotton Oil Co., and Mr. Cluff of the American Cotton Oil Co. on soya bean oils where readings were made by daylight and by use of the daylight lamp, Dr. Wesson using the Hess-Ives lamp and Mr. Cluff the Macbeth lamp."
731. Tucker, Mary E. Analysis of soya bean oil for refining loss. Cotton Oil Press 3(6): 41. October 1919. 307.8 C8234
Laboratory practice and findings in refining soybean oil at Falkenburg & Co., Seattle, Washington.
732. U. S. National recovery administration. Proposed code of fair competition for the soybean products processing industry; as revised for a public hearing on December 6, 1934 (Hearing no. 686). 13pp. Washington, U. S. Govt. print. off., 1934. (Registry no. 146-09)
"Submitted by National Soybean Oil Mfg's Association."
The code specifies the purposes of the code; meanings of various terms in the industry; hours; wages; general labor and other provisions; organization, powers and duties of the Code Authority; price practices; trade practice rules; export trade provisions, and provisions for amendments, monopolies, price increases, licenses and marketing agreements, and effective date.
733. U. S. Tariff commission. Production and transportation costs of certain oils. Letter from the Chairman of the United States Tariff Commission transmitting in response to Senate Resolution No. 323 (Seventy-first Congress), certain information relative to the costs of production and transportation to the principal consuming markets of the United States of certain oils and the principal uses thereof. 240pp. Washington, U. S. Govt. print. off., 1932. (Report no. 41, 2d ser.) 173 T17Rs
Cover title: Report to the Congress on certain vegetable oils, whale oil, and copra.
"Interpreting the resolution as outlined, this investigation has been conducted for the purpose of ascertaining the uses of the commodities mentioned and their interchangeability with domestic oils made from domestic materials, so far as such facts may be determined from a study of the technical properties of the oils concerned, their costs, prices, and other economic factors."

Part IV, pp. 119-176, Statistical and Technical Information on Interchangeability of Vegetable and Animal Oils, has the following passages on soybeans: the technical position of soybean oil in soap making, p. 147; soybean oil in the margarine industry, p. 157; soybean oil in the lard-compound industry, p. 163; in the salad oils and dressing industry, p. 166.

Part V, Economic Factors Affecting Interchangeability of Oils - The Question of Replacement, pp. 177-240. This contains sections on price comparisons of soybean, cottonseed and corn oil, pp. 227-228; supply and demand conditions for soybean oil, pp. 231-233; feeding and fertilizing value of cake and meal, and imports of meal (tables), pp. 234-236; and economic factors affecting the interchange of rapeseed oil with domestic corn and soybean oils, pp. 239-240.

The study contains numerous statistical tables, some of which relate to soybeans.

734. Vlachos, William, and Vlachos, C. A. Fire and explosion hazards of commercial oils. 292pp. [Philadelphia] Vlachos & co., 1921.
Libr. Cong. HG9731.05V5
Soy bean oil, pp. 39-40.

735. Ware, E. E. Soybean oil and the paint industry. Indus. and Engin. Chem. 28(8): 903-906. August 1936. 381 J825

"Symposium on the Chemistry and Technology of Soybeans, Presented before the Division of Agricultural and Food Chemistry at the 91st Meeting of the American Chemical Society, Kansas City, Mo., April 13 to 17, 1936."

"Soybean oil is not ideal for paint use because of poor drying qualities, but it does possess the excellent characteristics of permanent elasticity and freedom from discoloration. At present it is seldom used alone; it is either blended with oils of better drying qualities or as a constituent of a synthetic resin vehicle.

"The utilization of soybean oil in paints and varnishes will progress through pressure of popular opinion and as a result of agricultural and industrial research in the improvement of the product." - Abstract, p. 903.

Abstract in "The utilization of soya beans". Chem. Age [London] 34(880): 417-418. May 9, 1936. 382 C427

736. Washburn, W. F. Soya bean oil. N. Dak. Agr. Expt. Sta. Bull. 118, pp. 35-42. Agricultural College, N. D., 1916.

"At the request of the Paint Manufacturers Association this department has determined the moisture and oil content of many samples of soya beans and in addition has determined some of the constants of the oils exprest from the different samples. These samples, representing some forty-five varieties, were grown in a number of states under various climatic conditions and include the crops of 1912, 1913, and 1914."

The results are given in tabular form.

737. Waterproof liquid from bean oil. U. S. Dept. Com. and Labor, Bur. Manfr. Daily Cons. and Trade Repts. 13(104): 448. Washington, D. C., Nov. 3, 1910. 157.7 C76D

This is a paragraph quoted by Vice-Consul A. A. Williamson from the Manchurian Daily News that "an official of the South Manchurian Railway has, by dint of application, invented a new use for soya-bean oil as material for preparing a waterproof liquid which is pronounced by the experts of the Dalny central laboratory of that line to give greater durability at a cheaper cost." It is said that this bean oil now comes into the United States free of duty.

738. Yamada, T. Removal of solid components from fatty oils and drying properties of the residual oils. I. On soya-bean oil. Soc. Chem. Indus. Japan Jour. 37(4): 431-433. April 1934. J385 J82
Article in Japanese.

Alternate title and abstract in English in Supplementary binding, pp. 190B-192B.

"The author has obtained a good drying oil from a soya bean oil, by removing...undesirable components from it." The methods used and results obtained follow.

Farm Uses

739. Albrecht, William A., and Allison, W. H. Changes in composition of soybeans toward maturity as related to their use as green manure. Soil Sci. 32(4): 271-282. October 1931. 56.8 So3
References, p. 282.

"The following study is an attempt to measure by chemical means the differences in organic composition of the tops and roots of the soybean plant, which accompany increasing maturity, in the belief that they may offer suggestions regarding the decomposition behavior of these plant parts in the soil."

740. Arceneaux, George, McKaig, Nelson, Jr., and Stokes, I. E. Studies of soybeans and other green manure crops for sugarcane plantations. Amer. Soc. Agron. Jour. 24(5): 354-363. May 1932. 4 Am34P

"Preliminary field studies on legumes were conducted at the U. S. Dept. of Agriculture's Sugar Plant Field Station near Houma, La., during 1930, for the purpose of comparing the relative green-manuring value of several leguminous plants under conditions more or less typical of the section of Louisiana where sugarcane is extensively cultivated, and determining the most advantageous method of handling the soybean green manure crop under such conditions. The results given represent a single season's work only..."

741. Ayres, W. E. Soybeans: Delta branch station. Miss. Agr. Expt. Sta. Bull. 227, 39pp. A. & M. College, 1925.

Includes, pp. 25-35, discussion of the uses of soybeans for hay, grain, soil improvement, soiling, and silage.

742. Beavers, J. C. Soybeans with corn. Breeder's Gaz. 69(22, whole no. 1801): 1160-1161. June 1, 1916. 49 B74

Increased yields per acre and increased pork production per acre are cited as some of the advantages of planting soybeans with corn.

743. Bermuda. Department of agriculture. Soy beans and cowpeas for soil improvement. Bermuda Dept. Agr. Bull. 7(4): 6-7. April 1928. 8 B45A

Soybeans and cowpeas are recommended for soil improvement and as a labor saver, and the advantages of soybeans over cowpeas are enumerated.

744. Borst, H. L., and Park, J. B. The corn and soybean combination. Ohio Agr. Expt. Sta. Bimonthly Bull. 18(2): 37-42. Wooster, March-April 1933.

"An experiment to determine the value of growing corn and soybeans together was conducted at Columbus from 1919 to 1929, inclusive. After 3 years of preliminary work, the method decided upon was to drill both the corn and the soybeans at the same time and at three rates of planting."

The paper takes up the value of the combination for silage and for grain, and the fertility value of soybeans grown with corn.

The paper is similar in material to the one by the same authors in Ohio. Agr. Expt. Sta. Bull. 513. Wooster, 1932.

745. Borst, H. L., and Park, J. B. Experiments with growing corn and soybeans in combination. Ohio Agr. Expt. Sta. Bull. 513, 26pp. Wooster, 1932.

Bibliography, p. 26.

Three experiments were conducted: 1. A comparison of soybean varieties with corn for silage; 2. Soybeans and corn planted together for silage and grain at different rates; and 3. Corn and soybeans in combination under field conditions. The value of the combination for silage and for grain production is discussed in the conclusion.

746. Briggs, George M. Should we consider soy beans. The crop is profitable where alfalfa and clover cannot be grown. Hoard's Dairyman 61(6): 219, 230-231. Feb. 25, 1921. 44.8 H65

"Make the cost of production less. If soy bean hay will lessen the cost of the feed bill plant soy beans. If soy beans will help your soil so that you can raise something else that will make your feed bill less, plant soy beans. If soy beans in with your corn is profitable as a hogging off proposition, or a lambing off deal, or a cattle filler after silo filling time, or as a silage proposition, plant soy beans..."

747. [Briggs, George M.] Soy bean jazz. Wisconsin joins the boosters of the wonder crop - by "Soy Bean" Briggs. Country Gent. 85(30): 5, 28. July 24, 1920. 6 C833
Importance of the soybean crop in light-soil farming.
748. Brown, H. P. Effect of soybeans on corn yields. La. Agr. Expt. Sta. Bull. 265, 31pp. Baton Rouge, 1935.
"Literature cited", p. 31.
"The object of the research outlined in this bulletin was to get information on the effect of soybeans on corn production in central and southern Louisiana when the two are planted in the same row at the same time; when planted in alternate rows and in the same row; when various rates of bean seeding are used; and on the value of the soybean as a soil renovator when plowed under or taken off for hay."
749. Brown, P. E. Growing soy beans not desirable on land subject to erosion or blowing. Bur. Farmer (Iowa Farm Bur. Messenger) 10(2): 21. October 1934. 280.82 B89
"A study is to be made of this subject at the College in the near future." - Ed. Note.
It has been found that "the crop tends to make the surface soil more open and porous and, therefore, more easily eroded."
750. Brown, P. E. Soy beans not a soil-building crop. Bur. Farmer (Iowa Farm Bur. Messenger) 10(3): 20. November 1934. 280.82 B89
"It may be stated in conclusion that soy beans are a valuable crop in Iowa on land which is not subject to erosion or blowing but they cannot be considered a soil-building crop except when plowed under as a green manure."
751. Burger, A. A. Is the soybean here to stay? Successful Farming 26(4): 18, 53. April 1928. 6 Sul2
The author recounts the results obtained on various farms in soybean growing. Its value to the soil and for feeding is brought out.
752. Burkholder, C. L. Soybean flour. Hoosier Hort. 19(5): 70-71. May 1937. 81 In2H
"In 1936 soybean flour was used as a sticker for lead arsenate in several of the Horticultural Department plots at Lafayette and resulted in an increase in the amount of lead arsenate per pound of fruit immediately following the last cover spray and again at harvest as compared to lime and lead or lime-lead and several other types of stickers..."
753. Burlison, W. L., and Flint, W. P. Fight the chinch-bug with crops. Ill. Agr. Expt. Sta. Circ. 268, 15pp. Urbana, 1923.
"This circular is a revision of Extension Circular 30 published in February, 1919."

The circular gives information on crops upon which chinch-bugs will not feed. Soybeans, pp. 3-8, includes sections on the uses of the beans, and methods of harvesting and threshing them.

754. Burnett, L. C. Soybeans on cornbelt farms. A crop with many uses and how to grow it. *Successful Farming* 21(2): 11, 32, 33. February 1922. 6 Sul2

"In the readjustment of crop acreage which will be made this season on a large number of farms, soybeans will be found of great value. They will help to solve the problem incident to rearranging crops so as to provide for more acres of legumes and fewer acres of corn. While soybeans have demonstrated their right to a place on cornbelt farms under normal conditions, the crop is worthy of more than ordinary consideration under the situation which exists this year."

755. Butler, Eugene. Strong and weak points of soy beans and cowpeas. *Prog. Farmer (Miss. Valley ed.)* 36(17): 468. April 23, 1921. 6 So31

The greater production of grain by soybeans, their use for late planting, and adaptability to clay or loam soils are brought out. The greatest advantage of cowpeas over soybeans is said to be the certainty with which a good stand may be obtained with them.

756. Cardwell, G. A. Why not soybeans? *Farming* 23(1): 8-9. April 1925. 6 F2298

Merits of the soybean in the cropping system, its superiority over the cowpea, varieties for good production, and experiences of several producers with soybeans are brought out. The writer concludes that "there is a place for soybeans on every farm."

757. Cates, J. Sidney. Victory for the soys. The experimental crop of a few years ago has become a staple. *Country Gent.* 84(33): 10, 40-41. Aug. 16, 1919. 6 C833

It is pointed out, among other things, that soybeans are a good poor-land crop, and that they are a good and cheap substitute for expensive manure.

758. Chambliss, Charles E. Soy-bean rotation increases rice yields greatly. *U. S. Dept. Agr. Yearbook*, 1926: 673-675. Washington, D. C., 1927. 1 Ag84Y

"Experiments conducted for a period of 14 years at the rice experiment station, Crowley, La., show that weeds can be controlled and may be eradicated by growing rice in rotation with soy beans."

759. Chinch bugs no longer a "bug-a-boo." *Orange Judd Farmer* 71(9): 267. May 1, 1923. 6 Orl

"Chinch bugs are not the 'bug-a-boo' that they once were to farmers in Macoupin County, Illinois. Even though the trouble still has to be guarded against, the development of interest in

growing soy beans along with corn in that section of the state has lessened their losses considerably in the last two years or so."

760. Churchill, F. G. The soy bean, an annual legume. Iowa Agr. Col. Ext. Bull. 68, 8pp. Ames, 1919.
Soy beans for hay, pp. 6-7, has a table showing yield of seed and hay of certain varieties of soybeans and mentions the value of the hay. Soy beans for seed, pp. 7-8, mentions yield and prices of seed. A brief paragraph, p. 8, points out the importance of the crop for soil improvement.
761. Clark, Charles W. Food, feed and cotton. Country Gent. 93(2): 109. February 1928. 6 C833
The place of soybean growing in the Cotton Belt, as a step in bringing about diversified farming.
762. Class, Charles F. Soy beans as a farm crop. Hoard's Dairyman 53(19): 789, 808. June 1, 1917. 44.8 H65
The writer suggests profitable uses on the farm for soybeans, and methods of harvesting, grinding and feeding them.
763. Cobb, C. W. A soy-bean enthusiast. Natl. Stockman and Farmer 45(3): 84-85. April 16, 1921. 6 N21
The results obtained in planting soybeans on thin land and their feed value are brought out.
764. Colter, C. E. Soybeans win favor on farm. Purdue Agr. 25(9): 183, 196. June 1931. 6 P97
"The soybean has many advantages which account for this rapid rise in favor. It can be used to improve almost any soil because of its adaptability to a wide range of soil types. Of all the grains the soybean produces the richest protein seed and the richest nitrogenous roughage, both of which are very palatable to all kinds of livestock. Its value as a catch crop is high. It ranks well as a cash crop and fits nicely into the rotation."
765. Deal, T. M. As we farm in Iowa. Natl. Stockman and Farmer 44(10): 325. June 5, 1920. 6 N21
The writer disagrees with the statement made by L. W. Lighty in his letter entitled "Soy Beans in the Corn for Silage" in this magazine for May 15, 1920, p. 239. Mr. Lighty felt that planting soybeans in corn is only good in theory. The present writer sets forth the advantages of the practice.
766. Deatricks, E. P. Reduction of soil nitrates during the growth of soybeans. Amer. Soc. Agron. Jour. 20(9): 947-958. September 1928. 4 Am34P
"Contribution from the Department of Soils, West Virginia Agricultural Experiment Station, Morgantown, W. Va. Approved as Scientific Paper No. 59..."

Literature cited, p. 958.

"Experiments with potted soils are described and data are given to show that the nitrates under maturing soybeans are very low..." - Summary, p. 957.

767. Dodd, D. R., and Pohlman, G. G. Some factors affecting the influence of soybeans, oats, and other crops on the succeeding crop. W. Va. Agr. Expt. Sta. Bull. 265, 23pp. Morgantown, 1935.

Literature cited, pp. 20-21.

"Since soybeans more commonly take the place of oats in the rotation, three experiments were conducted to compare the effects of these two crops on the soil following their removal and on the yield of the succeeding crop."

768. Drake, J. A. Management of sandy-land farms in northern Indiana and southern Michigan. U. S. Dept. Agr. Farmers' Bull. 716, 29pp. Washington, D. C., June 9, 1916. 1 Ag84F

It is stated that "the growing of soy beans and cowpeas for seed offers a definite approach to the entire problem of farm improvement in these sandy-land areas of the section." It is given as the first step in producing a well-balanced farm system from these lands.

769. Duley, F. L. Soil erosion of soybean land. Amer. Soc. Agron. Jour. 17(12): 800-803. December 1925. 4 Am34P

"If soybeans are to be a real soil building crop from the standpoint of nitrogen maintenance, they must not only replace, by means of their nitrogen-gathering power, the nitrogen removed from the land by the crop, but also the nitrogen lost in the eroded soil. During the last two years this loss of soil has been measured in connection with a soil erosion project at the Missouri experiment station. The work is being continued and this paper is presented as a progress report." - p. 800.

"The earlier results of this work were published by F. L. Duley and M. F. Miller in Mo. Agr. Expt. Sta. Research Bull. 63. 1923." - Note.

770. Etheridge, W. C., and Helm, C. A. Corn and soybeans. Mo. Agr. Expt. Sta. Bull. 220, 23pp. Columbia, 1924:

"In this bulletin the results of seven years of investigation of the corn-soybean combination are reported. The comparative feeding value of corn and soybeans and of corn alone, for fattening hogs, is shown in the summary of a five-year test. Yields of forage for sheep or cattle, produced by soybeans in corn are recorded. The relation of the mixed crop to drought, chinch bugs and soil fertility is discussed..." - Abstract, p. 3.

771. Farver, Warner E. Soy beans no harm to corn. Natl. Stockman and Farmer 42(3): 72. Apr. 13, 1918. 6 N21
The writer finds that planting soybeans in corn did not injure the corn.
772. Finch, F. R. Experience with soybeans. Ohio Farmer 146(3, whole no. 3775): 57. July 17, 1920. 6 Oh3
The writer found it very profitable to have a few acres of soybeans joining his corn, or growing with the corn.
773. Fox, Kirk. Don't overlook the soybeans. Dairy Farmer 21(9): 18. May 1, 1923. 44.8 K56
"Summing up the main reasons then why soybeans are so popular, it can be said that they furnish a cheap, home-grown protein and at the same time are soil builders."
774. Freehoff, W. A. Putting protein into silage. Soy beans make it better. Orange Judd Farmer 68(15): 718, 745. Apr. 10, 1920. 6 Or1
The author notes in part the experience of Mr. C. S. Ristow, who developed his farm from a run-down condition into one of the most profitable in Wisconsin, through a system of legume cropping and livestock farming. Planting and harvesting the crop for hay and seed are also briefly touched upon.
775. Fremery, F. de. Mededeelingen uit de praktijk. No. 1. Soja en katoen als voorvrucht. Mededeelingen van het Deli Proefstation te Medan 7(1): 57-58. July 1912. 109.5 D37
The paper takes up the results of experiments with soybeans and cotton as a preparatory crop for tobacco.
776. Gapen, C. E. Speaking of soybeans. Successful Farming 19(12): 24, 34, 48, 49, 74. December 1920. 6 Sul2
"The soybean showed its value as a feed, a soil improver and as a dependable unit in the rotation before the gates of the fields were thrown open to it. Much of the foundation for the popularity of this Americanized alien has been built by progressive farmers in Illinois and Indiana..." The experience of William E. Riegel of the Charles Meharry farm in Champaign county, Illinois, with the crop is cited.
777. Graber, L. F. A corn and soy bean partnership. Hoard's Dairyman 59(9): 527, 587. March 19, 1920. 44.8 H65
"Many are thinking about the soy bean and a few are trying to forget it. But after all is said and done - after all the successes and failures have been put in the balance, there will be a preponderance of evidence in favor of the soy bean as an 'emergency' crop and as a 'companion' crop."

778. Harper, Woods. It's not too late to plant soys. The South needs them to feed men, animals and the soil. Country Gent. 82(22): 957. June 2, 1917. 6 C833
"Of all the crops susceptible of eleventh-hour planting in the South, none holds out more promise of reward, none more closely fills the order for an emergency crop to meet a food crisis than the soy bean."
779. Holm, C. A. Soybean varieties for seed and for hay. Mo. Agr. Col. Ext. Leaflet 25, 3pp. Columbia, 1928.
Suggests varieties for seed on good land and medium to poor land, and varieties for hay.
780. Helper, George Y. Soy beans have many virtues. Orange Judd Farmer 62(13): 19. Mar. 31, 1917. 6 Orl
The varieties to be used for hay and seed are mentioned, and it is pointed out that by planting soybeans the soil was so improved that clover could be grown where before it was impossible.
781. Hodgson, R. E. Soybeans; their use and culture in southern Minnesota. Minn. Agr. Col. Ext. Div. Spec. Bull. 82, 8pp. University Farm, St. Paul, 1924.
Soybeans as hay, for hogs, and for seed, the feeding of soybean straw, and varieties suited to Minnesota, are among the topics discussed.
782. Huff, S. W. Soy beans with corn. Country Gent. 82(24): 1021. June 16, 1917. 6 C833
The writer describes the methods used by him in growing soybeans in the same row with corn at Wildwood farms, near Richmond, Va. His estimation of the savings caused by the experiment was "at least \$1000 worth of additional leguminous feed without any additional expense of cultivation and with very little additional expense of handling, and with an expenditure of less than fifty dollars for seed."
783. Hughes, H. D., and Wilkins, F. S. Soybeans. Iowa Agr. Expt. Sta. Circ. 84, 15pp. Ames, 1923.
"In Iowa soybeans have more uses than any other legume. They may be grown either alone or in combination with corn. The seed is one-third protein and contains two important vitamins, making it a high grade, home grown supplemental feed for any kind of livestock. The soybean plant is as high in feeding value as alfalfa and may be used in the form of hay, pasture, silage or soilage, or as a protein concentrate...
"The many uses of the crop on Iowa farms, the ease and certainty with which it may be grown and the profits derived from its production account for the fact that the soybean acreage in Iowa is more than doubling each year."

784. Hughes, H. D., and Wilkins, F. S. Soybeans for Iowa. Iowa Agr. Expt. Sta. Bull. 228, pp. 347-405. Ames, 1925.
This bulletin deals chiefly with cultural practices, but has, p. 347, a section on the uses of the soybean in Iowa, where it is said to have more uses than any other legume. Tables on pp. 404-405, compare the yield of soybeans with that of cowpeas and field beans.
785. Ingalls, W. F. Soy beans. 36pp. [Cooperstown, N. Y., The Arthur H. Crist Co., 1912.] 77 In4
Advantages of raising soy beans with corn, pp. 27-31.
786. Jenkins, E. H. Soy beans. Conn. Agr. Expt. Sta. Bull. 179, 13pp. New Haven, 1913.
"This bulletin gives some facts about the crop and the uses which farmers may make of it, in the belief that it has a place among paying crops and should at least be tested carefully in Connecticut." - p. 3.
787. Jordan, George F. Try soy beans for pasture. Va. Dept. Agr. and Immigr. Year Book, 1920: 42-44. Richmond, Davis Botton, Sup't of public printing, 1920. (Bulletin 148)
"In talking of pasture for both sheep and hogs, the writer is not attempting to boost directly either of these lines of farming. What he wants to show is that the soy bean is one of the best crops that can be grown in the sheep raising sections of the western part of the State, and yields very little to other crops in its adaptability to all sections where the hog finds a home...
"In addition, soy beans are nitrogen gatherers. The stock on pasture become harvesters, hay balers and manure spreaders combined, with the soy bean crop marketed on four feet, - and at what has never yet failed, - marketed at a premium of considerable size over the old style method of running these two classes of stock on the usual summer pasture rations."
788. Jordan, Sam. The onward march of soys. Long is the list of this crop's sturdy virtues. Country Gent. 87(26): 5. Aug. 5, 1922. 6 C843
Advantages of growing soybeans in the Corn Belt are brought out.
789. Justice, J. L. Grow soy beans with corn. Orange Judd Farmer 60(20): 2. May 13, 1916. 6 Orl
The author believes it is more advantageous to grow soybeans with the corn for silage or hogging down, rather than separately.
790. Keith, B. W. Soy beans as a soil improver. Rural New Yorker 84(4842): 623. April 11, 1925. 6 R88
"Here is a crop which will improve the productiveness of your soil by adding as much nitrogen per acre as 10 big loads of good

barnyard manure, thus making it possible to grow larger and better crops the following season."

791. Kenyon, E. T. . Soybeans for soil improvement. Ohio Farmer 143(16, whole no. 3710): 631. Apr. 19, 1919. 6 Oh3
"For land upbuilding, ease of handling and as feed I have found nothing as good as the soybean."
792. Kinney, E. J., and Roberts, George. Soybeans. Ky. Agr. Expt. Sta. Bull. 232, pp. 23-57. Lexington, 1921.
Contains sections on the utility of soybeans, pp. 25-26; a comparison of soybeans and cowpeas in the place they fill in the cropping system, pp. 26-28; mixtures of soybeans and other crops for hay production, pp. 55-56; and the use of soybeans for silage, pp. 56-57.
793. Lacey, James. Soy beans to the rescue. Hoard's Dairyman 63(8): 266-267. March 10, 1922. 44.8 H65
Soy beans as a substitute when the clover crop fails and uses for the crop are suggested.
794. Landry, E. S., and Jenkins, J. M. The Biloxi soybean. La. Agr. Col. Ext. Circ. 67 (reprint) [4]pp. Baton Rouge, 1924.
Contains, p. [2], a discussion on the value of the soybean in a rotation with rice, from data obtained from 5-year experiments at the Rice Experiment Station, Crowley, La., and presented at a conference of bankers, canal men, rice growers and representatives of other organizations interested in the development of the rice industry of southwestern Louisiana, held at the Rice Experiment Station, Crowley, La., September 25, 1923. Harvesting methods are briefly mentioned, p. [4].
795. Landry, E. S. Rejuvenating prairie rice soils. Prog. Farmer Miss. Val. Ed. 39(25): 678. June 21, 1924. 6 So81
The Biloxi soybean in rotation is suggested, with data based on a study for a number of years made at the Rice Experiment Station at Crowley, La. Cultural methods are also discussed.
796. The last call for soybeans. Dairy Farmer 20(9): 206-207. May 1, 1922. 44.8 K56
This article is made up of statements by various farmers on their experiences with soybeans. Among the advantages of the crop mentioned are its uses for dairy cows, in combination with corn, for hay, to replace oilmeal, and the ease of threshing it.
797. Laude, H. H., and Zahnley, J. W. Soybeans in Kansas. Kansas Agr. Col. Ext. Circ. 48, 11pp. Manhattan, 1924.
Includes, among other things, the value of soybeans as a crop, harvesting methods, and the use of soybeans in corn for hogging down.

798. Lining for more soy beans. Agr. Lime News Bull. 2(2): 1, 3-4. May 1921. 309.9 N21Ag
The wide soil adaptation of the soybean, the 50 percent increase in yield creditable to lining, the soybean as a soil builder, and its use in replacing a failing clover crop, are described.
799. Littlejohn, C. N. Soys for robber acres. Country Gent. 89(4): 22. Jan. 26, 1924. 6 C833
"A virtual reclamation of thousands upon thousands of acres of low, wet, unsafe lands in the Yazoo-Mississippi Delta is being wrought through the Laredo soy bean, which is further promising practically to solve the farmers' feed problems."
800. Louisiana State university and agricultural and mechanical college, Baton Rouge. Soybeans. La. Agr. Col. Ext. Circ. 157, 7pp. Baton Rouge, 1935.
This paper outlines the reasons for growing soybeans in Louisiana, harvesting for hay, value as a hay crop, and value for soil improvement.
801. Lovvorn, R. L., Kine, P. H., and Stitt, R. E. I. Factors in soybean production; II. Variety recommendations and characteristics. N. C. Agr. Expt. Sta. Agron. Inform. Circ. 102, 6pp., processed. State College Station, Raleigh, 1937.
Part I includes brief paragraphs on harvesting the seed and the use of the bean for soil improvement, pasturage and silage. Part II lists the varieties recommended for special purposes.
802. McC., J. W. Utilization of the soy bean crop. It is valuable for all kinds of stock. Orange Judd Farmer 66(14): 536, 555. Apr. 5, 1919. 6 Or1
The writer brings out the uses of soybean hay, the great financial value of soybeans as seed, the use of soybeans with corn for hogging down, soybeans as an aid to the corn crop, and the use of soys in the silo.
803. Macdonald, A. B. Ninety-day soys. They grow anywhere and will prove a life-saver to the man whose clover fails. Country Gent. 89(17): 4. Apr. 26, 1924. 6 C833
804. Malin, D. F. "Bill" McArthur's soy beans. Soy beans are all important in the cropping system at Ianoka Farm. Wallaces' Farmer 48(35): 1149. Aug. 31, 1923. 6 W15
Harvesting for hay, and the place of the beans in the crop rotation are mentioned.
805. Mark, P. Lewis. Sensible talk about soy beans. Rural New Yorker 82 (4773): 1514. Dec. 15, 1923. 6 R88
The author takes up the value of soybeans as a soil builder, the returns in wheat where soys have been grown, the uses of soys for seed, hay and forage, their limitations as pasture, yield of seed, and comparison with other crops.

806. Mathews, I. J. Corn-soybean combination. Ohio Farmer 143(17, whole no. 3711): 669-670. Apr. 26, 1919. 6 Oh3

These are the results of a questionnaire sent out to forty-four farmers on the corn-soybean combination. Some of the questions related to varieties, injury to corn, and use as food for pigs and stock.

807. Mathews, I. J. Soybean questions. Ohio Farmer 143(20, whole no. 3714): 782. May 17, 1919. 6 Oh3

Questions on suitable varieties of soybeans, and their preference to cowpeas for high sand are included.

808. Mathews, I. J. Soybeans in the rotation. How this valuable crop can be made to fit in. Successful Farming 20(2): 14, 35. February 1923. 6 Sul2

"With the facts set out above before us, it is no idle statement to say that the soybean can, and perforce must, come to occupy an important place in cornbelt rotation systems. They will grow on a soil so acid that clover does not thrive and they will secure the nitrogen from the air and transform it into soil nitrates...

"From the standpoint of the rotation, the most serious objection to soybeans is that as commonly planted, they need cultivating and this comes just at a time when the corn needs the same treatment. This year, a number of farmers have tried different ways to get rid of this cultivating when the corn needed attention."

809. Metzger, J. E., Holmes, M. G., and Bierman, Harlow. Soybeans: production, composition and feeding value. Md. Agr. Expt. Sta. Bull. 277, pp. 73-101. College Park, 1925.

The writers take up the place of soybeans in the crop rotation, the conditions influencing soybean yields, the varieties of soybeans, and soybean hay.

A section entitled "Soybean hay vs. wheat bran and mixed hay in milk production", by H. R. Bierman is included, pp. 89-95.

810. Minns, Edward R. Soy beans as a supplementary silage crop. A popular discussion for New York. N. Y. (Cornell) Agr. Expt. Sta. Bull. 310, pp. 257-274. Ithaca, 1912.

The feeding value of soybeans, their use as nitrogen gatherers, and harvesting methods are included.

811. Miyake, Koji, and Nakamura, Koji. On the effect of calcium oxide and calcium carbonate upon the decomposition of soy-bean cake and herring cake in two different soils. Jour. Biochem. 3(1): 27-54. July 1923. 385 J822

References, pp. 53-54.

Results of experiments at the Institute of Agricultural Chemistry of Hokkaido Imperial University, Sapporo.

812. Morse, William Joseph. The soy bean; a valuable leguminous crop for the north. *Tribune Farmer* 11(553): 1. June 6, 1912. 6 M484
Includes a brief description of soybean harvesting methods and the uses for the crop.
Following this paper, pp. 1-2, is a note on "Soy Beans as a Farm Crop," which is a summary of *Farmers' Bulletin* 372, and one, p. 2, entitled "Soy Beans as Supplemental Silage" which is based on *Bulletin* 310 of the Cornell Agricultural Experiment Station.
813. Morse, William Joseph. The soy bean: its culture and uses. U. S. Dept. Agr. *Farmers' Bull.* 973, 32pp. Washington, D. C., July 1918.
This is superseded by Morse, W. J. *Soy beans: Culture and Varieties.* U. S. Dept. Agr. *Farmers' Bull.* 1520. Washington, D. C. April 1927. It does, however, contain additional material on the uses of soybeans for seed, for hay, for soiling, for pasture, for ensilage, and for soil improvement.
814. Morse, William Joseph. Soybeans for feed and fertility. 5pp., processed. [Washington, D. C., 1928.] 1.9 P691Sb
Address given at the 29th annual meeting of the Association of southern agricultural workers, Memphis, Tenn., Feb. 2, 1928.
"More general recognition by farmers of the value of the hay, pasture, seed, and oil meal undoubtedly will further stimulate the production of soybeans, especially in livestock sections. Reduced cost of production which agronomists are successfully bringing about, will naturally provide cheaper home-grown protein concentrates, and, therefore, more economical production of farm animals."
815. Noll, C. F. Soybeans for Pennsylvania. *Penn. Agr. Expt. Sta. Rept.* 1915: 47-57. Harrisburg, 1916.
The author describes the value and uses of the crop as seed, green feed or hay, green manure, ensilage, for hog pastures and in the rotation. Yields obtained in variety tests 1913-1914 are also given, and soybeans and cowpeas are compared as to their value for forage and seed production.
816. O'Brien, Harry R. A visit to Soyland. Enthusiasts say this wonder crop fills a gap in corn belt rotations. *Country Gent.* 85(44): 11, 30. Oct. 30, 1920. 6 C833
Cites the work of the Fouts brothers, who have built their entire farm management system around the soybean crop.
817. Ostrander, Ward A. A legume crop for soils and stock. Soybeans produce high-protein feed, and increase the productivity of worn land. *Breeders' Gaz.* 83(14, whole no. 2156): 463-464. April 5, 1923. 49 B74
The use of soybeans for feed, harvesting methods, use of the beans with corn for silage, and expected yields are brought out. This article is worded in part as "Soybeans assure legumes for dairy farms" in *Jersey Bull.* and *Dairy World* 42(11): 505, 541, 542, 543. March 14, 1923. 43.8 J48

818. Park, J. B., Willard, C. J., and Borst, H. L. Growing soybeans in corn. Experiments on Ohio State university farm, Columbus. Ohio Agr. Expt. Sta. Monthly Bull. 7(5-6, whole nos. 77-78): 75-78. Wooster, May-June 1922.

This is a preliminary report of experiments conducted for the three-year period 1919-1921. A comparison is made of corn alone, corn drilled with soybeans, and soybeans alone.

819. Park, J. B. The soybean. Ohio Agr. Col. Ext. Bull. v. 15, no. 11, 4pp. Columbus, 1919-1920.

Uses of the crop, effect on corn yields when the two are planted together, harvesting for hay and seed, and threshing methods are briefly outlined.

820. Park, J. B. Varieties of soybeans for Ohio. Ohio Agr. Col. Ext. Serv. Crop Talk 8, 4pp. Columbus, 1924.

The varieties of soybean to plant for various uses are listed.

821. Phelps, C. S. The soy bean as a forage and seed crop. Conn. Agr. Expt. Sta. Bull. 22, 20pp. Storrs, 1901.

The author includes material on the feed value of the crop, yields, and harvesting.

822. Piper, C. V., and Nielsen, H. T. Soy beans. U. S. Dept. Agr. Farmers' Bull. 372, 26pp. Washington, D. C., 1909. 1 Ag84F

The bulletin takes up in part the importance of the soybean in the United States, the varieties of soybeans, their use for hay, for pasturage, in mixtures, for ensilage and for grain, their feeding value for sheep, dairy cows and hogs, and soybean grain as compared with cotton-seed meal.

823. A popular three-purpose legume. The soybean, which produces hay and seed high in protein and adds nitrogen to the soil, is a profitable cooperator. Breeder's Gaz. 81(17, whole no. 2107): 561-562. April 27, 1922. 49 B74

This is a series of articles including those by F. S. Wilkins (who cites soybean seed prices, value of soybeans per acre for feed, and their use as food and for poultry); R. E. Stephenson (who discusses the possibilities of the soybean in the United States, its value as a soil improver, value when grown with corn and ease of harvesting for hay); and B. E. Carmichael (who takes up its use in cattle feeding).

824. Reynolds, William. Soybeans on a stock-farm. Breeder's Gaz. 77(13, whole no. 1,999): 818. March 25, 1920. 49 B74

"Soybeans give a feed as rich in protein as alfalfa and require the least expensive of fertilizers if the soil is sweet and the seed is supplied with the proper bacteria by inoculation. In return for the inoculation in their unselfish way they leave more

than they take: a bountiful supply of high-priced nitrogen stored in the soil for the crop that is to follow. The farmer who gives the soybean a chance for his stock's and his farm's sakes will not be disappointed."

825. Riegel, W. E. Some soy bean suggestions. Veteran Illinois grower describes his methods of raising soy beans. Wallaces' Farmer 47(7): 216. Feb. 17, 1922. 6 W15
There are included brief passages on the place of soybeans in the crop rotation, choice of variety, and time of harvesting.
826. Rusk, E. W. Beans protect corn from chinch bugs. Orange Judd Farmer 70(4): 105, 135. Feb. 15, 1922. 6 Orl
Statements made by various farmers on the benefits of soybeans in controlling chinch bug damage are quoted.
827. Rusk, E. W. Soy beans as grown in Adams. Orange Judd Farmer 64(12): 3, 10. Mar. 23, 1918. 6 Orl
It was found in Adams County, Illinois, that soybeans "are as sure a crop as any field crop we grow. They are not a wonder crop that will make a farmer rich all at once, but we believe we can use them in our regular farming business." Statements of various Adams County farmers on their experiences with soybeans are quoted.
828. Schmitz, Nickolas. Soybeans. Md. Agr. Expt. Sta. Bull. 201, pp. 131-158. College Park, 1917.
Contains sections, pp. 131-136, on the uses of soybeans for hay, as a concentrate for dairy cows, as a concentrate for hogs, for hog pasture, for silage or soiling, and for soil improvement. Tables give analyses of soybeans for oil content, comparison of the soybean seed with some other concentrates commonly fed over the state, and with hay of the legumes commonly grown over the state.
829. Slipher, John A. The soybean and soil improvement. Ohio Agr. Col. Ext. Serv. Timely Soil Topics 71, 4pp. Columbus, 1924.
275.29 Oh32T
The writer studies the benefits of the soybean from the soil standpoint, and the extent to which its mode of utilization modifies its soil improvement value.
830. Smith, C. B. Rotations in the corn belt. U. S. Dept. Agr. Yearbook, 1911: 325-336. Washington, D. C., 1912.
Corn in rotation with cowpeas or soy beans, wheat, and clover, pp. 331-332, brings out the growing importance of soybeans in the corn belt.

831. Smith, William C. Soy beans with corn. Why farmers should grow them for the soil's sake. Country Gent. 84(20): 48, 50. May 17, 1919. 6 C833
"Soy beans, properly inoculated, ought to be sown with every acre of corn grown anywhere in our country, for the one reason alone that they will put back into the soil more nitrogen than the corn crop consumes in its growth, and then the grower has the additional advantage of producing two crops where he grew but one before."
Harvesting methods are also described.
832. Soy beans and cowpeas. Hoosier Hort. 15(9): 143. September 1933. 81 In2H
Considers the possibility that "we have unknowingly pushed a better green manure crop to the rear and possibly into the discard. That discarded green manure crop might be cowpeas." The advantages of cowpeas over soybeans are brought out.
833. Soy beans on the dairy farm. Hoard's Dairyman 71(11): 467, 498-499. April 25, 1926. 44.8 H65
The uses for soybeans on the dairy farm, their feeding value, expected yields per acre, and method of harvesting are among the matters taken up in this paper.
834. Sprague, Howard B. Soybeans for grain. N. J. Agr. 18(1): 2, 4. January-February 1936. 275.28 N46
Among other things, the high feed value of soybean grain, soybeans in cattle rations, and the replacing of corn in the Middle West by soybeans are discussed.
835. Sprague, Howard B. Soybeans for grain. N. J. Agr. Expt. Sta. Circ. 373, 4pp. New Brunswick, 1937.
The writer lists the reasons for the increased interest in soybeans, and discusses methods for growing and harvesting the crop, and the use of the beans in the crop rotation and in feeding rations.
836. Stewart, Robert. Soy beans in the corn belt. A three-use crop that works well in rotation. Country Gent. 82(18): 828. May 5, 1917. 6 C833
An account of the crop rotation of corn, soybeans, wheat and clover, used by W. E. Riegel in Champaign County, Illinois.
837. Stone, William McD. The soybean and its uses. 30pp. [Alliance, Ohio, The Review press, 1913.] Pam. coll. 60.3 St.
Importance of the soybean as a protein feed, and as a cheap source of nitrogen, are discussed.
838. Stone, William McD. Soybeans and corn. 52pp. Alliance, Ohio, The Review press, 1914. 59 St72
The soybean and protein problem, pp. 4-5; Soybeans for hay, pp. 8-9; The soybean and the nitrogen problem, pp. 9-11.

839. Thomasson, R. R. Soybeans to the rescue. Dairy Farmer 21(19): 16-17, 29. Oct. 1, 1923. 44.8 K56
"The crop offers itself as a last chance for the man on the road to a completely wornout soil who has passed the turn in the road where he might have taken on clover in his crop rotation."
840. Trotter, Ide P. Soybeans and winter barley in one-year rotation. Mo. Agr. Col. Ext. Circ. 347, 4pp. Columbia, 1936.
Soybeans as a legume hay for livestock, and the results of this rotation are discussed in part.
841. Turk, Lloyd M. The composition of soybean plants at various growth stages as related to their rate of decomposition and use as green manure. Mo. Agr. Expt. Sta. Research Bull. 173, 40pp. Columbia, 1932.
Bibliography, pp. 38-40.
"The following study is an attempt to measure by chemical means the differences in organic composition of the soybean plant parts, which accompany increasing maturity, and their differences in decomposition behavior in the soil. From this study it is hoped that an explanation can be given for the depressing effect of soybeans on the crop which follows."
842. U. S. Department of agriculture. Soy beans are profitable. Kimball's Dairy Farmer 17(6): 287. March 15, 1919. 44.8 K56
"The soy bean, the most promising and profitable forage and grain crop which has been widely popularized during the last decade, merits a trial on every livestock farm and introduction into the permanent cropping schedule wherever the results indicate the wisdom of such procedure."
843. Van Wyk, N. J. Cowpeas and soybeans as fodder crops. Farming in South Africa 10(115): 44. October 1935. 24 So842
"The advantage attaching to the cultivation of these crops does not consist only in the provision of better feed, for the plants, having deep roots, open up new sources of plant-food in the soil, thereby enriching it in mineral plant-foods and nitrogen as well as improving its physical condition. These plants therefore constitute ideal crops for the establishment of a sound rotation system with maize and teff."
844. Virginia. Department of agriculture and immigration. Comparison of the cowpea and the soy bean. Va. Dept. Agr. and Immigr. Bull. 253, pp. 65-66. Richmond, 1929. 2 V81B
"A comparison of cowpeas and soy beans is not so much a matter of determining which is the best crop as it is a careful consideration of their climatic and soil adaptiveness and the special uses of each on the farm."

845. Walker, Ben H. Checking up the soys. Hoard's Dairyman 67(4): 114. Feb. 8, 1924. 44.8 H65

Describes the variety demonstration conducted by the Jackson County, Iowa, County Farm Bureau in order to determine the best varieties for various purposes.

846. Warner, H. W. Soys for soil fertility. Some experiences of men who have grown them. Successful Farming 21(3): 11, 41. March 1924. 6 S412

"Considering the great extent of soil acidity in the more humid parts of the country, 'acid-soil' legumes are certain to play an important part in our cropping systems... We will all be several years older before this acidity is corrected or even improved. In the meantime the farmer who cannot lime his fields will find the soybean a dependable and effective builder of humus and nitrogen."

847. Wiancko, A. T., Fisher, M. L., and Croner, C. O. Soybeans and cowpeas. Ind. Agr. Expt. Sta. Bull. 172, pp. 421-438. Lafayette, 1914. (Vol. 17)

A brief history of the beans; their uses and value, their place in the rotation, harvesting and threshing are discussed. This is reprinted in Mo. State Bd. Agr. Monthly Bull. 12(5): 8-27. May 1914. 2 M69B

848. Wiancko, A. T., and Mulvey, R. R. Soybeans in Indiana. Ind. Agr. Expt. Sta. Bull. 238(Rev.), 16pp. Lafayette, 1922.

An earlier edition, published in 1920, was written by A. T. Wiancko and C. O. Croner.

"Indiana farmers should make more extensive use of the soybean. Its chief value on the ordinary farm lies in its high feeding quality, as either grain, hay, or green forage, and in its beneficial effect upon the productiveness of the soil for crops which follow in the rotation. The soybean should find a place wherever additional protein feed is required, as it will readily take the place of such high-priced concentrates as tankage and cottonseed meal. On account of its nitrogen-fixing ability, it provides an excellent leguminous substitute whenever clover fails in the rotation. A fair trial of the soybean will easily demonstrate its claim to an important place in Indiana agriculture."

849. Wiggans, R. G. Soybeans in the northeast. Amer. Soc. Agron. Jour. 29(3): 227-235. March 1937. 4 An34P

"Paper No. 216, Department of Plant Breeding, Cornell University, Ithaca, N. Y. Also presented at the annual meeting of the Society held in Washington, D. C., November 18 to 20, 1936..." - Note.

"The object of this paper is to give certain experimental results as evidence upon which to form an opinion in regard to the pos-

sibilities of soybeans in the northeast and in New York State in particular."

The uses of soybeans as forage, for silage, and for grain are considered. It is concluded that "the place of the soybean plant in northeastern agriculture is not entirely clear, but that it shows sufficient promise to justify much more study and investigation within the area and a more thorough exploration of the northern soybean-producing areas of the world for more and better varieties suitable for the conditions under consideration."

850. Wilcox, E. V. Soy beans hobnobbing with corn. Country Gent. 85(21): 9, 33. May 22, 1920. 6 C833
Reasons for the increased use of soybeans in the rotation on Corn-Belt farms are given.
851. Wilkins, F. S., and Hughes, H. D. Effect of sudan grass and of soybeans on the yield of corn. Amer. Soc. Agron. Jour. 26(11): 901-909. November 1934. 4 Am34P
Literature cited, pp. 908-909.
"Contribution from the Farm Crops Subsection, Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 188. Journal Paper No. J181 of the Iowa Agricultural Experiment Station..."
"This paper gives the yields of corn following sudan grass and soybeans as compared with yields following oats as check through a 14-year period at the Iowa Experiment Station..."
852. Wilkins, F. S. Facts about soybeans in corn. Summary of results secured to date by different stations. Wallaces' Farmer 49(17): 661, 665. April 25, 1924. 6 W15
853. Williams, C. G. The soy bean. Ohio. Agr. Expt. Sta. Circ. 78, 8pp. Wooster, 1908.
Uses of the soybean for hay, silage, seed, soiling, pasture and soil improvement, and harvesting the crop are described.
854. Williams, C. G., and Welton, F. A. The soybean and cowpea. Ohio Agr. Expt. Sta. Bull. 237, pp. 241-261. Wooster, 1912.
The authors take up, pp. 241-256, the soybean, including its uses as grain, hay, silage, a soiling crop, pasture and a soil renewer, harvesting methods, and the enemies of the bean.
855. Wing, Joseph E. Meadows and pastures. 418pp. Chicago, The Breeder's Gazette, 1911. 60.1 W72M
This book includes a very brief section on farm uses of soybeans, pp. 208-210, and quotes from Farmers' Bulletin 372, pp. 210-212, on soybeans.
856. Yoshimura, Kiyohisa, Nishida, Kotaro, and Yamada, Aritonō. [Organic fertilizers. VIII. The soy bean as a green manure.] Agr. Chem. Soc. Japan. Jour. 7(3, whole no. 78): 199-204. March 1931.
J385 Ag8

Feeding

857. Agnoli, Di Renzo, and Untersteiner, Laura. Contenuto in vitamina A e B delle farine di lenti, di avena e di soja. Quaderni della Nutrizione 3(1-2): 44-48. March 1936. 389.8 Q2
Bibliography, p. 48.
A study of the vitamin A and B content of lentil, oat and soybean meal.
858. Agnoli, Di Renzo, and Untersteiner, Laura. Valore alimentare della farina di soja nella nutrizione dei giovani animali. Quaderni della Nutrizione 3(1-2): 42-43. March 1936. 389.8 Q2
Growth experiments on young guinea pigs, showing the great food value of soybean meal in the nutrition of young animals.
859. Archer-Daniels-Midland Co., Milwaukee, Wis., Soybean division. 44% protein. New process soybean oil meal and soybean flakes. [6]pp. Milwaukee, Wis. [1937?] (Bull. no. 5) Pam. Coll. (Soybeans)
Discussion of the feeding value of soybean oil meal.
860. Austin, Russell H. Effect of soil type and fertilizer treatment on the composition of the soybean plant. Amer. Soc. Agron. Jour. 22(2): 136-156. February 1930. 4 Am34P
"A part of thesis presented to the Michigan State College in partial fulfillment of the requirement for the degree of doctor of philosophy..."
"The value of the soybean plant for hay is dependent upon the composition of the plant. If the plant has not had access to sufficient amounts of the essential elements of plant food and is deficient in one or more of the essential elements, its feeding value is less than it would have been normally."
Fertilizer tests with soybeans are described.
861. Bacharach, A. L. The growth-promoting properties of vitamin D. Quart. Jour. Pharm. 1(1): 49-60. January-March 1928. 396.8 Q2
Soybean oil as a source of vitamin A, but not of vitamin D, as discovered in feeding tests, is discussed.
862. Bailey, S. Waldo. Soy beans for hay and silage. Rural New Yorker 78(4516): 67. Jan. 11, 1919. 6 R88
The value of the hay and silage and harvesting methods are briefly described.
863. Beaumont, A. B., and Stitt, R. E. Soybeans for Massachusetts. Mass. Agr. Expt. Sta. Bull. 309, 16pp. Amherst, 1934.
"To meet the emergencies of shortage in the supply of forage due to crop injury caused by soil or climatic limitations, an interest in certain special annual crops is warranted. This study was undertaken to determine the adaptability of soybeans for that purpose."

864. Becker, R. B., Neal, W. M., Dawson, C. R., and Arnold, P. T. Dix. Soy beans for silage. Fla. Agr. Expt. Sta. Bull. 255, 24pp. Gainesville, 1932.
Literature cited, p. 24.
"In order to obtain reliable information as to the feasibility of ensiling legume forages under Florida conditions, a study of several factors involved in this problem was undertaken with soybeans."
865. Beeson, K. E. Soy beans as a crop and feed. Grain & Feed Jours. Consolidated 66(12): 790. June 24, 1931. 298.8 G762
"From address...before Indiana Grain Dealers Ass'n."
Outline of results in feeding soybeans to beef cattle, hogs, lambs and poultry, is given. Expansion of soybean production for crushing purposes must depend, according to the author, "upon the extent to which their products, oil and meal, find a profitable market in competition with similar commodities already in the field."
866. Bibbins, A. L. Soy beans make a sure hay crop. Rural New Yorker 83(4792): 691. April 26, 1924. 6 R88
The value of soybean hay, the method of making it, yield, and the success found in planting a combination of soybeans and sudan grass, are discussed.
867. Bliss, G. R. Producing pork, beef and milk with soy beans. Wallaces' Farmer 45(3): 162. Jan. 16, 1920. 6 W15
The increase in soybean growing in Iowa, varieties suited to various uses, and soybeans for hogging down are discussed in part. It is said that the soybean is "going to prove a cheap source of beef, pork and mutton production, as well as one of the most potent factors in enriching the soil."
868. Bohstedt, G. Feeding soybeans and soybean oil meal. Flour & Feed 37(6): 18, 19. November 1936. 298.8 F66
"For several years a nutritional research program with soybean oil meal has been conducted at the University of Wisconsin, which project has been supported by Allied Mills, Inc. This work was conducted on an industrial fellowship basis, where Dr. J. W. Hayward, during two years, was the research worker or industrial fellow who had immediate supervision of the work, and where Dr. H. J. Deobald has succeeded him...
"One of the main objects has been the effect of varying degrees and duration of temperature employed in the process of manufacturing expeller soybean oil meal, and along with it hydraulic and solvent soybean oil meal. Pigs, poultry and laboratory rats were used for experimental animals..."

869. Bohstedt, G. Soys on a barnyard menu. *Successful Farming* 35(12): 24, 68-69. December 1937. 6 Sul2
An account of the methods in processing soybeans, and the means whereby the best oil meal may be selected for feeding purposes.
870. Briggs, George M. Soybeans and other supplementary feed crops. *Wis. Agr. Col. Ext. Serv. Spec. Circ.*, 4pp. [n.p.] 1933. 275.29 W75S
The advantages of planting soybeans, harvesting for hay, and the use of the crop in mixtures are considered, among other things.
871. Brown, F. A. Sudan grass and soy beans for hay crops. *Rural New Yorker* 82(4768): 1390. Nov. 10, 1923. 6 R88
It is found that sudan grass and soybeans give "estimated yield, four to five tons of dry hay per acre, and a hay that is superior to Timothy in feeding value, and better liked by the stock."
872. Brown, L. C. Soy beans aid balanced farming. *Orange Judd Farmer* 70(2): 28, 34. Jan. 15, 1922. 6 Or1
"...We need to do closer figuring of costs. We need to grow more of those crops which can be utilized for balancing up corn in feeding dairy cows, hogs and beef cattle.
"Let's see how soybeans fill the gap."
873. Bunn, Abran. Soy beans - why not? *Country Gent.* 78(31): 1138-1139. Aug. 2, 1913. 6 C833
"The soy bean is going to do for the North what the cowpea is doing for the South, and it is going to do more. It will ultimately make us largely independent of the oilmeal for which we now pay tribute to the South and will lower the price of the mill feeds used so heavily in our dairying."
874. Burnett, L. C. Soybeans in the cornbelt. A crop that demonstrated its worth. *Successful Farming* 19(3): 18, 46. March 1920. 6 Sul2
"Feeders are now using all of the available supply and our only solution of the protein problem lies in our ability to produce more protein on cornbelt farms.
"The soybean is the crop best adapted for measuring the production of protein in this section. It is an annual legume; it will grow anywhere that corn grows, and with about the same degree of success. The ways in which it may be utilized are numerous and varied."
875. Christ, Heinrich. Stoffwechselfersuche an wiederkäuern. (Sojabohnenschrot, mischfutter und zuckerschnitzel.) *Zeitschrift für Züchtung. Reihe B. Tierzüchtung und Züchtungsbiologie* 29(1): 67-84. January 1934. 442.8 Z35

Results of experiments on metabolism in ruminants. Extracted soybean meal was one of the feeds used.

876. Coultas, W. H. Soybean oilmeal. Flour & Feed 32(8): 23. January 1932. 298.8 F66
"In this brief discussion, we will consider the importance of soybean oil meal as a livestock feed."
877. Culbertson, C. C. Getting the most out of the soy bean hay and grain. Bur. Farmer (Iowa Farm Bur. Messenger) 10(2): 20. October 1934. 280.82 B89
Soybeans as feed for livestock.
878. Davis, Russell S. Legume crop for cornbelt farms. A Hereford breeder outlines his personal experiences with soybeans. Breeder's Gaz. 85(19, whole no. 2213): 575. May 8, 1924. 49 B74
The writer cites the experiments of the Indiana Experiment station to show the profit in using soybeans for hog feed, and finds that they are also useful for stock feeding.
879. Dodson, W. R. Soybeans are valuable for silage when grown with other feed crops. U. S. Dept. Agr. Yearbook 1930: 489-490. Washington, D. C. 1 Ag84Y
The writer describes a series of feeding experiments at the Iberia Livestock Experiment Farm near Jeanerette, La. Soybean harvesting problems are also outlined.
880. Edmondson, J. B. If your clover failed, try soybean hay. Successful Farming 30(5): 5, 56-57. May 1932. 6 Sul2
Varieties to select for hay and the time of harvesting are briefly mentioned.
881. Elting, E. C., and LaMaster, J. P. Molasses as a preserving agent in making soybean silage. Assoc. South. Agr. Workers Proc. (1935)36: 506-507. 4 C82
Abstract of paper.
Gives the results of feeding tests.
882. Elting, E. C. Molasses as a preserving agent in making soybean silage. Jour. Dairy Sci. 18(7): 440. July 1935. 44.8 J822
Abstract of paper presented at annual meeting of the American Dairy Science Association.
"In the test herein reported blackstrap molasses was employed as a preserving agent in the making of soybean silage."
883. Enver, Ismail. Beitrag zur kenntnis der einwirkung verschiedenfach entfetteter sojaschrote auf das blutbild bei haustieren. 51pp. [n.p., 1933] 444 En8
Inaug.-diss. - Tierärztl. hochschule, Berlin.
Bibliography, pp. 47-49.

This is a study of the influence of extracted soy meal on the blood form (blutbild) of domestic animals. It includes a general section on the soybean which brings out its importance and value and some of its uses in various countries.

884. Evvard, John M. Soybeans in stock rations. Wallaces' Farmer 57(4): 96. Feb. 20, 1932. 6 W15

The following questions which Mr. Evvard answers were asked by the editor of Wallaces' Farmer and Iowa Homestead: 1. Does soybean oil meal ever make soft pork? 2. Is there a difference in soybean oil meals? 3. How does soybean oil meal work with poultry? 4. What about feeding this oil meal to steers?

885. Gilchrist, Douglas A. Palm kernel cake, palm kernel meal, and cocoanut cake, compared with soya cake, for fattening cattle, young store cattle, and fattening sheep, 1915-1916. Northumb. Co. Ed. Com. Bull. 25, 8pp. Cockle Park, 1917. 103 N81B

Tables give summarized results of feeding experiments.

886. Godby, R. W. Why he grows soybeans. Soybean enthusiast reports on their feeding value. Wallaces' Farmer 54(18): 689-690. May 3, 1929. 6 W15

The writer has used soybeans as a protein supplement for milk cows, fattening calves, and hogs.

887. Gonzáles, A. de J. Cultivo y utilización de la soya como forraje. Revista de Agricultura, Comercio, y Trabajo (Cuba) 14(3): 5-42. September 1932. 8 Ag88Re

References, p. 42.

This article takes up the cultivation and use of the soybean as forage. It describes, among other things, the food value of the soy, its agricultural history and uses in various countries, harvesting, expected returns from soybean crops (with tables giving figures); and uses in animal feeding; in combination with corn, sudan grass and cowpeas; in green forage; as hay; ensilage; utilization of the seed; use for soy cake; soybeans as feed for dairy cattle, for hogs, for sheep, for horses and mules, for poultry; and chemical composition and digestibility of the soybean.

The paper is based in large part on findings of experiment stations of the United States. Numerous tables show the return in seed for various varieties, chemical composition of seed of various varieties, chemical composition of soy hay (Mammoth variety), and digestible nutrients of soybeans in the various forms in which they are used for animal feed. A graph shows the digestible protein in soy cake as compared with other animal feeds.

888. Gouin, R. Le soja, fourrage vert. L'Agriculture Pratique 102(19): 657-659. May 7, 1938. 14 J82

This article on the use of the soybean as a green forage briefly describes the harvesting of the crop and discusses its nutritive value.

889. Grantham, A. E. Experiment with soy beans. Pract. Farmer 115(4): 68. Feb. 15, 1919. 6 P88
The writer relates the experience of a farmer who found his soybeans were improved by inoculation, and the milk production of his cows and appearance of his stock and horses improved by the soybeans.
890. Grantham, A. E. Suggestions for growing soy beans. Pract. Farmer 112(9): 192. May 1, 1916. 6 P88
The importance of soybeans for feeding livestock is included in this article.
891. Gt. Britain. Board of agriculture and fisheries. The soy bean. Gt. Brit. Bd. Agr. Jour. 16(9): 735-737. December 1909. 10 G79J
Report of experiments designed to test the comparative feeding value of soybean cake and decorticated cotton cake.
892. [Gt. Britain. Board of agriculture and fisheries.] The utilisation of cereal offals and certain other products for feeding purposes. Roy. Soc. Arts Jour. 62(3230): 966-968. Oct. 16, 1914. 501 L847J
"Special leaflet published by the Board of Agriculture and Fisheries." - Note.
Includes a brief section on soybean cake and meal.
893. Great utility of the soy bean. Ohio Farmer 141(21, whole no. 3663): 695. May 25, 1918. 6 Oh3
This article is made up of four letters, taking up 1) soybeans as a rich source of protein (J. L. Justice); 2) soybeans as a cause in increasing milk production (J. H. Withers); 3) soybeans as a feed for stock ("Bean Raiser"); and 4) soybeans as a good, though expensive food for hogs (G. C. Kreglow).
894. Hackleman, J. C. Future of the soybean as a forage crop. Amer. Soc. Agron. Jour. 16(3): 228-236. March 1924. 4 Am34P
"Paper read as part of the symposium on 'The Forage Problem' at a meeting of the Society held in Chicago, Ill., November 12, 1923."
"Summarizing, therefore, it would seem conservative to draw the following conclusions: First, that the acreage of soybeans will and should increase; second, that the most profitable outlet for the production will be as a seed crop and as a home-grown nitrogenous feed, substituting for the high-priced commercial concentrates; third, that applications of limestone to the soil must be recognized as essential to the most successful permanent production of soybeans; fourth, that, after sweetening the soil, more efficient methods of inoculation must be found; and, fifth, that legumes must be classified more nearly on the basis of their special or particular values. Alfalfa is pre-eminently a hay plant; sweet clover the best for green manure and pasture; red clover for dual-purpose hay and pasture legume; and soybeans the best annual nitrogenous seed and hay-producing plant."

895. Hansen, J. Sojabohnenkuchen. Deutsche Landwirtschaftliche Presse 36(41): 439-440; (42): 452-453. May 22, 26, 1909. 18 D482
Feeding experiments with soybean cake.
896. Hansson, N. Sojamjöl och sojakakor. K. Landtbruks-Akademien, Stockholm. Handlingar och Tidskrift 48(3): 272-274. 1909.
Libr. Cong. S11.S86
"This is a discussion of the value of these two feeding stuffs [soybean meal and soy cake]..." - Expt. Sta. Rec. 21(5): 471. October 1909.
897. Hayden, C. C., and Perkins, A. E. Soybean hay and soybean silage. Ohio Agr. Expt. Sta. Bimonthly Bull. 11(5, whole no. 122): 178-179. September-October 1926.
The writers report a test to determine the preferability of curing the soybeans for hay or putting them into the silo with the corn.
898. Hayward, J. W. The nutritive value of soybean oil meal prepared by the different methods of oil extraction. Oil & Soap 14(12): 317-321. December 1937. 307.8 J82
Literature cited, p. 321.
"This article is primarily a review of the literature pertaining to the subject..." - Abstract, p. 317.
899. Hayward, J. W. Soybean oil meal. Recommendations on how to use it for maximum results. Flour & Feed 36(9): 18. February 1936. 298.8 F66
Formulas are included.
900. Honcamp, F., Helms, W., Malkomesius, Ph., Meier, O., and Naumann, K. [New studies of the feeding value of different soybean extraction residues.] Zeitschrift für Züchtung. Reihe B: Tierzüchtung und Züchtungsbiologie 31: 355-371. 1935. 442.8 Z35
Not examined.
901. Honcamp, Fr. Die sojabohne und ihre abfallprodukte. Die Landwirtschaftlichen Versuchs-Stationen 73(4-5): 241-284. [Aug. 9, 1910] 1910.
Bibliography, p. 284.
Investigations in the chemical composition of the soybean and the uses of it and its by-products for feeding.
An extract from this appeared under the title: "Die Sojabohne und ihre Verwertung" in Tropenpflanzer 14(12): 613-634. December 1910. 26 T75
902. Honcamp, Fr. Ueber den wert der sojakuchen als futtermittel. Deutsche Landwirtschaftliche Presse 37(70): 757; (71): 769-770. Sept. 3-7, 1910. 18 D482
A discussion of data obtained by different investigators who have conducted feeding tests with soy beans..." - Expt. Sta. Rec. 23: 772. 1910.

903. Horvath, A. A. Some biochemical aspects of soybean oil. Oil & Soap 15(3): 75-76. March 1938. 307.8 J82
"The many peculiar effects of soybean oil feeding don't bear evident relationship to the composition of the fatty acids. The known 'impurities' as well as some unknown factors seem to play a leading role in defending its properties." - Abstract.
904. Illinois. Agricultural experiment station. Utilizing the soybean crop in livestock feeding. Ill. Agr. Expt. Sta. Circ. 369, 44pp. Urbana, 1931.
Rapid increase in soybean acreage brings problem of utilization, by H. P. Rusk, pp. 3-4; Making use of soybeans in feeding dairy cattle, by W. B. Nevens, pp. 5-11; Soybeans for beef-cattle feeding, pp. 12-22; Soybeans for sheep, by W. G. Kammlade, pp. 23-26; Soybeans for horses and mules, by J. L. Edmonds and C. W. Crawford, pp. 27-29; Soybean crop has limited use in rations for swine, by W. E. Carroll, pp. 30-38; Objections to beans for fattening swine do not apply to soybean oil meal, by W. E. Carroll, pp. 39-41; Soybeans for poultry, by H. J. Sloan, pp. 42-44.
905. Iowa State college of agriculture and mechanic arts, Ames. Feeding soybeans. Iowa Agr. Col. Ext. Circ. 215, 24pp. Ames, 1935.
Prepared by the staffs of the Iowa Agricultural Experiment Station and the Iowa State College.
The value of soybeans as hay, straw, silage and pasture, and the use of the crop for dairy cows, beef cattle, sheep, swine, horses and mules, and poultry, are discussed.
906. Joliffe, C. F. Experience with soys. Natl. Stockman and Farmer 44(35): 1037. Nov. 27, 1920. 6 N21
The author finds that soybeans grown for a hay crop are the most profitable of any he knows, the only objections being the difficulty of curing and the high cost of seed. These may be overcome.
907. Kapp, H. J. Great demand for soybeans. Grain & Feed Jours. Consolidated 72(12): 535. June 27, 1934. 298.8 G762
"The drouth has brought the soybean into prominence in territories out of the regular producing areas, mainly as a forage crop to be sown on acres where government restrictions have been removed."
908. Kloser, Frank J. Soy beans with corn for silage. Wallaces' Farmer 44(17): 946. Apr. 25, 1919. 6 W15
The advantages of growing soybeans with corn for silage and the best varieties for the purpose are briefly enumerated.
909. Lacey, James. Corn and soybeans for silage. Hoard's Dairyman 57(10): 499, 503. March 28, 1919. 44.8 H65
The writer relates the experiences of Mike Flanagan of Lafayette

County, Wisconsin, in growing corn and soybeans for silage. Mr. Flanagan is quoted as saying "From the standpoint of labor saving and also of securing maximum production, I do not see how we can do better than to grow those splendid crops in the same field..."

910. Lebedev, I. A. Sneshannye posevy na korn kukuruzy soi podsolnechnika. 15111pp. [Moskva] 1932. 60 L492

"Spisok ispol'zovannoi literatury", pp. 150-[152].

At head of title: Vsesoiuznyi Nauchnoissledovatel'skii Institut Soi i Spetsial'nykh Kul'tur.

Mixed sowings for fodder of maize, soybeans and sunflowers. Includes some discussion of yields per acre in mixed sowings of these crops, and their feeding value as silage.

911. Liu, T., and Chen, C. Y. [Nutritive value of soya-bean press-cake.] Science [China] 18(5): 636-648. May 1934. C475 Sci22

Text in Chinese.

"The cake contained 43% of protein with digestibility 77-81%, and nutrient val. similar to that of meat or caseinogen. It is deficient in vitamin-A." - Ch. Abs. in Brit. Chem. Abs. (Suppl. to Soc. Chem. Indus. Jour.) B:379. May 3, 1935. 382 B773.

912. M., J. W. Value of soy beans. Rural New Yorker 79(4585): 901. May 8, 1920. 6 R88

The advantages of the crop, its valuable qualities and uses as feed, hay and for hogging down are outlined.

913. McArthur, William. Soybeans as emergency hay crop. Grower rates soys as best substitute for alfalfa or clover. Wallaces' Farmer 52(16): 620. April 22, 1927. 6 W15

This is the first of two articles telling "how to make use of soybeans with the greatest profit." The second follows in the issue of Wallaces' Farmer and Iowa Homestead for April 29, 1927, p. 656.

914. McArthur, William. Soybeans make hay on short notice. Northern Iowa farmer tells how beans fill the gap in a short hay year. Wallaces' Farmer 49(22): 820. May 30, 1924. 6 W15

Financial advantages of planting soybeans are mentioned.

915. Mathews, I. J. A crop that gives grain and hay. Soybeans supply legume hay and a high protein grain. Dairy Farmer 21(1): 5, 23. Jan. 1, 1923. 44.8 K56

"Farmers everywhere welcome the soybean as a crop that will give them a legume hay for feeding and a grain crop that can be ground and fed with corn silage to make a more nearly balanced ration, that can be produced right at home. But with this welcome comes specific problems of how best to work the crop into the rotation system; how to put them out so they will not compete with the corn, for labor is of first importance."

916. [Mitchell, H. H., and Beadles, Jessie R.] Soybeans found richer in certain vitamins than corn. Ill. Agr. Expt. Sta. Ann. Rept. (1935)48: 90-91. Urbana, 1936.
Progress report of investigations. Vitamins A, B and G were studied in soybeans and corn. Report continued in Ill. Agr. Expt. Sta. Ann. Rept. (1935-36)49: 83. 1937, under title "Soybeans Much Poorer than Yellow Corn in Vitamin A."
917. Morrison, F. B. Feeds and feeding. A handbook for the student and stockman. Ed. 20., unabr., 1050pp. Ithaca, New York, The Morrison pub. co., 1936. 389.7 M833 Ed. 20
"First to Ninth Editions by the late W. A. Henry...Tenth to Fourteenth Editions by W. A. Henry, assisted by F. B. Morrison. Fifteenth to Nineteenth Editions revised and rewritten by F. B. Morrison."
Soybeans for forage, pp. 265-268; food value of soybeans, pp. 369-371; production of soybean oil, and use of the cake, pp. 371-372; soybean by-products, pp. 372-373; soybeans as feed for dairy cows, pp. 532-533; soybean hay, pp. 540-541; soybeans and soybean oil meal as feed for beef cattle, pp. 672-674; soybean hay for beef cattle, p. 680; soybean silage, p. 693; soybeans and soybean oil meal as feed for sheep, p. 759; soybean hay for sheep, p. 763; soybeans as feed for swine, pp. 886-888; soybean oil meal for swine, pp. 888-890; soybean oil meal combinations for swine, pp. 890-891; soybean pasture for swine, p. 902.
918. Neal, W. M., and Becker, R. B. A chemical study of ensiling soybeans. U. S. Dept. Agr. Jour. Agr. Research 46(7): 669-673. Washington, D. C., April 1, 1933. 1 Ag84J
"Literature cited", p. 673.
"In the course of an investigation of the feeding value of soybean silage, observations were made upon the normal changes that occur in soybeans during the ensiling process. These observations were made in an effort to determine the efficiency of the silo in preserving the feed nutrients of a legume roughage. Such information is of particular importance in regions where seasonal rainfall ordinarily prevents the satisfactory curing of hay."
919. O'Brien, Harry R. Soy-bean magic. Country Gent. 88(13): 4, 18. March 31, 1923. 6 C833
Describes the results obtained by feeding soybeans to hogs, cows, poultry and horses.
920. Odland, T. E. Soybeans for silage and for hay. W. Va. Agr. Expt. Sta. Bull. 227, 24pp. Morgantown, 1930.
"The purpose of this bulletin is to present the results of experiments conducted under West Virginia conditions...These

experiments include a test in which corn and soybeans were grown alone in various ways and in various combinations for silage purposes. In another experiment soybeans were grown alone and in combination with various other crops for hay. The experiments also include tests in which soybeans were sown at various rates and at different dates for hay."

921. Odle, L. A. Soy beans for stock feeding. *Purdue Agr.* 17(7): 134, 136. April 1923.

It is said that "if the farmers of the Corn Belt can produce a satisfactory protein, they are independent of limited amount and high prices" and that "the soybean seems to be the logical plant."

922. Purdue University Department of agricultural extension, Divisions of agronomy, dairy husbandry, animal husbandry, and poultry husbandry. Feeding soybeans and soybean oilmeal on Indiana farms. *Ind. Agr. Col. Ext. Bull.* 180, (rev.) 8pp. Lafayette, 1934.

"Ground or whole soybeans, and soybean oilmeal are being used in farm rations, and should be used as protein supplements rather than fattening feeds. Rations in which they may be fed satisfactorily to hogs, cattle, sheep and poultry are indicated in this publication, together with safeguards in their use, comparisons of soybean hay with other legume hay in sheep and cattle feeding operations are also reported.

"Recommendations are based on results of experimental work at the Purdue University Experiment Station."

923. Richey, P. S. Soybeans for cornbelt stock-farms. *Breeders' Gaz.* 75(23, whole no. 1958): 1358. June 5, 1919. 49 B74

"The soybean has a great future in the cornbelt. No other legume yields so great a quantity of digestible protein to the acre. No other legume is so easily or so quickly grown. It supplies a home-grown protein supplement to the standard cornbelt grain crops at less expense than it can be supplied by any other source. It is worthy of consideration on every farm, and specially on farms where live stock is raised and prepared for market."

924. Robison, W. L. The influence of the method of oil extraction on the feeding value of soybean oilmeals. *Amer. Soc. Anim. Prod. Proc.* (1924): 60-63. 1925. 389.9 Am3R

Results of trials at the Ohio Agricultural Experiment Station.

"If the results of the two trials are indicative of what may ordinarily be expected from the use of these different types of soybean oilmeals, the expeller meal with a nut-like taste and odor and the hydraulic meal will prove valuable feeds, while the solvent meal and the raw-tasting expeller meal will be found unsatisfactory."

925. Roquemore, Everett E. Soybean oil meal high protein feed. Flour & Feed 32(11): 16-17. April 1932. 298.8 F66
The uses for the soybean, and its popularity as a feed are discussed. The many uses for the crop now being discovered and the acreage reduction in it are seen as causes for higher prices.
926. Scheffbeck, Willi. Über sojabohnenvergiftung und vergiftung mit chlorkohlenstoffen. 41pp. [Kallmünz, Gedruckt bei M. Lassleben] 1926. 391 Sch2
Inaug.-diss. - Tierärztl. hochschule, Hannover.
"Literaturverzeichnis", page after p. 41.
This is an account of research on soybean poisoning and poisoning with carbon tetrachloride in animals.
927. Scheunert, A., and Richter, K. Der wert der sojabohne als futtermittel. Fortschritte der Landwirtschaft 3(24): 1130-1133. Dec. 15, 1928. 19 F77
Feeding experiments with rats to test the nutritive value of extracted and unextracted soybeans as animal food.
928. Semple, A. T. Feeding soybeans. Successful Farming 33(11): 41-42. November 1935. 6 Sul2
Contains directions for feeding soybeans to various animals.
929. Seulke, K. J. Formula changes and why. Flour & Feed 34(9): 20, 21. February 1934. 298.8 F66
Experiments undertaken by various experimenters showing the value of soybean oil meal as a source of protein in animal nutrition are cited, including cattle, hogs and poultry. It is concluded that "Formula changes contemplated by feed manufacturers should take into consideration the incorporation of soybean oil meal both from the standpoint of economy and the welfare of the feeder of their product."
930. Shrewsbury, Charles L., and Bratzler, John W. Cystine deficiency of soybean protein at various levels, in a purified ration and as a supplement to corn. U. S. Dept. Agr. Jour. Agr. Research 47(11): 889-893. Washington, D. C., Dec. 1, 1933. 1 Ag84J
"A part of the material in this paper was submitted by the junior author to the School of Agriculture, Purdue University, as a thesis in partial fulfillment of the requirements for the bachelor of science degree." - Ed. note.
"Soybeans are generally fed to livestock as a supplement to corn or other carbohydrate-rich feed. The experiments described in this paper were designed to reinvestigate the reported deficiency of soybean protein at a level of 10 percent, to determine whether a cystine deficiency existed at a protein level of 15 percent, and whether a ration made from corn and soybeans, such as is used in swine feeding, would exhibit a cystine deficiency."

931. Slate, William L., Jr., and Brown, B. A. Corn and soybeans as a combination crop for silage. Conn. Agr. Expt. Sta. Bull. 133, pp. 353-[378.] Storrs, 1925.

Bibliography, p. 376.

This is a report of four years' work with corn and soybeans for silage.

"To be of any great value the soybeans must sufficiently reduce the nutritive ratio and increase the total yield of feed per acre, to pay a profit on the cost of adding them to the farm crop." The various problems connected with the growing of the crops in combination are discussed.

932. Some facts about soy bean meal. Corn belt farmers ought to use more of this superior high protein feed. Bur. Farmer (Ill. Agr. Assoc. Sec.) 7(2): 12. October 1931. 280.82 B89

"Live stock feeders, particularly in the corn belt, should use this superior protein supplement. In many cases these same farmers are growing soy beans for sale as a cash crop. A satisfactory market for commercial soy beans is directly dependent upon a larger consumption of soy bean oilmeal in live stock feeding."

933. Soule, Andrew M., and Fain, John R. Crops for the silo. Tenn. Agr. Expt. Sta. Bull. v. 17, no. 1, 24pp. Knoxville, January, 1904.

Soybeans are among the crops considered. Costs of cultivating the crops, harvesting costs, and their value for silage are discussed.

934. [Soybean cake as a food.] Agr. Chem. Soc. Japan Jour. 7(2, whole no. 77): 87-96. February 1931. J385 Ag8

Bibliography, p. 96.

I. Oil-extracting process and digestion coefficient of the protein, by S. Izume and Y. Yoshimaru.

II. Nutritive value of the alcohol-extracted oil cake, by S. Izume, Y. Yoshimaru, and I. Konatsubara.

III. Effect of addition of the soya-bean oil cake to other grain, by S. Izume and I. Konatsubara.

Abstracted by Chemical Abstracts in Brit. Chem. Abs. (Suppl. to Soc. Chem. Indus. Jour.)B: 1119. Dec. 11, 1931. 382 B773

935. Soybean meal day at Wooster. Flour & Feed 36(6): 8-9. November 1935. 298.8 F66

"The annual Feed Merchants' Day at Ohio Agricultural Experiment station, Wooster, on Oct. 9, brought together nearly two hundred men interested in feeds and feeding..."

Abstracts and excerpts from some of the speeches on soybean meal as a valuable ingredient for feeds are given.

936. Soy flour in dog food. Natl. Provisioner 98(19): 25. May 7, 1938. 286.85 N21

The food value of the soy flour is described.

937. Ten Eyck, A. M. Cowpeas vs. soy beans. Orange Judd Farmer 60(22): 6. May 27, 1916. 6 Orl
Cowpeas, rather than soybeans, are recommended for Winnebago County (Illinois) farmers, because the writer feels that the latter "are not productive enough to be a valuable crop for feed, either as forage or grain."
938. Terroine, E. Laits artificiels pour l'élevage du bétail. Société d'Hygiène Alimentaire Bull. 19(1-2): 1-23. 1931. 389.9 SolB
Bibliography, p. 23.
Includes a section on the feeding of soy milk to animals, with tables showing results.
939. Thatcher, L. E. Corn and soybeans for silage. Yields obtained in experiments at Wooster. Ohio Agr. Expt. Sta. Monthly Bull. 7(5-6, whole nos. 77-78): 79-81. Wooster, May-June, 1922.
"The results obtained [1917-1921] from growing soybeans with corn for silage by the Agronomy Department of the Ohio Agricultural Experiment Station at Wooster agree, in the main, with those obtained at Columbus by the Department of Farm Crops as reported in the...article, 'Growing Soybeans in Corn' [in this same issue of the Monthly Bulletin, pp. 75-78].
"This experiment indicates that in a combination of soybeans and corn or sunflowers, the yield of the soybeans is determined by the amount of competition with the companion crop, a competition which varies greatly with the rate and method of planting and with weather conditions, as is pointed out in the preceding article."
940. Thatcher, L. E., and Park, J. B. Protein content of soybean hay. Ohio Agr. Expt. Sta. Bimonthly Bull. 183, pp. 131-136. November-December 1936.
It is pointed out that "the protein content of soybean hay is influenced by the stage of development at the time of harvest."
The results of harvesting experiments are given.
941. Thompson, John. Growing soybeans for hay. Wallaces' Farmer 55(16): 796-797. Apr. 19, 1930. 6 W15
"This legume should be used more as a catch crop."
942. Titus, Harry W. Soybeans and soybean (oil cake) meal. Grain & Feed Journ. Consolidated 71(7): 306-307. Oct. 11, 1933. 298.8 G762
A discussion of the feed value of soybeans and oil meal.
943. Tomlinson, Walter S. Soybeans planted with corn. Ohio Farmer 137(21, whole no. 3558): 707. May 20, 1916. 6 Oh3
Cultivation, harvesting, yields, and use of the crop for silage are briefly mentioned.

944. Watson, C. J., Woodward, J. C., Davidson, W. M., Muir, G. W., and Robinson, C. H. The digestibility of Canadian feeding stuffs - soybean oil meal. *Scientific Agr.* 17(1): 22-30. September 1936. 7 Sci2

Literature cited, p. 27.

"Continuing the studies on the digestibility of Canadian feeding stuffs, data are presented in this paper for soybean oil meal, produced by the expeller process. A comparison is also made between the feeding values of this soybean oil meal and of linseed oil meal upon the basis of digestibility trials."

A résumé of the article appears in French on p. 27.

945. Whittier, A. C. A study of soy bean hay. *Del. Agr. Expt. Sta. Bull.* 112, 18pp. Newark, 1916.

The following summary is given:

"Special chemical determinations on soy bean hay were made. Chemical tests of soy bean hay with reference to the possible presence of a compound which acts unfavorably on the animal organism are recorded. Methods of extraction and feeding of same to guinea pigs are described and discussed. An extract of soy bean hay was obtained which is poisonous. This extract which is soluble in 70 to 80% alcohol and water and precipitated by lead acetate was found to be poisonous to guinea pigs."

946. Wiggans, R. G. Corn and soybeans for silage. *N. Y. (Cornell) Agr. Expt. Sta. Bull.* 548, 36pp. Ithaca, 1932.

References, pp. 35-36.

"There are very few users of silage who would not, other things being equal, choose to use corn-soybean silage rather than silage made from corn alone. The problem, then, is not a question of the relative value of the two kinds of silage, but how to produce the better feed economically and, if possible, at no greater cost than is incurred in the production of straight corn silage. It is the purpose of this publication to report experimental work relating to this problem..."

947. Wiggans, R. G. Effect of growing corn and soybeans in combination on the percentage of dry matter in the two crops. *Amer. Soc. Agron. Jour.* 26(1): 59-65. January 1934. 4 An34P

"Paper No. 195, Department of Plant Breeding, Cornell University, Ithaca, New York..." - Note.

"During the past 9 years a series of experiments have been conducted at the Cornell University Agricultural Experiment Station for the purpose of studying the possibilities of the soybean as a silage crop in combination with corn. The results of these tests are being published as Station Bulletin 548, 1932..."

"In connection with these experiments it was necessary to take many shrinkage samples, since the value of silage is very largely dependent on total dry weight. The purpose of this paper is to

report the effect of growing corn and soybeans in combination on the percentage of dry matter in the two crops."

948. Wiggans, R. G. Pole beans vs. soybeans as a companion crop with corn for silage. Amer. Soc. Agron. Jour. 27(2): 154-158. February 1935. 4 Am34P
"Paper No. 207, Department of Plant Breeding, Cornell University, Ithaca, New York..." - Ed. note.
"The purpose of this brief report is to present data obtained from experiments planned to give information on this problem."
949. Wilkins, F. S. Growing soy beans in corn. Wallaces' Farmer 47(19): 608. May 12, 1922. 6 W15
"That it is a profitable practice to plant soy beans with corn for silage is indicated by results to date of experiments conducted by the farm crops section of the Iowa experiment station. These results show an increase in total silage yield per acre for land on which soy beans were grown with the corn, over land which grew corn alone...The results of these feeding tests confirm the statements of many farmers that soy beans and corn mixed together in the silo make a much more satisfactory feed than corn silage alone."
950. Wilkins, F. S. Use soy beans to replace oil meal. Iowa farmer describes his methods of growing beans for a seed crop. Wallaces' Farmer 74(14): 456. Apr. 7, 1922. 6 W15
William McArthur, of Cerro Gordo County, Iowa, shews that it is "a paying proposition to grow soy beans for feed to take the place of oil meal as feed for stock."
951. Willard, C. J. Soybean hay. Ohio Agr. Col. Ext. Serv. Crop Talk 12, [4]pp. Columbus, 1924.
Soybeans as a supplement to clover, harvesting of the beans, handling of the hay, and value of the hay are considered.
952. Wisconsin. Agricultural experiment station. Findings in farm science. Annual report of the Director (1935-36) 53d, 168pp. Madison, 1937. (Bull. 438)
The section Poultry and Game Birds has a subsection entitled: Learn More About the Value of Soybean Oilmeal for Poultry, pp. 56-57, in which it is stated:
"A feeding trial this past year sought to determine whether larger than ordinary supplements of minerals are needed with soybean oilmeal rations. It is a common practice to feed extra minerals with them. However, the work done here by H. J. Deobald (Allied Mills, Inc., Industrial Fellow), J. G. Halpin, and C. E. Holmes (Poultry Husbandry) demonstrates that if the birds are allowed to run in the sunlight at all times except in the most severe winter weather, rickets will be prevented and normal growth secured when the ration contains 2% limestone..."

The section on Animal Nutrition has a subsection entitled "Study Nutritive Value of Soybean Proteins," pp. 130-131. In this it is said that "It is highly desirable to know why soybean oilmeal gives poor results when prepared at low temperatures. If this were thoroughly understood, it might be found practical to adjust or fortify soybean rations so that even raw soybeans could successfully be fed.

"With this idea in mind feeding trials with rats have been continued by M. Johnson, H. Steenbock (Agr. Chemistry), and H. T. Parsons (Home Economics).

953. Withrow, W. A. Growing soy beans in Indiana. Rural New Yorker 78 (4522): 303. Feb. 22, 1919. 6 R88

Varieties for silage and hay are suggested, and the yield which may be expected is mentioned.

954. Wright, P. A., and Shaw, R. H. A study of ensiling a mixture of sudan grass with a legume. U. S. Dept. Agr. Jour. Agr. Research 28(3): 255-259. Washington, D. C., Apr. 19, 1924. 1 Ag84J

"This paper reports a study of ensiling a silage crop high in protein and low in carbohydrates, mixed with one low in protein and high in carbohydrates, to determine whether such a mixture makes better silage than the same crops ensiled separately.

"Two legumes, soybeans and cowpeas, were the high-protein crops used, and Sudan grass was the low-protein, high carbohydrate crop."

Cattle

955. Anthony, Ernest L., and Henderson, H. C. Soybean vs. alfalfa hay for milk production. W. Va. Agr. Expt. Sta. Bull. 181, 10pp. Morgantown, 1923.

"In order to ascertain how the soybean compares with alfalfa as a feed for the production of milk, the following experiment was planned in which soybean hay was to be fed in comparison with alfalfa hay."

956. Barney, F. C. I'd feed ground soybeans to a dairy herd. Successful Farming 34(12): 62-63. December 1936. 6 Su12

"Soybeans are admittedly a cheap, home-grown source of protein. At the same time their fat content (around 17 percent) probably is of more importance and value in the dairy ration than many dairymen realize."

957. Bechdel, S. I. Soybean hay for milk production. Pa. Agr. Expt. Sta. Bull. 201, 16pp. State College, 1926.

Literature cited, p. 16.

"The purpose of this bulletin is to report the results of feeding trials in which soybean hay was compared with alfalfa hay for milk production. Since soybean hay carries digestible nutrients just slightly higher in amount than alfalfa hay...it is evident that the comparison should give reliable information on the feeding value of the former."

958. Briggs, George M. Soy beans as an economical dairy feed. Hoard's Dairyman 65(15): 556. April 27, 1923. 44.8 H65
"Those farmers...raising soy beans have certainly found as near a substitute for linseed and cottonseed meal as can be found on the market. The wonderful results from soy bean hay and ground beans should inspire anyone at all interested in economical dairy production."
959. Bruce, W. Report on cattle-feeding experiments, 1909-1910. Edinburgh & East of Scotland Col. Agr. Bull. 21, 15pp. Edinburgh, 1910. 103 Ed4B
"These experiments were undertaken for the purpose of testing Soya bean-cake as a feeding-stuff in comparison with linseed-cake."
960. Caldwell, R. E. The value of soybean and alfalfa hay in milk production. Ohio Agr. Expt. Sta. Bull. 267, pp. 125-145. Wooster, 1913.
This bulletin gives the results of two experiments whose purpose is to discover whether home-grown feeds may be used to produce dairy products, inasmuch as the cost of nitrogenous concentrates is almost too high for some dairymen. In the first experiment, soybean hay is compared with bran and cotton-seed meal as a source of protein, pp. 125-138. A financial statement is included.
961. Cannon, C. Y., and Johnston, Floyd. Soybeans for dairy cows. Iowa Agr. Col. Ext. Bull. 196, 16pp. Ames, 1934.
Value of soybeans in the dairy ration, and growing and harvesting the crop are explained.
962. Clemson Agricultural college of South Carolina, Clemson College. Influence of ground soybeans on market milk production. S. C. Agr. Expt. Sta. Rept. (1929)42: 54-55. Clemson College, 1929.
"There is a conflict of opinion and experimental evidence as to the effect of soybeans on dairy products. In January, February and March, 1929, a study was made of the influence of ground soybeans on the flavor and odor of market milk, and on the flavor, odor, and texture of butter obtained by churning cream from cows being fed soybeans in different proportions in their grain mixtures."
963. Cook, Alfred S. Soy bean meal vs. cotton seed meal. N. J. Agr. Expt. Sta. Ann. Rept. (1913)34: 293-316. Trenton, 1914.
This is also the 26th Annual report of the New Jersey Agricultural College Experiment Station.

The object of the experiment was: "1. To determine the feeding value of Soy Bean meal as compared with Cotton Seed meal. 2. To determine whether Soy Bean meal in connection with home-grown Corn meal will produce milk more economically than a ration containing purchased grains."

Numerous tables show the milk and butterfat production of each group of cows on soybean meal and cotton seed meal rations, and the yield and costs of producing milk and butterfat on these rations.

964. Duggar, J. F. Vetch, cowpea, and soy bean hay as substitutes for wheat bran. Ala. Agr. Expt. Sta. Bull. 123, pp. 49-72. Montgomery, 1903.

"The object of the feeding experiments herein described was to ascertain whether hay made from hairy vetch, cowpeas and soy beans could be advantageously substituted for most of the wheat bran in the ration of dairy cows."

965. Fairchild, L. H., and Wilbur, J. W. Soy bean oilmeal and ground soy beans as protein supplements in dairy rations. Jour. Dairy Sci. 8(3): 238-245. May 1925. 44.8 J82

References, p. 245.

"An experiment, divided into two parts, has recently been completed at the Purdue Experiment Station. The first part of this experiment was conducted to compare the value of soy bean oilmeal with linseed oilmeal as protein supplements in the grain ration of the dairy cow. The second part compared the value of ground soy beans with linseed oilmeal for milk and fat production."

966. Fairchild, L. H., and Wilbur, J. W. Soybean oilmeal and ground soybeans as protein supplements in the dairy ration. Ind. Agr. Expt. Sta. Bull. 289, 20pp. Lafayette, 1924.

References, p. 20.

"The objects of this experiment were: 1. To make comparisons of the value of soybean oilmeal and ground soybeans with linseed oilmeal as protein supplements in the dairy ration. 2. To determine the effect of the addition of a mineral mixture to this ration."

967. Forbes, E. B., Braman, Winfred W., and Kriss, Max. Net-energy values of corn silage, soy-bean hay, alfalfa hay, and oats. U. S. Dept. Agr. Jour. Agr. Research 34(8): 785-796. Washington, D. C., April 15, 1927. 1 Ag84J

"With the cooperation of J. August Fries, C. D. Jeffries, R. W. Swift, Rowland B. French, and J. V. Maucher, Jr..."

"The following net-energy values, per kilogram of dry matter of feeds, for the maintenance of approximately 800-pound 2 to 3 year old beef steers are submitted, these values being determined by direct calorimetry, using the heat production during fast as the measure of the maintenance requirement of net energy: Corn silage, 2,098 Calories; soy-bean hay, 1,502 and 1,689 Calories; alfalfa hay, 1,272 and 1,327 Calories; and ground oats, 2,224 and 2,476 Calories..." - Summary p. 795.

968. Gerlaugh, Paul. Soybean oilmeal in cattle fattening rations. Grain & Feed Jours. Consolidated 75(6): 270. Sept. 25, 1935. 298.8 G762
Results of feeding experiments at the Ohio Agricultural Experiment Station.
969. Gilchrist, Douglas A. Soya beans and soya cakes. Mark Lane Express 100(4054): 667. June 7, 1909. 10 M34
Reports effects on quantity and quality of milk produced and on live weights of cows in soybean feeding experiments.
970. Grinnells, C. D., and Moore, J. L. The comparative values of peanut and soybean hay for milk production. Assoc. South. Agr. Workers Proc. (1937)38: 235, processed. [Atlanta, Ga., 1937.] 4 C82
Abstract of paper.
Tabulates the results of three trials.
971. Grinnells, C. D., and Moore, J. L. The comparative values of peanut and soybean hay for milk production. N. C. Agr. Expt. Sta. Bull. 312, 28pp. Raleigh, 1937.
"The data indicate that peanut hay of similar quality is equal to soybean hay for milk production. The results from one feeding trial do not, however, warrant one in drawing definite conclusions...
"The price of the peanut hay usually runs about one-third less than that of soybean. On a basis of feed cost per hundred pounds of milk, considerable saving may be effected by the use of peanut hay in feeding dairy cows."
972. Grinnells, C. D., and Moore, J. L. Peanut versus soybean hay for dairy cattle. Assoc. South. Agr. Workers Proc. (1937)38: 225, processed. [Atlanta, Ga., 1937.] 4 C82
Abstract of paper.
Gives the results of three feeding trials, in which it was found that good peanut hay is of equal or slightly greater value than an equal quantity of soybean hay.
973. Hansson, Nils. Wert der sojakuchen und des sojamehls bei der fütterung von milchkühen. Fühlings Landwirtschaftliche Zeitung 59(2): 49-63. Jan. 15, 1910. 18 F95
This is an account of experiments conducted in Sweden on the use of sunflower cake, soybean meal and soybean cake in the feeding of milking cows.
An article with a similar title appeared in Stockholm. Meddelande från Centralanstalten för Försöksväsendet på Jordbruksområdet no. 15, p. 51. 1910.
974. Hauge, S. M., Wilbur, J. W., and Hilton, J. H. A further study of the factor in soybeans affecting vitamin A value of butter. Jour. Dairy Sci. 20(2): 87-91. February 1937. 44.8 J822
References, p. 91.

"1. Further studies have been made of the vitamin A suppressing factor in soybeans which interferes with the transference of the vitamin A activity of the feed to the butterfat secreted by dairy cows. 2. This factor was found to be distributed in both the soybean oil and soybean oil meal secured by either the expeller process or by chemical solvents. 3. The suppressing action is not due to the presence of oil in the ration but to some factor in soybean oil in the bean. 4. Prolonged extraction of soybeans first with ethyl ether and then with ethyl alcohol failed completely to remove this factor..." - Summary, pp. 90-91.

975. Hayden, C. C. Alfalfa and soybean hay for growing heifers. Ohio Agr. Expt. Sta. Bimonthly Bull. 11(3, whole no. 120): 98-103. Wooster, May-June 1926.

Among the conclusions it is stated that "the results show alfalfa hay to be a little superior to soybean hay and the previous test showed alfalfa hay a little superior to clover hay for heifers when liberally fed with corn."

976. Hayden, C. C., and Perkins, A. E. Soybean hay and soybean silage. Ohio Agr. Expt. Sta. Bimonthly Bull. 11(5, whole no. 122): 178-179. September-October 1926.

Among the conclusions the following is made:

"1. This one test is not sufficient to warrant final conclusions but it indicates practically no difference in the feeding value of soybeans preserved by the two methods. Dairymen probably can use either method with equally good results."

977. Hayden, C. C., and Perkins, A. E. Soybeans and soybean oilmeal for milk production. Ohio Agr. Expt. Sta. Bimonthly Bull. 11(4, whole no. 121): 137-141. July-August 1926.

This is an account of the results of two tests on the use of soybeans as a source of protein in dairy rations: One test compares ground soybeans with linseed oilmeal, and the other compares soybean oilmeal with linseed oilmeal.

978. Herrmann, L. F., and Bowling, G. A. Soy bean hay as a sole roughage for dairy cows. Jour. Dairy Sci. 19(7): 461-462. July 1936.

Abstract of paper presented at annual meeting of American Dairy Science Association.

"Two trials were conducted to determine if soy bean hay as the sole roughage in the ration is as efficient as soy bean hay and corn silage."

979. Hilton, J. H., Wilbur, J. W., and Hauge, S. M. A comparison between ground soybeans and linseed oilmeal as protein supplements for growing dairy calves. Jour. Dairy Sci. 15(4): 277-281. July 1932.
44.8 J822

References, p. 281.

At the end of two trials upon eight calves, at the Purdue Agricultural Experiment Station, it is said that "ground raw soybeans and linseed oilmeal were found to be equally effective as protein supplements in the grain rations for growing heifer calves when fed with alfalfa hay."

980. Hilton, J. H., Wilbur, J. W., and Epple, W. F. Early, intermediate and late cut soybean hay for milk and butterfat production. Ind. Agr. Expt. Sta. Bull. 346, 24pp. Lafayette, 1931.
Bibliography, p. 24.
This bulletin gives the results of three experiments, covering a three-year period, carried out with the object of comparing the relative feeding value of soybean hay cut in different stages of maturity for milk and fat production. Time to harvest soybeans for hay, pp. 3-5; Yields per acre at different stages of maturity, pp. 9-10.
981. Hilton, J. H., Wilbur, J. W., and Hauge, S. M. Ground soybeans and linseed oil meal for growing dairy calves. Ind. Agr. Expt. Sta. Bull. 354, 8pp. Lafayette, 1931.
Bibliography inside back cover.
"Results of the feeding trials reported in this Bulletin show that ground soybeans are equal to linseed oilmeal as a protein supplement in the grain ration for growing dairy calves."
982. Hilton, J. H., Hauge, S. M., and Wilbur, J. W. The vitamin A activity of butter produced by cows fed alfalfa hay and soybean hay cut at different stages of maturity. Jour. Dairy Sci. 18(12): 795-800. December 1935. 44.8 J822
References, p. 800.
"Comparisons were made of the vitamin A value of artificially dried and field cured alfalfa and soybean hay, cut at two different stages of maturity. Studies were also made of the relationship between the vitamin A activity of the hays and the butters produced by cows fed these respective hays..."
Abstract in Jour. Dairy Sci. 18(7): 434. July 1935. 44.8 J822
983. Hilton, J. H., and Wilbur, J. W. When should we cut soybeans for hay? Successful Farming 29(7): 7, 43. July 1931. 6 Sul2
An account of the results obtained from trials held at the Purdue University Agricultural Experiment Station with cattle "to determine the relative value for milk and fat production of the hay when cut in different stages of maturity."
984. Holdaway, C. W., Ellett, W. B., and Harris, W. G. The comparative value of peanut meal, cottonseed meal and soybean meal as sources of protein for milk production. Va. Agr. Expt. Sta. Tech. Bull. 28, 43pp. Blacksburg, 1925.
Literature cited, p. 43.

"The work here reported is a compilation of data of feeding trials with peanut meal, cottonseed meal, and soybean meal...

"Since no satisfactory method has been found to compare the utilization of feed protein for milk production under all conditions, two methods are used in the case of the three concentrates being tested. An analysis of the results will be made from the standpoint of the total protein and its relation to the results and from the digestible crude protein, not considering the nitrogen balance or the metabolic feces nitrogen. Second, a modification of Thomas' formula that was used for data on growth will be used here and discussed. The last method is an attempt to apply Thomas' method to milk production, an adaptation of which was used by Nevins (8) and Mitchell and Villegas (9) in work on growth..."

985. Horn, V., and Mühl, E. Der einfluss von nicht entfetteten und entfetteten sojabohnen auf die milcherzeugung und die butterbeschaffenheit. Biedermanns Zentralblatt, Abteilung B, Tierernährung 9(1): 1-31. 1937. 384 B47T

"Aus dem Agrikulturchemischen Institut des Landes-Universität, Giessen."

English summary, p. 31.

Study on the influence of whole and extracted soybeans on milk production and the quality of butter.

986. Hunziker, O. F., and Caldwell, R. E. Test of three protein concentrates and two leguminous roughages in milk production. Ind. Agr. Expt. Sta. Bull. 203, 20pp. Lafayette, 1917.

"The purpose of this bulletin is to offer the results of an experiment designed to give directions to feeders of dairy cows, regarding the type of protein-carrying concentrates and leguminous roughages best adapted for maximum and economical milk yield." It is found, among other things, that "the use of soybean hay caused an increase in body weight and a decrease in daily milk and butter fat production."

987. Ingham, L. W., and Meade, DeVoe. Ground versus unground soybean hay for dairy cows. Md. Agr. Expt. Sta. Bull. 316, pp. 219-229. College Park, 1929.

"This bulletin is based upon data presented by Mr. J. Z. Miller in partial fulfillment of the degree of Master of Science at the University of Maryland."

"In any comparison between ground and unground roughage the practical dairyman is primarily interested in knowing what increased yields of milk and butterfat may be secured, which manner of feeding is the more practicable and profitable, and what it costs per ton to grind roughage. The experiment herein discussed was undertaken in order to obtain data which might throw light on these and other aspects of this question."

The bulletin is also contained in Maryland Agr. Expt. Sta. Report, v. 43, pp. 219-229, 1929-30.

A summary of this experiment is given by L. W. Ingham under the title "Ground vs. unground soy bean hay," in Hoard's Dairyman 73(21): 1005. Nov. 10, 1928. 44.8 H65

988. Jacobson, C. O. A comparison of alfalfa hay and soybean hay with and without mineral and cod liver oil supplement. Assoc. South. Agr. Workers Proc. (1933-35) 34-36; 512-513. 4 C82
Abstract of paper.
"Definite conclusions as to the feeding value of soybean hay when compared with alfalfa cannot be drawn from the one trial but results to date would indicate that soybean hay of good quality... could be substituted for alfalfa in a growing ration for dairy heifers."
989. Kampen, G. B. van. Die Durener krankheit. Landwirtschaftlichen Versuchs-Stationen 108(5-6): 287-304. 1929. 105.8 L23
Nachschrift, p. 304.
This is a description of research in the "Durener" cattle sickness, which has been found analogous to that recorded by Sir Stewart Stockman and caused by extracted soymeal.
990. Kampen, G. B. van. Voedingswaarde van geëxtraheerde veevoederstoffen. Chemisch Weekblad 26(7): 98-101. Feb. 16, 1929. 385 C42
Describes the nutritional value of extracted cattle feed.
991. King, F. G. Ground soybeans for fattening cattle. Ind. Agr. Expt. Sta. Bull. 237, 6pp. Lafayette, 1920.
"Analyses were made of soybeans from samples taken of the ground beans fed during a series of trials to test their feeding value. A composite sample was taken each year for three successive years. The average of the three analyses is shown in Table I, in comparison with the average analysis of cottonseed meal fed in the same tests...
"The results of substituting ground soybeans for cottonseed meal in a ration for fattening cattle are shown in Table II, which is a summary of data secured from averaging three trials with two and three-year-old steers, with ten animals in each lot..."
992. [Lane, Clarence B.] Report of the Dairy husbandman. N. J. Agr. Expt. Sta. Ann. Rept. (1903) 24: 347-411. Somerville, N. J., 1904.
"Sixteenth Annual Report of the New Jersey Agricultural College Experiment Station..."
Alfalfa hay, cow pea hay and soy bean silage as substitutes for purchased feeds. Cottonseed meal versus wheat bran and dried brewers' grains, pp. 388-411, contains a section: Experiment II. Soy bean silage and alfalfa hay versus purchased feeds, pp. 396-402, which has for its purpose "to compare the value of a ration

that could readily be grown upon the farm with one in which the protein was largely supplied by feeds commonly purchased by dairy-men, namely, wheat bran, dried brewers' grains and cottonseed meal..."

The same paper, with a few minor changes, appears as New Jersey Agr. Expt. Sta. Bull. 174, 24pp. New Brunswick, 1904, under the title "Alfalfa hay, cow pea hay and soy bean silage as substitutes for purchased feeds. Cottonseed meal versus wheat bran and dried brewers' grains", by Clarence B. Lane.

993. Levine, C. O. Soy beans versus oil meal in the ration of the dairy cow. *Lingnaam Agr. Rev.* 1(2): 7-14. June 1923. 22.5 C16
Bibliography, p. 14.
"Soy beans gave six per cent. less milk and eight per cent. more fat than did oil meal..."
994. Lindsey, J. B., Holland, E. B., and Smith, P. H. Effect of soy bean meal and soy bean oil upon the composition of milk and butter fat, and upon the consistency or body of butter. *Mass. Agr. Expt. Sta. Ann. Rept.* (1908, pt. 2) 21: 66-110. Boston, 1909. (Public Doc. No. 31.)
"This experiment is the continuation of a series designed to study the effect of different foods and food groups upon the character and composition of the product of the dairy cow."
995. Linseed meal vs. soybeans. Iowa Farmers at cattle feeders' day. *Wallaces' Farmer* 58(16): 342. Aug. 5, 1933. 6 W15
This is the report of tests made at the Iowa State College in 1932 and 1933 under Prof. C. C. Culbertson, and exhibited at Ames before one thousand farmers on July 21.
996. Lütkefels. Die einwirkung der sojakuchen auf die milchkühe und die milch. Mischmilch mit einem abnorm niedrigen fettgehalt und deren beurteilung. *Zeitschrift für Fleisch- und Milch-Hygiene* 35(20): 316-321. July 15, 1925. 449.8 Z35
This is a discussion of the influence of soybean cake on the dairy cow and on the milk, and the cause of abnormally low fat content of mixed milk. It was found that large amounts of soybean cake in the ration tended to produce large amounts of milk with a low fat percentage.
997. McCandlish, Andrew C., and Weaver, Earl. Coconut meal, gluten feed, peanut meal, and soy bean meal as protein supplements for dairy cows. *Jour. Dairy Sci.* 5(1): 27-38. January 1922. 44.8 J822
References, p. 38.
"The work reported here consisted of two trials of 150 days each in the first of which peanut meal and soybean meal were compared with old process linseed oil meal, while in the second trial coconut meal and gluten feed were compared with the linseed meal."

998. McCandlish, Andrew C., Weaver, Earl, and Lunde, L. A. Soybeans as a home-grown supplement for dairy cows. Iowa Agr. Expt. Sta. Bull. 204, pp. 45-52. Ames, 1922.

The results of the tests showed that "cracked soybeans, when fed with the home-grown ration mentioned, [corn silage, alfalfa hay, cracked corn and ground oats] are worth one-third more than oilmeal. The soybeans were palatable and had no deleterious effects on the animals. Consequently, it would appear that soybeans if grown more extensively, not only for seed purposes or for the purpose of adding protein to silage, would be a valuable home-grown protein supplement and would render many dairymen independent of the purchase of high-priced protein feeds. In this way it would be possible to conduct a dairy farm with the use of practically no purchased feeds."

These experiments are summarized in an anonymous article entitled "Soybeans for dairy cattle" in the Live Stock Jour. 99(2596): 9. Jan. 4, 1924. 49 L74

999. Mallèvre, A. Les expériences danoises concernant la valeur des tourteaux de soja pour l'alimentation des vaches laitières, et l'influence qu'ils exercent sur la qualité du beurre. Annales de la Science Agronomique Française et Étrangère 29(2): 83-100; (3): 226-228. February-March 1912. (4e Série - 1^{re} Année - 1^{er} Semestre.) 14 An75

Danish experiments on the value of soybean cake as a feed for dairy cows and its influence on the quality of butter produced.

1000. Moore, J. S., and Cowsert, W. C. Soybeans for dairy cows. Miss. Agr. Expt. Sta. Bull. 235, 15pp. A. & M. College, 1926.

Gives the results of using soybean hay as compared with alfalfa hay, lespedeza hay, and laredo hay, and ground soybeans as compared with cottonseed meal and soybean meal.

1001. Nevens, W. B., and Tracy, P. H. The relation of soybean hay and ground soybeans to flavor and composition of milk and butter. Jour. Dairy Sci. 11(6): 479-487. November 1928. 44.8 J822
References, p. 487.

"Several reports which reached the [Illinois University] Department of Dairy Husbandry during the past year stated that rations containing soybean hay or ground soybeans caused undesirable flavors in milk, cream, and butter; these products being affected to such an extent that they were not marketable or that their value was lowered...

"Experiments were therefore undertaken with the object of determining the effect of rations containing soybean hay and ground soybeans upon the flavor and composition of milk, cream, and butter."

1002. Olson, Thomas M. Soybeans for dairy cows. S. Dak. Agr. Expt. Sta. Bull. 215, 15pp. Brookings, 1925.
Literature cited, p. 15.
"The object of the investigations at South Dakota State College was to determine the feeding value of ground soybeans and soybean hay and to note if the ground soybeans had any deleterious effects on the butter...
"The results indicate that ground soybeans can be fed with profit by dairy farmers for the high protein feed, and thus decrease the cost of milk production materially..." - Digest, p. 2.
1003. Perkins, A. E. Soybeans or meal for cows. Grain & Feed Jours. Consolidated 75(9): 382. Nov. 13, 1935. 298.8 G762
Address "before feed merchants at Wooster, O."
Relative advantages and disadvantages of soybeans and soybean meal.
1004. Price, James.N. Home-grown rations in economical production of milk and butter. Tenn. Agr. Expt. Sta. Bull. 80, pp. 31-42. Knoxville, 1908.
"In order to demonstrate the feeding value of the soy bean and to prove the economy of a home-grown ration, the Experiment Station conducted a feeding experiment with its herd during the past winter. In the planning of this experiment two objects were kept in view: first, to compare the soy bean with other standard protein feeds, and, second, to compare the cost of producing milk and butter with home-grown and with purchased rations of approximately the same feeding value. The soy bean can be grown very successfully in all parts of Tennessee, and promises to become a leading dairy feed."
1005. Richter, K., and Herbst, J. Die einwirkung der verfütterung von holzzuckerhefe im vergleich zu sojaextraktionsschrot auf menge und fettgehalt der milch von kühen. Landwirtschaftlichen Versuchs-Stationen 121(3-4): 215-221. 1934. 105.8 L23
"Aus dem Institut für Fütterungstechnik der Forschungsanstalt Tschechnitz, Kreis Breslau."
This paper gives the results of feeding experiments conducted to compare the effect of feeding wood sugar yeast and extracted soybean meal upon the quantity and fat content of cows' milk.
1006. Rosengren, L. Fr. Einfluss der sojakuchen auf die beschaffenheit der butter. Milchwirtschaftliches Zentralblatt 7(2): 77-83. February 1911. 44.8 M59M
It is concluded that soybean cake fed at the rate of 2.5 kg. per head a day did not cause any undesirable flavor in the butter or otherwise affect its quality.
Also published in Meddelande från Centralanstalten för Försöksväsendet på Jordbruksområdet. Stockholm, no. 30, 8pp. Not examined.

1007. [Rusk, H. P., and Snapp, R. R.] "Toasting" soybean oil meal lowers palatability. Ill. Agr. Expt. Sta. Ann. Rept. (1933-34) 47: 73-75. Urbana, 1935.

Tests were made "to determine the relative feeding value of soybean oil meals manufactured in different ways. The cattle making the largest gains of any in the experiment were those fed meal produced at the lowest temperature."

An earlier report entitled "Processing Method May Make Soy Oil Meal Unpalatable" appeared in Ill. Agr. Expt. Sta. Ann. Rept. (1932-33)46: 72-74. Urbana, 1933.

1008. Samin, Vasfi. Zur kenntnis der einwirkung verschiedenartig entfetteter sojaschrote auf das blutbild des rindes. 63pp. [Berlin, 1932.] 389.7 Sa4

Inaug.-diss. - Tierärztl. hochschule, Berlin.

Literaturverzeichnis, pp. 59-61.

This study on the effect of extracted soy meal on the blood form (blutbild) of cattle, has a general section on the soybean, and describes the Durener cattle disease, and research on the blood structure of cattle.

1009. Schaeffer, O. G. Soybeans and soybean hay in the dairy ration. Minn. Agr. Expt. Sta. Bull. 239, 16pp. University Farm, St. Paul, 1927.

Bibliography, p. 16.

The study is divided into parts: For the first, Feeding the Soybean Seed, the following conclusions are reached:

"1. Linseed oilmeal proved slightly more valuable than ground soybeans for milk production, while ground soybeans proved superior for butterfat production; tho for all practical purposes one pound of ground soybeans will replace one pound of linseed oilmeal in the dairy ration. 2. Feeding the ground soybean supplement resulted uniformly in raising the percentage of butterfat in the milk. The average butterfat test for the ground soybean group was 4.01 per cent as compared to 3.82 per cent for the linseed oilmeal group."

For Part II. Feeding soybean hay, the author concludes:

"1. Soybean hay proved more palatable than timothy hay, the soybean hay consumption for the trial being 34 per cent greater. 2. Feeding soybean hay instead of timothy hay resulted in a 46 per cent saving of concentrates. 3. Feeding the low-protein timothy hay required the purchase of 53 per cent of the concentrates as compared to only 5 per cent when soybean hay was fed. 4. Feeding soybean hay instead of timothy hay reduced the expenditure for mill feeds by 93.6 per cent."

1010. Schaeffer, O. G. Soybeans cut feed cost. Dairy Farmer 26(3): 9, 22-23. March 1928. 44.8 K56

Summarizes the results of feeding experiments conducted by the University of Minnesota's dairy division to determine the value of soybean seed and soybean hay as a source of protein in the dairy ration.

1011. Seulke, K. J. Why soybean oil meal? Flour & Feed 34(10): 22-23. March 1934. 298.8 F66

"Soybean oil meal is the newest of the high protein feed ingredients. Although it has been on the market for quite a few years, its use in dairy rations has not become as prevalent as its value and importance warrant due to a number of reasons: First, because of the fact that until within the last few years the supply has not been sufficiently great to permit its year around use in commercial feeds on a large scale; second, because of its confusion with other soybean products, and third, because there are several grades of soybean oil meal on the market due to processes of manufacture and source, some of which lack decidedly in palatability. A fourth reason for restricted use of soybean oil meal and probably the greatest reason is the lack of understanding on the part of feed mixers and feeders alike as to the actual value of soybean oil meal and the part that it plays in the ration of the various classes of livestock..."

An extract of this is printed in Grain & Feed Jours. Consolidated 72(6): 262. March 28, 1934. 298.8 G762

1012. Shoptaw, LaVan Neill, Espe, D. L., and Cannon, C.Y. Gastric digestion of soybean flour. Jour. Dairy Sci. 20(3): 117-128. March 1937. 44.8 J822

"Journal Paper No. J357 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 47."

References, p. 128.

"A soybean gruel made by mixing one part of soybean flour with nine parts of water was compared with whole and skim milk for calf feeding..." - Summary, p. 128.

1013. Shoptaw, LaVan Neill. Gastric digestion of soybean flour when used as a substitute for cows' milk in feeding dairy calves. Iowa State Col. Jour. Sci. 11(1): 105-106. October 1936. 470 Io9

"Original thesis submitted December, 1935. Doctoral thesis number 356."

The results of three series of trials are said to indicate that "Assuming that the volume of gastric secretion is in direct proportion with gastric digestion, then soybean flour, fed as in these trials, is digested in the calf's stomach at a slightly more rapid rate than either whole or skimmed cows' milk."

1014. Shoptaw, LaVan Neill. Soybean flour as a substitute for cow's milk in feeding dairy calves. Jour. Dairy Sci. 19(2): 95-99. February 1936. 44.8 J822

Literature, p. 99.

"Because of the success that was had in feeding infants on soybean milk, an experiment was planned to determine the effectiveness and economy of using soybean milk as a substitute for cow's milk in rearing dairy calves."

1015. Snethan, Alfred. Some new feeding stuffs and their relative value as cattle foods. Roy. Lancashire Agr. Soc. Jour. 1909: 28-45.
10 L22
Soya beans or China oil beans, pp. 29-32.
1016. Snell, M. G. Machine dried soybean hay for fattening cattle. La. Agr. Expt. Sta. Bull. 257, 18pp. Baton Rouge, 1934.
"Literature cited", pp. 15-18.
This is a report of the results of feeding trials to discover how the machine-dried hay compares with field-cured hay as a feed, and whether it pays.
1017. Snell, M. G. Machine dried versus field cured soybean hay for beef steers. Amer. Soc. Anim. Prod. Proc. (1932) 25: 67-69. 1933.
389.9 An3F
Results of feeding trials, 1930-1931, at the Louisiana Agricultural Experiment Station. A comparison of prices is included.
1018. Le soja dans l'alimentation du bétail. L'Engrais 25(22): 613. June 3, 1910. 57.8 En7
Reports an alleged case of poisoning of 55 cows by soybean meal.
1019. Soybean hay for the dairyman. Wallaces' Farmer 54(19): 741. May 10, 1929. 6 W15
"When we remember that soybean hay stands as high as alfalfa as a protein roughage, and supplies protein cheaper than linseed meal, that it can easily be added to the farming program for 1929, that it is a sure crop, with no extra equipment or liming costs, and that it is highly palatable to all classes of livestock, it would seem that many farmers should avail themselves of this method of avoiding a hay shortage next winter."
1020. Stockman, Ralph. Soya meal as a cattle food. Jour. Compar. Path. and Ther. 40(4): 266-273. December 1927. 41.8 J82
Gives the results of experiments in feeding soy meal to rabbits, in an effort to see why cattle died upon being fed soy meal from which the oil had been extracted.
1021. Stockman, Sir Stewart. Cases of poisoning in cattle by feeding on meal from soya bean after extraction of the oil. Jour. Compar. Path. and Ther. 29(2): 95-107. June 1916. 41.8 J82
As a result of the experiments and observations conducted, it is concluded that "extracted soya meal constitutes an excellent auxiliary foodstuff for cattle but it is inadvisable to use trichlorethylene as the extractor."
An abstract of this is printed anonymously under the title: Extracted soya meal poisoning, in Jour. Bd. Agr. [Gt. Brit.] 23(7): 691-692. October 1916. 10 G79J

1022. Takahashi, Eiji, Iguchi, Kenzo, Mitamura, Kentaro, and Shirahama, Kiyoshi. The influence of soy bean cake upon milk production and the quality of butter. 66pp. [Dairen?] Published by South Manchurian Railway co., 1934. 389.7 T13
Bibliography, pp. 65-66.
"An experiment was conducted upon the effects of Manchurian soy bean cake on cows. The influence of the daily amount, or of combining with other feeds, upon the quality and quantity of milk, especially on the physical and chemical properties of butter were studied..." - Conclusion, p. 64.
1023. Thomas, B. H., Culbertson, C. C., and Beard, Fred. The effect of ingesting soybeans and oils differing widely in their iodine numbers upon the firmness of beef fat. Amer. Soc. Anim. Prod. Proc. (1934) 27: 193-199. 1935. 389.9 Am3R
"Journal Paper No. J-218 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 370."
This is a continuation of studies reported in the 1933 Proceedings.
1024. Thomas, B. H., and Culbertson, C. C. The effect of soybeans upon the firmness of beef fat. Amer. Soc. Anim. Prod. Proc. (1933) 26: 65-70. 1934. 389.9 Am3R
"Journal Paper No. K140 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 36."
"...Realizing fully the softening influences of soybeans upon hogs and the penalty exacted from hog producers by the packer for marketing soft hogs, numerous farmers now are asking whether the firmness of beef is similarly influenced deleteriously by feeding large allowances of soybeans. In view of the foregoing and realizing, too, that the acreage planted to soybeans in Iowa is increasing annually, the following report of a preliminary investigation into this question is made..."
1025. Tomhave, A. E. Soybean meal and ground soybeans as protein supplements for dairy cattle. Del. Agr. Expt. Sta. Bull. 148, 19pp. Newark, 1927.
Reference to literature, p. 19.
"Part I of this bulletin deals with the results obtained from the feeding of soybean meal, followed in part II by the results obtained from the feeding of ground soybeans."
1026. Wiggans, R. G. Combinations of corn and soybeans for silage. N. Y. (Cornell) Agr. Expt. Sta. Bull. 634, 34pp. Ithaca, 1935.
"Paper No. 211, Department of Plant Breeding, Cornell University, Ithaca, New York."
References, pp. 33-34.
"All factors considered, a combination of corn and soybeans for silage is a practice to be highly recommended to the dairymen

of New York State as a means of increasing production, improving silage, reducing the amount of concentrates necessary, and adding another legume to the cropping system, all of which tend to decrease the cost per unit of production." - Conclusions, p. 32.

1027. Wilbur, J. W., Hilton, J. H., and Hauge, S. M. The effect of soybeans in the rations of dairy cows upon the vitamin A value of butter. Jour. Dairy Sci. 18(10): 661-665. October 1935. 44.8 J822
References, p. 665.
Gives the results of feeding experiments.
1028. Wilbur, J. W., Hauge, S. M., and Hilton, J. H. A further study of the factor in soybeans affecting the vitamin A value of butter. Jour. Dairy Sci. 19(7): 447. July 1936.
Abstract of paper presented at annual meeting of American Dairy Science Association.
Study "for the purpose of determining what component part or parts of the soybean carry this action" of suppressing action on the formation of vitamin A in butter, when fed to dairy cows.
1029. Wilbur, J. W. Soybean hay. Purdue Agr. 25(8): 160, 175. May 1931. 6 P97
Results of feeding trials "conducted with dairy cows to determine the relative feeding value of soybean plants cut at different stages of maturity for hay" at Purdue University.
1030. Wilbur, J. W. Soybeans for dairy cows increase fat in milk. Purdue Agr. 28(7): 51, 59. April 1934. 6 P97
"E. J. McVey and W. S. Arbuckle cooperating."
This is a summary of results of feeding trials to determine the effect of soybeans on the fat content of milk.
1031. Williams, N. K., Cannon, C. Y., and Espe, D. L. Production of dairy cows when fed only silage and cracked soybeans. Jour. Dairy Sci. 19(7): 459. July 1936.
Abstract of paper presented at annual meeting of American Dairy Science Association.
Experiment at Iowa State College.
1032. Wisconsin. Agricultural experiment station. Soybean hay for milk production. Wis. Agr. Expt. Sta. Ann. Rept. (1922-23) 40: 99-100. Madison, 1924. (Bull. 362)
Results of feeding trials conducted by Morrison, Savage, and Hulce.
Similar experiments were conducted and reported in later annual reports as follows:
Soybeans vs. alfalfa hay for dairy cows. Wisconsin Agr. Expt. Sta. Ann. Rept. (1923-24) 41: 92. Madison, 1925. (Bull. 373)
Experiments conducted by Morrison, Hulce, and Humphrey.

Soybeans vs. alfalfa hay for dairy cows. Wisconsin Agr. Expt. Sta. Ann. Rept. (1924-26) 42: 127-128. Madison, 1926. (Bull. 388) Experiments conducted by Morrison, Humphrey; I. W. Rupel and associates.

1033. Woll, F. W., and Humphrey, G. C. Soy bean silage as a food for dairy cows. Wis. Agr. Expt. Sta. Rept. (1904) 21: 67-74. Madison, 1904.

"The objections to soy-bean silage, which have been stated in the preceding, would not, in our experience, apply to the mixed corn-soy bean silage. According to our present experience, we may, therefore, consider this silage mixture an improvement on corn silage, in so far as it furnishes a succulent, palatable feed, containing a somewhat larger proportion of nitrogenous food materials than is found in pure corn silage."

1034. Wuyts, L. Le tourteau de soya et la qualité du beurre. L'Engrais 27(42): 1166. Oct. 18, 1912. 57.8 En7

"Journal des Sociétés Agricoles du Brabant et du Hainaut."

"When soy bean meal 2.5 kg. per head per day is fed to milk cows mixed with the other rations, the quality of the butter is neither injured in purity or in taste. When meal which contains other seeds than soy beans is fed the cows are sometimes poisoned and the butter tastes. 2.5 kg. is the max. feed of soy bean meal per head, per day." - Chem. Abs. 7: 1064. Jan.-April 1913.

Hogs

1035. Barnett, E., and Goodell, C. J. Corn and soy beans for pork production. Miss. Agr. Expt. Sta. Circ. 49, 7pp. A. & M. College, 1923.

"Corn and soy beans are among the most valuable crops grown in Mississippi for the production of pork. From the standpoint of economy, they are the most satisfactory feeds that have been used in the finishing of spring pigs at the Mississippi Experiment Station and the results of several years' work indicate the wisdom of their more extensive propagation for this purpose."

1036. Bedenbaugh, P. G. Grazing and feeding trials with corn and soybeans for pork production. Miss. Agr. Expt. Sta. Bull. 283, 8pp. A. & M. College, 1930.

"Realizing that the use of soybeans was rapidly increasing in the State, both as a soil improver and for the production of pork, experimental work was carried out at the Mississippi Experiment Station to try to determine the most desirable variety and economical way of utilizing the beans for the production of pork. Most of the trials conducted were with the Mammoth Yellow and Laredo beans, since they were two of the leading varieties being grown in the State."

1037. Bohstedt, G., Fargo, J. M., and King, W. A. Soybean oil meal and other plant protein rations for pigs, supplemented with limestone and bone meal. Amer. Soc. Anim. Prod. Proc. (1937) 30: 107-110. 389.9 Am3R 1937.
An account of feeding experiments at the University of Wisconsin.
1038. Bray, Charles I. Hogging down corn and green soybeans. Assoc. South. Agr. Workers Proc. (1933-35) 34-36: 111-112. [n.p., 1935?] 4 C82
Abstract of paper.
The writer gives the conclusions reached after two experiments conducted in 1931 and 1932 at the Louisiana Agricultural Experiment Station. Costs of hogging off corn and soybeans are included.
1039. Bull, Sleeter, Carroll, W. E., Olson, F. C., Hunt, G. E., and Longwell, J. H. Effect of soybeans and soybean oil meal on quality of pork. Ill. Agr. Expt. Sta. Bull. 366, pp. 33-80. Urbana, 1931.
"In the spring of 1925 a series of five experiments was undertaken the purpose of which was to study the value of soybeans in the ration of market hogs and their effects on the value of the carcasses...
"In these experiments the points primarily considered were the effect of soybeans on rate and economy of gains, on dressing percentages, on shrinkage of carcasses in the cooler, and on firmness of carcasses and cured cuts (ham and bacon). An attempt was also made to find methods by which soybeans and their principal by-product, soybean oil meal, might be fed to hogs without deleterious results."
Statistical tables illustrate these points.
1040. Bull, Sleeter. Soybeans not guilty. Scientist says lack of finish is real culprit in soft pork indictment. Breeder's Gaz. and Dairy Trib. 97(2, whole no. 2431): 10. February 1932. 49 B74
"It is apparent that altho soybeans produce soft pork, this should not be particularly alarming for three reasons: (1) the amount of soybeans now available for hog feeding is small and can account for only a relatively small amount of soft pork; (2) the demand for soybean oil will probably furnish a more profitable outlet for soybeans than hog feeding; and (3) the quicker, more economical gains obtained with soybean oil meal or tankage will cause the beans available for feed to be utilized for other purposes."
1041. Carmichael, B. E. Soybean pasture for fattening hogs. Md. Agr. Expt. Sta. Bull. 376, pp. 299-311. College Park, 1935.
Report of results of an experiment to obtain information concerning the use of soybean forage for young hogs being fattened for market. Table 6 is a financial statement of the experiment.
1042. [Carroll, W. E., Smith, R. A., Bull, Sleeter, and Longwell, J. H.] Soybean test compares hogging-down vs. dry lot. Ill. Agr. Expt. Sta. Ann. Rept. 1926/27, pp. 82-84. Urbana, 1927.

An investigation "on the relative values of hay and seed types of soybeans when planted with corn for hogging-down. Also, the effect of these types of soybeans upon the quality of the resulting pork when they are hogged-down with corn..." The results of the year's work is summarized.

1043. Carter, C. E. Corn plus soys equals pigs. Country Gent. 84(49): 30. Dec. 6, 1919. 6 C833
The writer relates the experiences of Knox County, Missouri, farmers in growing soybeans in their corn.
1044. Carter, C. E. Hogs, corn and soybeans. A good combination in Knox county, Missouri. Swine World 6(11): 7. June 1919. 46.8 Sw62
Experiences of Knox County farmers with soybeans.
1045. Culbertson, C. C., Thomas, B. H., Beard, F. J., and Hammond, W. E. The influence of soybeans upon the gains, feed requirements, and character of the fat produced when fed to growing and fattening spring pigs on rape pasture. Iowa Agr. Expt. Sta. Anim. Husb. Leaflet 150, 6pp., processed. Ames, February 1936.
"The data presented in this leaflet are those gathered in the fourth of a series of experiments to determine the most practical way to make use of soybeans and soybean products in Iowa's swine feeding yards." A table showing costs of 100 pounds' gain and margin per pig over feed costs is given.
1046. Dalbey, D. S. Pork production in Illinois. Ill. Agr. 6: 74-80. 1902. 6 I16
Includes figures of increase in weight and value of hogs pastured on soybeans for a summer, pp. 78-79.
1047. Davidson, H. R. Soy beans make soft pork. Swine World 23: 5. January 1937. 46.8 Sw62
Not examined.
1048. Davis, Russell S. Soybeans increase farm efficiency. Breeder's Gaz. 79(18, whole no. 2055): 816. May 5, 1921. 49 B74
"Soybeans furnish the stock-farmer with one practical means of increasing his farm's efficiency. Their value for pork production was well demonstrated by the following experiment..." Feeding tests made by the Purdue University Experiment Station are also cited.
1049. Ferrin, E. F. Expeller processed soybean oil meal compared with other protein supplements. Amer. Soc. Anim. Prod. Proc. (1935) 28: 104-106. 1936. 389.9 An3R
Gives the results of two experiments with hogs, conducted at the Minnesota Station.

1050. Ferrin, E. F., and Johnson, Don. The soybean and its relation to soft pork. Amer. Hampshire Herdsman 8(10): 16. October 1933. 46.8 Am33
The difficulty of marketing soft pork produced by soybeans is pointed out. Soybean oilmeal, however, was proved satisfactory.
1051. Ferrin, E. F. Soybeans as a part of the protein supplement for growing pigs. Swine World 21(7): 7. June 1934. 46.8 Sw62
This is a summary of the results of feeding experiments at the [University of Minnesota?] Station, in the summer of 1931.
1052. Flint, P. N. Spanish peanuts, soy beans and skim milk as feeds supplementary to corn. Ga. Agr. Expt. Sta. Bull. 87, 10pp. Experiment, 1909.
The results of an experiment in feeding Spanish peanuts, soybeans and skim milk to pigs as a supplement to corn. A financial statement of the experiment is included, as well as the costs of seeding and cultivating one acre of soybeans and one acre of Spanish peanuts.
1053. Glassmann, B., and Gologorskaja, S. Verdauungsversuche an milch und sojanährpräparaten. Zeitschrift für Untersuchung der Lebensmittel 72(5-6): 450-452. November-December 1936. 384 Z39
"Artificial digestion expts. were made with soy sour cream, soy 'quarg', soy protein (Tophu), cow milk sour cream and milk 'quarg.' The digestibilities of the first were 2-3 times greater than that of the sour cream from cow milk, but the digestibilities of the other products were about the same. Without the addn. of some material to better the flavor, the soy, preps. would be difficult to use." Chem. Abs. 31(16): 5886. Aug. 20, 1937.
1054. Godbey, E. G., Kyzer, E. D., and Clyburn, T. M. Green soybeans, alfalfa, and permanent pastures as forages for fattening hogs. S. C. Agr. Expt. Sta. Bull. 289, 16pp. Clemson College, 1933.
"The objects of these experiments were - 1. To compare full feeding of corn and fishmeal in dry lot with limited and full feeding of corn and corn and fishmeal to hogs grazing green soybeans. 2. To compare alfalfa and permanent pasture and green soybeans as forages for fattening hogs receiving corn and fishmeal free-choice. 3. To compare Biloxi and Ocotan soybeans as green forages for fattening hogs. 4. To determine the effect of these rations on the hardness of fat produced."
1055. Godbey, E. G., and Durant, A. L. Protein supplements to corn in dry lot for fattening pigs. S. C. Agr. Expt. Sta. Bull. 234, 14pp. Clemson College, 1926.
"The following tests were conducted to determine the relative efficiency of these by-products, soybean oil meal and peanut feed, and the older well established protein supplements, tankage and fish meal..."

1056. Godbey, E. G. Rations for fattening hogs on soybean forage. S. C. Agr. Expt. Sta. Bull. 274, 15pp. Clemson College, 1931.
"The objects of these experiments were:
(1) To compare full feeding of corn and tankage in dry lot with limited and full feeding of corn and of corn and tankage to hogs grazing soybeans.
(2) To determine the effect of these rations on the hardness of fat."
1057. Godbey, E. G., and DuRant, A. L. Soybean forage for hogs. S. C. Agr. Expt. Sta. Bull. 228, 15pp. Clemson College, 1926.
"The high price of corn and tankage makes the cost of producing pork on this ration very high. The acreage planted to soybeans in South Carolina has increased rapidly, both as a hay crop and for forage. The series of tests reported in this bulletin was planned to determine the value of this crop as a forage for hogs. The results given were obtained from experiments conducted on soft pork in cooperation with other Southern experiment stations and the United States Department of Agriculture. Only the feeding value of soybean forage is reported in this publication; no reference is made to the quality of pork produced..." - Introduction.
1058. Good, Edwin S., and Mann, L. B. An experiment comparing velvet bean meal, tankage and soy bean meal as supplements to corn meal in feeding hogs. Ky. Agr. Expt. Sta. Circ. 20, 4pp. Lexington, 1918.
"This experiment again emphasizes the value of soy beans as a supplement to corn in the growing and fattening of hogs, for the results of the lot receiving soy beans in its ration compared very favorably with those of the lot receiving tankage. Soy beans can, to a large extent, take the place of tankage in swine feeding operations and, as the best grades of tankage are now retailing at about \$100.00 per ton, one can well understand the great economic importance of the soy bean."
1059. Good, Edwin S., and Smith, Mark J. Hogging down soy beans and cowpeas. Ky. Agr. Expt. Sta. Bull. 201, pp. 139-149. Lexington, 1916.
"The object of this experiment, the results of which are given in this bulletin, was to determine the relative amounts of gain, as well as the economy of gains, made by pigs hogging down soy beans, with and without a supplementary ration of corn, and when hogging down cowpeas with a supplementary corn ration."
1060. Gray, Dan T. Soybean pastures for hogs. N. C. Agr. Col. Ext. Circ. 85, 8pp. Raleigh and West Raleigh, 1919.
"Reprint and revision of Experiment Station circular no. 24."
The value of soybean pasture, carrying capacity of each acre of soybeans, and pounds of pork made on each acre, are discussed.

1061. Grimes, J. C., Sewell, W. E., and Taylor, W. C. Soybean hay as a supplement to white corn and tankage for growing and fattening hogs. Ala. Agr. Expt. Sta. Ann. Rept. (1929) 40: 13-14; (1930) 41: 25; (1931) 42: 22-23. Auburn, 1929-1931.
Progress reports of feeding trials. The second and third reports are for work done by J. C. Grimes and W. E. Sewell.
1062. Hankins, O. G. Pork firmness is modified by feed and other factors. U. S. Dept. Agr. Yearbook, 1930: 415-418. Washington, D. C., 1930.
1 Ag84Y
Soybeans as a cause of soft pork are mentioned.
1063. Haselhoff, Emil. Schweinemastversuche mit sojabohnenmehl. Fühling's Landwirtschaftliche Zeitung 61(12): 401-414. June 15, 1912. 18 F95
"This is a report of experiments with 36 pigs, testing the feeding value of soy-bean meal as compared with other concentrated feeds..." - Expt. Sta. Rec. 29: 371. 1913.
1064. Hays, Frank A. Swine production in Delaware. Del. Agr. Expt. Sta. Bull. 124, 43pp. Newark, 1919.
Experiment VI, Soy Bean Forage for Fattening Growing Pigs, pp. 38-39, gives a table of results which includes such information as pork produced with one acre of soybeans with grain, value of pork produced on one acre soybean forage, and returns from one acre of soybean forage.
1065. Hayward, J. W., Bohstedt, G., and Fargo, J. M. Soybean oil meals prepared at different temperatures as feed for pigs. Amer. Soc. Anim. Prod. Proc. (1934) 27: 123-126. 1935. 389.9 Am3R
References cited, p. 126.
"In our experiments we are attempting to determine the effect that the temperature of oil extraction has upon the relative efficiency of the protein of soybean oil meal...
"It is the purpose of this paper to make a brief progress report on two hog feeding experiments which were conducted by the University of Wisconsin Experiment Station..."
1066. Helmrich, F. H. Feeding of soybeans to hogs in definite proportions and their effect upon the quality of pork. Amer. Soc. Anim. Prod. Proc. (1928): 105-106. 1929. 389.9 Am3R
"The South Dakota Experiment Station has completed two years experimental work and an additional year's work has been completed at Ohio State, toward the writer's graduate study. The object of the trials was to find in what proportions soybeans could be fed with corn without affecting the quality of the pork; likewise, the influence of the hog's age and length of feeding period upon the pork produced."

1067. Horn, V., Weber, J., and Jungermann, K. Die fütterung nicht entfetteter sojabohnen an mastschweine. Biedermanns Zentralblatt, Abteilung B: Tierernährung 7(2): 131-140. April 1935. 384 B47T
"Aus dem Agrikulturchemischen Institut der Landes-Universität Giessen."
Literaturverzeichnis, pp. 139-140.
Summary in English.
Experiments in the feeding of whole soybeans to fattening pigs.
1068. Horn, V., and Mühl, E. Fütterungsversuche mit rohen und gekochten sojabohnen bei mastschweinen. Biedermanns Zentralblatt, Abteilung B: Tierernährung 8(3): 230-237. 1936. 384 B47T
"Aus dem Agrikulturchemischen Institut der Landesuniversität Giessen."
English summary, p. 237.
Gives the results of feeding trials with hog rations of raw and cooked soybeans.
1069. Hostetler, Earl H. Soybean oil meal for fattening pigs. N. C. Agr. Expt. Sta. Bull. 259, 12pp. Raleigh. 1928.
"There were two main objects in view at the time this work was begun. First, it was desired to compare soybean oil meal with fish meal as to its value as a protein supplement when fed with corn to fattening pigs. Second, data were needed with reference to the practicability of producing and fattening pigs, in the blackland section of the State, in numbers sufficient to make a car load or more." - p. 3.
1070. Humphrey, George C. Soy beans vs. middlings as a supplement to corn meal for fattening pigs. Wis. Agr. Expt. Sta. Rept. (1904) 21: 32-40; (1905) 22: 21-30; (1906) 23: 33-41. Madison, 1904-1906.
The third article is by George C. Humphrey and J. G. Fuller.
These are the reports of three trials, which are summarized as follows:
"Soy bean meal makes an excellent supplement to corn meal for growing and fattening pigs.
"Soy bean meal is from 8 to 10 per cent more valuable than wheat middlings for economical pork production when the cost of the two feeds is the same.
"Soy bean meal mixed with corn meal in the proportion of 1:2, produces greater gains than wheat middlings and corn meal fed in the same proportion.
"In feeding equal amounts of the two rations, soy beans and corn meal supply a slightly higher per cent of dry matter and digestible matter than wheat middlings and corn meal.
"For firmness, fine grain and texture of flesh, and even distribution of fat and lean, the ration of wheat middlings and corn meal is superior to that of soy beans and corn meal."

1071. Illinois Farmers' institute. The soy bean. Ill. Farmers' Inst. Ann. Rept. (1915) 20: 252-253. 4 I162
The value of the crop and costs of producing pork with soybeans are brought out.
1072. Jordan, Sam. The soy bean a husky ally. But you've got to know how to handle him. Country Gent. 83(28): 7. July 13, 1918. 6 C833
"A bunch of hogs so helped a man in Carroll County, Missouri, that his corn and soy beans made him \$104 an acre, the hogs doing a big part of the labor..."
The value of soybeans in farming is brought out.
1073. Kellner, O., and Neumann, R. Fütterungsversuche mit schweinen über die verdaulichkeit getrockneter kartoffeln und des entfetteten sojabohnenmehls. Landwirtschaftlichen Versuchs-Stationen 73(1-3): 235-240. 1910. 105.8 L23
The writer describes digestion experiments with swine using dried potatoes and fat-free soybean meal. The average digestion coefficients of each feed are given.
1074. Kelsey, Ray T. Will soys replace tankage? Purdue trials show economy of soybean ration. Ohio Farmer 152(15, whole no. 3945): 346. Oct. 13, 1923. 6 Oh3
Results of hog feeding tests made at Purdue University Experiment Station.
1075. Krueck, W. B. Soybeans with oil extracted produce quality pork. Grain & Feed Jours. Consolidated 69(10): 476. Nov. 23, 1932. 298.8 G762
Value and economy of using soybean oil meal for hogs.
1076. M., I. J. Hog grower's delight. Successful Farming 19(1): 88-89. January 1920. 6 Su12
The writer quotes J. M. Ballard's answers to his question as to how he liked soybeans.
1077. Martin, Edgar. Use of forage crops for growing and fattening swine. Ark. Agr. Expt. Sta. Bull. 321, 32pp. Fayetteville, 1935.
Literature cited, p. 32.
"Since available experimental data concerning the uses of forage crops as supplemental feeds were limited, work was begun in 1926 to determine the feeding value for swine. The pasture crops used in this experiment were blue grass, winter and spring oats, wheat, barley, rye, rape, turnips, soybeans, and cowpeas..."
1078. Mathews, I. J. Soybean facts for winter. Successful Farming 19(1): 26, 47. January 1920. 6 Su12
The writer describes soybeans as a "wonder crop" and discusses their place in the hog's ration.

1079. Mathews, I. J. Soybeans will balance the hog ration. Successful Farming 23(3): 70. March 1925. 6 Sul2
"The case being as above stated, there is no alibi now for sending expensively produced pork to market for want of protein to balance up the corn in the ration. Every farm upon which soybeans can be produced is capable of sending cheap pork to market."
1080. Miller, K. C. Soybeans feeding tests. Show varying results. Purdue Agr. 28(6): 47, 51. March 1934. 6 P97
This is a description of results obtained at the Purdue Experiment station in feeding soybeans to hogs, and of tests conducted in 1932-33 by the Purdue Experiment Station in cooperation with Kingan and Company of Indianapolis to "determine the effect of soybeans and soybean oilmeal on the quality of pork."
1081. Morison, A. T. Soy succotash for hogs. Country Gent. 82(47): 1846. Nov. 24, 1917. 6 C833
Methods used by Fayette county, Indiana, farmers in growing soybeans as a supplement to corn for hogs, and the results obtained are discussed.
1082. Mullen, Frank E. Soy beans in the Corn Belt. "Corn, soybeans and hogs" is a good slogan to assure more profit; a particularly successful combination for hogging-down purposes. Swine World 9(17): 7-8. April 1922. 46.8 Sw62
"...this article is intended primarily to show the value of soy beans in pork production."
1083. Results of tests at Ames. Soybeans in hog rations make soft pork. Wallaces' Farmer 60(4): 89. Feb. 16, 1935. 6 W15
"How to use soybeans and soybean oil meal in feeding market hogs was the main discussion in the Swine Feeders' Meeting held during the Iowa State College Farm and Home Week, February 4 to 8. The experiment conducted by C. C. Culbertson, B. H. Thomas, W. E. Hammond and F. J. Beard directed toward this end was the third year's work on this subject."
1084. Robison, W. L. Comparison of soybean oilmeals for supplementing corn for hogs. Ohio Agr. Expt. Sta. Monthly Bull. 9(9-10, whole nos. 105-106): 145-149. Wooster, September-October 1924.
"Because of the marked differences in results secured from feeding soybean oilmeal from different sources in various experiments, an experiment was conducted to determine the relative values of soybean oilmeals made by the processes described and to compare their worth with that of soybeans and tankage for supplementing corn." - p. 145.

1085. Robison, W. L. Cooking soybeans for hogs. Ohio Farmer 150(25, whole no. 3902): 652-653. Dec. 16, 1922.
The author refers to tests in feeding pigs made at the Ohio Agricultural Experiment Station.
1086. Robison, W. L. "Hogging" soybeans and corn. Breeder's Gaz. 87(21, whole no. 2267): 579. May 21, 1925. 49 B74
Tables show influence of soybeans in checked and in drilled corn on the yields secured.
1087. Robison, W. L. Soybean oilmeal as a feed for swine. Comparisons with soybeans, linseed oilmeal, and tankage. Ohio. Agr. Expt. Sta. Monthly Bull. 5(4, whole no. 52): 114-120. April 1920.
Includes the following tables the subject matter of which is discussed in the text: I. Tankage and soybeans as supplements to corn; II. Comparison of tankage, soybean oilmeal and ground soybeans for supplementing corn; III. Comparison of tankage, soybean oilmeal and soybeans as supplements to corn for self feeding in dry lot; IV. Comparison of Linseed oilmeal and soybean oilmeal for supplementing corn in dry lot feeding; V. Tankage, soybean oil meal and soybeans as supplements to corn for feeding on forage.
An abstract of this article is published under the title "Soybeans and soybean oilmeal for swine" in the Breeder's Gaz. 77(16, whole no. 2001): 1036-1037. April 15, 1920. 49 B74
1088. Robison, W. L. Soybean oilmeal as a protein. Method of oil extraction effects meal as hog feed. Ohio Farmer 155(6, whole no. 4014): 162-163. Feb. 7, 1925. 6 Oh3
Results of experiments in feeding soybean oilmeal to hogs at the Ohio Agricultural Experiment Station.
1089. Robison, W. L. Soybean, soybean oilmeal, and soft pork. Flour & Feed 36(6): 10-11. November 1935. 298.8 F66
A summary of experiments carried out chiefly by the Ohio Agricultural Experiment Station on the use of soybeans and soybean oilmeal in hog rations.
1090. Robison, W. L. Soybeans and soybean oilmeal as supplements to corn for hogs. Amer. Soc. Anim. Prod. Proc. (1921): 48-54. 389.9 An3R
"Soybeans doubtless deserve a place on a great many farms for some purposes, especially under certain soil and climatic conditions. For the feeding of hogs the beans themselves, however, are not an adequate supplement to corn and should not be relied upon to take the place of tankage or similar feeds. Soybean oilmeal, however, or beans from which the oil has been extracted, is a valuable source of protein."
1091. Robison, W. L. Soybeans and soybean oilmeal for pigs. Ohio Agr. Expt. Sta. Bull. 452, 42pp. Wooster, 1930.

The author discusses the results of experiments with soybeans "to determine their worth when fed in various ways and to secure information concerning methods of utilizing them advantageously as a feed for pigs." He includes numerous tables illustrating the results.

1092. Robison, W. L. Soybeans and soybean oilmeal for pigs. Cooked soybeans provide an efficient home-grown supplement when suitable minerals are supplied. Ohio Agr. Expt. Sta. Monthly Bull. 8(9-10, whole nos. 93-94): 149-153. Wooster, September-October 1923.
"Although Bulletin 349 and the Monthly Bulletin for April, 1920 as well as earlier publications issued by the Station contain reports of experiments in which soybeans were compared with other high-protein feeds as a supplement to corn for fattening pigs, increased production and a growing interest in the value of the crop for feeding purposes would seem to warrant a review of the findings of the early experiments and a presentation of the results of more recent trials, particularly those that suggest methods by which this crop may be utilized to better advantage." - p. 149.
1093. Robison, W. L. Soybeans for feeding hogs. Breeder's Gaz. 85(17, whole no. 2211): 524. Apr. 24, 1924. 49 B74
Results of experiments at the Ohio Experiment Station are briefly summarized, with emphasis on the financial aspects of the question.
1094. Robison, W. L. Soy beans for hogs. Pa. Stockman and Farmer 51(40): 858-859. Dec. 17, 1927. 6 N21
Gives the results of experiments in feeding soybeans to swine in various ways, mentions soybeans as a cause of soft pork, and suggests that "soy beans that are suitable for seed have always been worth more for that purpose than for swine feeding."
1095. Robison, W. L. Soybeans in corn for hogging-down. Prove less effective than tankage for supplementing standing corn. Ohio Agr. Expt. Sta. Monthly Bull. 9(5-6, whole no. 101-102): 75-80. Wooster, May-June 1924.
This is a summary of data obtained in experiments at the Ohio Experiment Station, Ohio State University, and the Missouri, Indiana and Iowa Experiment Stations.
1096. Robison, W. L. Supplements to corn for fattening swine. Ohio Agr. Expt. Sta. Bull. 349, pp. 131-183. Wooster, 1921.
The comparative feeding values of supplements, including soybeans, are reported.
1097. Roquemore, Everett E. Feeding whole soybeans causes soft pork. Grain & Feed Jours. Consolidated 71(2): 77. July 26, 1933. 298.8 G762
The great financial loss to farmers through soft pork due to feeding whole soybeans, is emphasized.

1098. Rowe, C. A. Pigs + corn + soybeans + clover = ? Ill. Farmers' Inst. Ann. Rept. (1912) 17: 367-369.
The talk is chiefly on the feeding of soybeans to hogs, the weight per acre of soybeans gained, and the best way of using the crop in hog feeding.
1099. Schmidt, J., Schleinitz, Frein v., and Lagncau, E. Versuche über den stickstoffansatz von wachsenden schweinen bei fütterung mit trockenhefe, sojaschrot und erdnusskuchenmehl. Biedermanns Zentralblatt, Abteilung B: Tierernährung 6(4-5): 281-291. September 1934. 389 B47T
Summary in English, p. 291.
"By metabolism trials with improved country pigs of 5 different stages of life the effect of dried yeast, ground soybeans and ground peanut cakes upon deposition of nitrogenium was examined..."
1100. Shrewsbury, Charles L., Vestal, Claude M., and Hauge, Sigfred M. Effect of yeast and casein supplements to corn and soybean rations when fed to rats and swine. U. S. Dept. Agr. Jour. Agr. Research 44(3): 267-274. Washington, D. C., Feb. 1, 1932. 1 Ag84J
"Literature cited", p. 274.
1101. Shrewsbury, Charles L., and Vestal, Claude M. The nutritive value and mineral deficiencies of soybeans. Ind. Agr. Expt. Sta. Bull. 420, 25pp. Lafayette, 1937.
Bibliography, p. 25.
"This report deals with certain nutritive properties of soybeans and soybean oil meal as determined by feeding experiments with swine and rats."
1102. Simpson, F. M. Soft pork from the market standpoint. Amer. Soc. Anim. Prod. Proc. (1931) 24: 289-291. 1932. 389.9 Am3R
"These records [kept by Swift and Co.] show at some plants a very large increase in the amount of soft pork. We believe this is due in great part - we do not know how much - to soybeans..."
1103. Skinner, J. H. Soy beans, middlings and tankage, as supplemental feeds in pork production. Ind. Agr. Expt. Sta. Bull. 108, pp. 13-32. Lafayette, 1905.
The objects of the test were: 1. "to determine the value of soy beans as a supplement to corn in pork production and to encourage farmers to grow their own protein for hogs. 2. To compare soy beans with middlings and tankage as supplements to corn, and add new data to previous experiments with these feeds. 3. To emphasize again the deficiency of corn as a sole ration for pork production and point out more economical methods of feeding and utilizing corn."
1104. Skinner, J. H., and Cochel, W. A. Supplements to corn for fattening hogs in dry lot. Ind. Agr. Expt. Sta. Bull. 126, pp. 141-159. Lafayette, 1908.

Part II. A comparison of soy bean meal and linseed meal. In these tests it was found that "corn meal and soy bean meal proved to be a more efficient ration in the tests reported than corn meal and linseed meal, both as regards the rate and cost of gains." A table, p. 159, summarizes the experiments to determine the relative value of linseed meal and soybean meal.

1105. Smith, William C. Soy bean in the Corn Belt. It's the gilt-edge insurance of profits from pigs. Country Gent. 87(12): 4. Apr. 29, 1922. 6 C833
"This is one of a series of articles...for the purpose of suggesting to farmers ways of increasing their income." - Note.
The author feels that "for the next few years the solution of the Corn Belt farmer's financial troubles will be found in the hog...But fed with corn alone he is not the money-maker he is when corn supplemented with feeds that furnish the protein is fed.
"Experiments prove that soy beans and rape are the supplements..."
1106. Soy beans versus rape with corn. Wallaces' Farmer 48(19): 725. May 11, 1923. 6 W15
This is a report of the experiments made in 1922 by the Ohio Experiment Station comparing soybeans with rape for hogging down with corn. W. L. Robison was in charge of the experiments.
1107. Spillman, W. J. A successful hog and seed-corn farm. U. S. Dept. Agr. Farmers' Bull. 272, 16pp. Washington, D. C., 1906. 1 Ag84F
A passage, p. 13, points out that an acre of soybeans will produce 600 pounds' increase in live weight of hogs.
1108. Suzuki, Kozo. [Soy-bean cake for the fattening of swine.] Agr. Chem. Soc. Japan Jour. 6(11, whole no. 74): 975-986. November 1930. J385 Ag8
"Soy-bean oil cake as 20 and 30% was added to a feed consisting of korean 47, maize 30, bone powder 2 and NaCl 1%. The nutritive value of the feed with soy-bean oil cake was as good as that with fish meal. The results in fattening were rather superior. Vitamin A, Cl, Na and Ca should be supplied." - Chem. Abs. 25(12): 3036. June 20, 1931.
1109. Thompson, Arthur T. Why soybeans make flabby bacon. Wallaces' Farmer 56(33): 925, 929. Aug. 15, 1931. 6 W15
This article is a discussion of the results of experiments brought out in Ill. Agr. Expt. Sta. Bull. 366: "Effect of soybeans and soybean oil meal on quality of pork", and feeding trials at other state experiment stations. The writer concludes that "if corn belt men continue to grow soybeans and if they wish to use beans to advantage as hog feed, then it seems that their best bet is soybean oil meal. Those who persist in feeding whole or ground soybeans to fattening hogs are headed for trouble."

1110. Tomhave, A. E. Soybeans as a protein supplement to corn for fattening pigs on forage. Del. Agr. Expt. Sta. Bull. 170, 23pp. Newark, 1931.
Bibliography, pp. 22-23.
Gives the results of four experiments conducted from 1926 to 1929.
1111. Tomhave, A. E. Wheat and soybeans as a feed for swine. Amer. Soc. Anim. Prod. Proc. (1932) 25: 131-133. 1933. 389.9 Am3R
"For three years there have been tests in progress at the Delaware Experiment Station to determine the value of wheat and soybeans as a feed for fattening hogs. The results obtained from the trials conducted during the past two years will be presented here."
1112. Union of South Africa. Department of agriculture. Cowpeas versus soya beans for pigs. Union So. Africa Dept. Agr. Jour. 7(1): 13-14. July 1923. 24 Un3
Gives the results of a feeding trial at Cedara. Superior results were obtained from soybeans.
1113. Vestal, Claude M., and Shrewsbury, Charles L. The effect of soybeans, soybean oil meal, and tankage on the quality of pork. Ind. Agr. Expt. Sta. Bull. 400, 47pp. Lafayette, 1935.
"The quality of either fresh or cured pork from hogs fed corn and soybeans may be as satisfactory as that from similar hogs fed corn and tankage, or corn and soybean oil meal, provided certain definite restrictions are placed on the feeding of the soybeans...
"If the above precautions are not taken in the feeding of soybeans, hog raisers are liable to produce pork that is unsatisfactory both to the packer and to the consumer."
1114. Vestal, Claude M., and Shrewsbury, Charles L. The effects of soybeans and soybean products on pork quality. Amer. Soc. Anim. Prod. Proc. (1933) 26: 151-154. 1934. 389.9 Am3R
References cited, p. 154.
"The purpose of this paper is to present the results of some recent experiments at the Purdue Station on the effects of soybeans and soybean oil meal on the quality of pork."
1115. Vestal, Claude M., and Shrewsbury, Charles L. The nutritive value of soybeans with preliminary observations on the quality of pork produced. Amer. Soc. Anim. Prod. Proc. (1932) 25: 127-130. 1933. 389.9 Am3R
"The nutritive value of cooked and roasted soybeans was superior to raw soybeans in combination with yellow corn and minerals for rats and swine. 2. Soybeans whether raw, cooked, or roasted had a definite softening effect on the carcasses of hogs. 3. The quality of the cured and smoked hams and bacons from hogs fed soybeans was satisfactory from the commercial standpoint." - Summary, p. 130.

1116. Vestal, Claude M. Soft pork - cornbelt. Amer. Soc. Anim. Prod. Proc. 1925-26: 75-77. 1927. 389.9 Am3R
Soybeans are cited as a reason for soft pork in the Corn Belt, and soft pork studies in that section are said to rightly center around them.
1117. Vestal, Claude M. Soybean and mineral supplements for fattening hogs. Swine World 10(3): 18, 19. Sept. 5, 1922. 46.8 Sw62
Gives the results of feeding trials at Purdue University.
This is a progress report. Similar tests are to follow.
1118. Vestal, Claude M. Soybeans as a substitute for tankage in fattening spring pigs on legume pasture. Ind. Agr. Expt. Sta. Bull. 341, 14pp. Lafayette, 1930.
"Will soybeans prove as valuable as tankage in fattening spring pigs for early market? In 1922, a series of experiments was begun with the purpose of obtaining an answer to this question. The description and results of these experiments, covering six consecutive years, are given in this bulletin."
Supplementary report on feeding soybeans to hogs, pp. 11-14. It is concluded that "soybeans should be used more extensively in rations for fattening hogs to conserve the tankage, fish meal, milk and other protein-rich feeds for the brood sows and young growing pigs. If this recommendation were followed throughout the corn belt, the problem of obtaining an adequate supply of cheap protein concentrates would be less acute and production costs would be lower for the swine industry."
1119. Weaver, L. A. Hogging down corn and soybeans. Mo. Agr. Expt. Sta. Bull. 224, 20pp. Columbia, 1924.
"This bulletin reports a five-year investigation of the pork producing value of corn and soybeans planted together and hogged down. The harvesting of duplicate plots also made it possible to compute the yield of corn and beans consumed in each lot. The combination produced more pork per acre than corn alone but not so much as corn supplemented with tankage. A mineral mixture was added to the corn and soybeans in one year's feeding test and gave results superior to those from corn and soybeans not thus supplemented, but still inferior to the results from corn, soybeans and tankage." - Abstract, p. 3.
1120. Weaver, L. A. Soybeans and soybean oil meal in swine rations. Mo. Agr. Expt. Sta. Bull. 266, 20pp. Columbia, 1929.
"This bulletin reports the results of two investigations made with a view of finding methods of feeding which will give maximum returns from the use of soybeans and soybean oil meal when used to supplement corn fed fattening hogs on pasture..." - Abstract, p. 3.
1121. Zeller, J. H., and Hankins, O. G. Pork of good quality grown efficiently on corn-soybean ration. U. S. Dept. Agr. Yearbook, 1934, pp. 290-292. Washington, D. C., 1934. 1 Ag84Y

"In cooperation with the Purdue (Ind.) University Agricultural Experiment Station, the Department has conducted a series of tests to determine the maximum proportion of soybeans that may be fed to hogs with corn without serious detriment to the quality of carcass."

Horses and Mules

1122. Belden, L. A. Soybean hay for horses. Purdue Agr. 23(7): 168, 180-181. April 1929. 6 F97

Article based on a bulletin published by the University of Illinois "containing the experience and opinions of farmers who were successfully feeding soybeans to horses and mules."

"The entire problem summarized indicates that soybean hay, corn and oats makes satisfactory feed for farm work horses. Soybean straw is an excellent roughage for wintering idle horses and mules. No bad results from feeding soybeans in any form were reported by any of the farmers questioned."

1123. Crawford, C. W., and Edmonds, J. L. Soybeans for horses and mules. Ill. Agr. Expt. Sta. Circ. 276, 8pp. Urbana, 1924.

"A number of farmers in central Illinois have found rations of soybean hay and corn or soybean hay, corn, and oats to be very satisfactory for feeding work horses... Soybean straw has been found to be a very satisfactory roughage for wintering idle work horses and mules...A small amount of beans fed in the spring seemed to aid in getting a horse's hair smooth and sleek. Soybean hay has been found to be an excellent roughage for fattening mules. Mules fed on this hay finished with exceptionally smooth coats of hair. Fattening mules also gained well on soybean pasture..." - Summary, p. 2.

1124. Edmonds, J. L., and Crawford, C. W. Soybean hay and sweet-clover pasture for growing purebred draft fillies. Ill. Agr. Expt. Sta. Bull. 292, pp. 485-500. Urbana, 1927.

"The results of this experiment indicate that soybean hay when properly supplemented is a satisfactory roughage for growing draft fillies. In fact, a comparison with previous experiments indicates that it is equal to alfalfa for this purpose..."

1125. Listovnich, U. I., and Gului, M. F. [Nitrogen metabolism in soybean feeding of horses.] Ukrain's'kiĭ Biochemichniĭ Zhurnal Jour. 7(1): 153-161. 1934.

In Russian. Summary in English.

Not examined.

"A soybean diet leads to an increased nitrogen metabolism..." - Chem. Abs. 29(14): 4804. July 20, 1935.

Poultry

1126. Babcock, Sidney H., Jr., and Jukes, Thomas H. Beneficial effect of non-saponifiable fraction of soy bean oil on chicks fed a simplified diet. Soc. Expt. Biol. and Med. Proc. 36(5): 720-721. June 1937. 442.9 Sol
The non-saponifiable fraction of soybean oil was found to give protection against "nutritional encephalomalacia."
1127. Byerly, T. C., Titus, H. W., Ellis, N. R., and Nestler, R. B. Effects of light, soybean and other diet supplements on seasonal hatchability and egg production. Poultry Sci. 16(5): 322-330. September 1937. 47.8 Am33P
References, p. 330.
It is stated among the conclusions that "Expeller process soybean meal made from the Illini soybean is deficient in some factor necessary for hatchability...
"These results indicate that the Illini bean may be intermediate in deficiency between the highly unsatisfactory Mammoth Yellow variety and the fairly adequate Wilson variety used in former experiments."
1128. [Coombes, A. I., Elvehjen, C. A., Phillips, P. H., and Hart, E. B.] Soybean oil prevents one type of chick paralysis. Wis. Agr. Expt. Sta. Ann. Rept. (1937, Pt. 1) 54: 8. Madison (Bull. 439)
Soybean oil has been found to be excellent protection against the form of chick paralysis called encephalomalacia.
1129. Delmas, F. Alimentation des volailles avec la farine de soja. La Vie Agricole et Rurale 23(13): 237-238. April 1, 1934. 14 V67
Bibliography, p. 238.
This is the result of feeding experiments on poultry with soy meal.
1130. Gutowska, M. S., and Drescher, I. [Comparative nutritive values of soybean meal and meat and bone meal of Polish origin in the starting ration of chicks.] Polish Agr. and Forestry. Ann. 36: 115-125. 1936. 20.5 R59
English Abstract, p. 126.
Not examined.
1131. Hayward, J. W., Halpin, J. G., Holmes, C. E., Bohstedt, G., and Hart, E. B. Soybean oil meal prepared at different temperatures as a feed for poultry. Poultry Sci. 16(1): 3-14. January 1937. 47.8 Am33P
"These studies were made possible by a fellowship supported by Allied Mills, Inc., Chicago, Ill...Published with the permission of the Director of the Wisconsin Agricultural Experiment Station." -
Note.
References, p. 14.
Gives the results of two series of feeding experiments.

1132. Horvath, A. A. Changes in hen's blood produced by a diet of sprouted soy beans. Amer. Jour. Physiol. 94(1): 65-68. July 1, 1930.
447.8 An3
Bibliography, pp. 67-68.
Results of blood tests after hens were fed sprouted soybeans for a period of forty days. Clotting ability, uric acid content, gout symptoms, and globulin: albumin ratio of the blood serum, are noted.
1133. Hunter, J. E. Soy meal and gluten meal for turkeys. Grain & Feed Jours. Consolidated 75(9): 385-386. Nov. 13, 1935. 298.8 G762
Address before Pennsylvania Millers and Feed Dealers Association.
Feeding experiments at Pennsylvania State College.
1134. Indiana. Agricultural experiment station. Thirty-fifth annual report of the Purdue University Agricultural Experiment Station...for the year ending June 30, 1922. 67pp. Lafayette, 1922.
In a brief report, pp. 39-40, entitled "Can soybean oil meal be substituted for tankage?" the results of tests used in feeding poultry are given.
1135. Kaupp, B. F. The value of soybean meal as a feed for chicks. Poultry Item 21(9): 6-7. July 1919. 47.8 P8625
This is a summary of the results of feeding experiments conducted during 1916 at the Coastal Branch Experimental Plant (North Carolina Experiment Station).
1136. Kennard, D. C., Holder, R. C., and White, P. S. The utilization of soy bean and corn proteins, as affected by suitable mineral supplements. Amer. Jour. Physiol. 59(1): 298-309. Feb. 1, 1922.
447.8 An3
Bibliography, p. 309.
"The purpose of the present investigation is to ascertain the value of soy bean meal as a constituent of poultry rations with a view to the practical application of the findings to the needs of the poultry fattening industry. The study deals with the following questions: Is soy bean meal deficient in mineral matter to such an extent as to affect its feeding value; if so, what is the most efficient way of overcoming it, and what effect does it have on the assimilation of protein and the storage of fat."
1137. Kennard, D. C. Vegetable proteins in poultry. Flour & Feed 36(6): 18-19. November 1935. 298.8 F66
In this article are traced the various tests made in the use of vegetable proteins for poultry feeding. The writer indicates that of the sources of vegetable protein possible in poultry feeding, "none seem to equal soybean oilmeal." He mentions its use in replacing meat scraps or fish meal, and gives the following reasons for its limited use: "(1) the price of soybean oilmeal on

a protein basis has generally been equal to or greater than that of meat scraps or tankage; (2) soybean oil meal was not generally readily available until very recently."

1138. Philips, Allen G. Feeding soy bean oil meal to laying pullets. A preliminary report, issued by Purdue university shows that the vegetable protein in soy bean oil meal can be utilized to excellent advantage by laying fowls if proper mineral salts are added. Reliable Poultry Jour. 30(4): 435. June 1923. 47 R272P
Results of three experiments starting October 5, 1920, and incomplete at the time of this report.
1139. Philips, Allen G., Carr, R. H., and Kennard, D. C. Meat scraps versus soybean proteins as a supplement to corn for growing chicks. U. S. Dept. Agr. Jour. Agr. Research 18(7): 391-398. Washington, D. C., Jan. 2, 1920. 1 Ag84J
"The object of this experiment was to determine the value of corn protein in the growth of chicks when the proteins were fortified with sufficient ash and with fat-soluble vitamins, as compared with their value when supplemented by varying amounts of proteins derived from meat scraps or soybean meal or from these proteins in combination."
1140. Philips, Allen G., and Hauge, Sigfred M. Soy bean oil meal in rations for laying pullets. Ind. Agr. Expt. Sta. Bull. 293, 20pp. Lafayette, 1925.
Bibliography, p. 20.
"Cereal grains as the sole constituents of the ration for laying pullets are unsatisfactory. This is true because of deficiencies in protein and mineral. The addition of protein in concentrates from animal sources, such as tankage, meat scraps, etc., greatly enhance the value of rations because they possess proteins of high biological value and are also rich in minerals. However, the increasing demand for such supplements will soon exceed the supply. It is therefore desirable to have highly efficient protein supplements from other sources. It has been found that soybeans or their by-product, soybean oil meal, will give practically the same results as these animal proteins when the ration is properly supplemented with minerals."
1141. Prentice, J. H., and Baskett, R. G. The role of separated milk, soya bean meal and minerals in the nutrition of the chick. Northern Ireland. Min. Agr. Jour. 3: 12-28. Belfast, 1931. 10 N81J
1142. Sloan, H. J. Soybeans for poultry. Grain & Feed Jours. Consolidated 75(10): 429. Nov. 27, 1935. 298.8 G762
The value of the oil meal as a protein supplement, the need for supplying the mineral deficiency, the advantage of oil meal over the beans, the use of soybean hay for poultry, and suggested poultry rations for use with soybean oil meal, are considered.

1143. Suzuki, Kozo. Digestion experiment of soy bean cake and kaoliang with poultry. Agr. Chem. Soc. Japan Bull. 7(9-12): 82-84. September-December 1931. 385 Ag8B
The writer describes digestion trials with 2-year old White Leghorn cocks at the Imperial Zootechnical Experiment Station, Chiba. Digestion coefficients with both soybean cake and kaoliang are given.
1144. Suzuki, Kozo, and Hatano, Tadashi. [Nutritive value of soy-bean cake for hens. II.] Agr. Chem. Soc. Japan. Jour. 6(10, whole no. 73): 900-909. October 1930. 385 Ag8
"Soy-bean oil cake was given as protein source of the feed. Twelve parts of bone powder, 4 parts of CaCO_3 and 4 parts of NaCl for 100 parts of the cake were supplied. The nutritive value was similar to that of fish meal. It gives results on egg production and wt. of egg similar to those of other animal feeds. III. Ibid 910-6. - The chicks hatched from the eggs as above mentioned were also fed with soy-bean oil cake. No abnormal signs were noted." - Chem. Abs. 25(12): 3036. June 20, 1931.
1145. Suzuki, Kozo, and Hatano, Tadashi. Soya bean cake as protein supplement of poultry feed. World's Poultry Cong.Proc.(1930)4: 288-291. London, 1931. Libr. Cong. SF481.W7 1930
Discussion follows reading of the paper, pp. 290-291.
"The fact that it [soybean cake] possesses as much feeding value as fish meal protein, when used as protein supplement in poultry feed in conjunction with proper quantities of calcium, sodium and chlorine, has been ascertained by various experiments, as follows..."
Also published (without discussion) under title "Soy Bean Cake as a Protein Supplement of Poultry Feed" in U. S. Egg and Poultry Mag. 36(12): 34-35. December 1930. 286.85 Ag3
1146. Tomhave, A. E., and Mumford, C. W. Effect of ground soybeans on the cold storage quality of eggs. Poultry Sci. 12(1): 37-41. January 1933. 47.8 Am33P
References, p. 41.
Summary of results of an experiment carried out with Single Comb White Leghorns at the Delaware Agricultural Experiment Station.
1147. Tomhave, A. E., and Mumford, C. W. Ground soybeans as a protein supplement for growing chicks. Del. Agr. Expt. Sta. Bull. 183, 24pp. Newark, 1933.
"The soybean, a concentrate containing on the average 36 per cent protein is extensively grown in Delaware, and provides a relatively cheap source of protein to the poultrymen of the State provided it is suitable for poultry feeding. It was to determine the value of ground soybeans as a protein concentrate in chick rations that the following experiments were conducted."

1148. Tomhave, A. E., and Mumford, C. W. Ground soybeans as a supplement for laying birds. Del. Agr. Expt. Sta. Bull. 197, 37pp. Newark, 1936.

References, p. 37.

Gives the results of six experiments in feeding.

1149. Wilgus, H. S., Jr., Norris, L. C., and Heuser, G. F. Effect of heat on nutritive value of soy-bean meal. Indus. and Engin. Chem. 28(5): 586-588. May 1936. 381 J825

"Literature cited", p. 588.

"Soy-bean oil meals which are satisfactory as sources of high-quality protein for feeding poultry may be produced by the expeller, hydraulic, and solvent processes, by the application of a sufficient amount of heat. The optimum temperature found in this study for the expeller method was 140° to 150° C. for two minutes in the expeller, and for the hydraulic method was 105° C. for 90 minutes in the cooker. A solvent process meal produced at 82° C. for 15 minutes (the usual commercial procedure) was excellent in protein efficiency.

"The vitamin G content of the soy beans studied was low and was not affected to any measurable extent by the manufacturing processes. The color and flavor of the meals were not infallible criteria of their nutritive value, but a raw, beany flavor was indicative of an insufficient application of heat and a resulting inferior protein efficiency." - Abstract, p. 587.

Sheep and Lambs

1150. Evvard, John M., Culbertson, C. C., Hammond, W. E., and Hennes, K. K. Soybean hay for fattening lambs. Iowa Agr. Expt. Sta. Bull. 234, pp. [153]-183. Ames, 1926.

"This publication is to be considered as a progress report, the intention being to do further work on this subject as soon as facilities are available."

"With the collaboration of Q. W. Wallace."

This study is in two parts: the first giving an historical summary of the previous work done in soybean hay feeding, and the second giving an account of the authors' experiments in feeding soybean hay to fattening lambs. The objects of the experiment were to find out the relative values of red clover hay, whole soybean hay and ground soybean hay for fattening lambs; to study the effect of feeding the concentrate allowance mixed with ground soybean hay; and to note the effect of the various rations on feed consumption, gains, water consumption, feed requirement, market finish, market value, shrinkage in shipping and character of carcasses."

1151. Evvard, John M. Soybean hay for the breeding ewes. Amer. Soc. Anim. Prod. Proc. (1923): 88-93. 1924. 389.9 Am3R
"With the collaboration of Russell Dunn and C. C. Culbertson."
"In order to determine just how good this feed is for ewes, and how it compares with alfalfa hay, we carried out the following experiment."
1152. Hamilton, T. S., Mitchell, H. H., and Kammlade, W. G. The digestibility and metabolizable energy of soybean products for sheep. Ill. Agr. Expt. Sta. Bull. 303, pp. 237-295. Urbana, 1928.
"The investigations reported herein were undertaken...in order to determine the digestibility and metabolizable energy of soybean hay, soybean straw, whole soybeans, and soybean oil meal. In order to obviate what was thought to be one of the greatest faults with most previous investigations along these lines, that is, the use of too few experimental animals, it was decided to determine the digestibility and metabolizable energy for each feed on each of 12 sheep, a number three times as large as has heretofore been used in any single digestion experiment with soybean products."
1153. Hammond, W. E., Evvard, John M., and Culbertson, C. C. Soybean and alfalfa hays for wintering pregnant ewes. Iowa Agr. Expt. Sta. Bull. 282, pp. 241-256. Ames, 1931.
This report gives the results of experiments in feeding four lots of the ewes on soybean and alfalfa hays and on certain combinations of these two hays.
1154. Humphrey, George C., and Kleinheinz, Frank. The value of soy beans in grain rations for lambs. Wis. Agr. Expt. Sta. Rept. (1904) 21: 51-55; (1905) 22: 65-68. Madison, [1904-1905.]
These are reports of two trials which "show that soy beans are an economical supplement to corn for grains with sheep both in body weight and wool production. The increase in wool produced was 13.8 pounds, which sold for thirty cents per pound, increasing the profits by \$4.14."
1155. Kammlade, W. G., and Mackey, A. K. The soybean crop for fattening western lambs. Ill. Agr. Expt. Sta. Bull. 260, pp. 197-211. Urbana, 1925.
"The two experiments reported in this bulletin were undertaken to determine the usefulness of soybean hay, soybean straw, whole soybeans, ground soybeans, and soybean oil meal when fed with shelled corn, for fattening western lambs."
1156. Kammlade, W. G. Soybeans for fattening lambs. Breeder's Gaz. 83(25, whole no. 2167): 848. June 21, 1923. 49 B74
"Shelled corn and soybean straw or hullings, supplemented with whole soybeans, ground soybeans, soybean oilmeal or linseed oilmeal, were used in fattening four lots of western lambs at the Illinois Experiment Station..."

1157. Liebscher, W., and Liebscher, K. [Nutritive value of soybean silage.]
Landeskult. Wien 1: 214-217. 1934.
Not examined.
"Feeding trials with sheep are recorded..." - Chem. Abs. 31(20):
7554. Oct. 20, 1937.
1158. Lindsey, J. B. Digestion experiments with sheep. Mass. Hatch Agr.
Expt. Sta. Ann. Rept. (1903) 16: 63-79. Boston, 1904. (Public
Doc. 33)
A table giving data for the sheep fed on soybean meal is
shown, p. 72; and the results discussed for the soybean meal
feeding test, p. 78.
1159. Miller, John I., Morrison, F. B., and Maynard, L. A. Relative ef-
ficiency for growing lambs of the protein in rations supplemented
by soybean-oil meal, linseed meal, or corn-gluten meal. U. S.
Dept. Agr. Jour. Agr. Research 54(6): 437-448. Washington, D. C.,
March 15, 1937. 1 Ag84J
"...This paper is part of a thesis presented by John I. Miller
to the Graduate School of Cornell University in partial fulfill-
ment of the requirements for the degree of doctor of philosophy." -
Note.
"The results obtained in these two series of experiments
with growing lambs indicate that soybean-oil meal, linseed meal,
and corn-gluten meal have the same efficiency as supplements to
a low-protein basal ration of corn and timothy hay or a ration
of corn and corn stover insofar as the protein utilization of
the total ration is concerned."
1160. Richards, W. B., and Kleinheinz, Frank. The value of soy beans as a
part of a grain ration for lambs. Wis. Agr. Expt. Sta. Rept.
(1904) 21: 51-55. Madison, Democrat print. co., State printer, 1904.
"The object of this experiment was to compare the feeding value
of soy beans with oats fed as an adjunct to corn."
1161. Ruffner, R. H. Soy bean hay versus alfalfa hay for winter maintenance
of sheep. N. C. Agr. Expt. Sta. Ann. Rept. (1927) 50: 48-50.
Raleigh [1928].
Feeding experiments.
1162. Turk, Kenneth L., Morrison, F. B., and Maynard, L. A. The nutritive
value of the proteins of corn-gluten meal, linseed meal, and
soybean-oil meal. U. S. Dept. Agr. Jour. Agr. Research 51(5):
401-412. Washington, D. C., Sept. 1, 1935. 1 Ag84J
Literature cited, pp. 411-412.
"These data show the superiority of soybean-oil meal over those
furnished by linseed meal and corn-gluten meal. Furthermore, they
indicate that it is possible to measure differences in quality of
protein using sheep and the nitrogen-balance type of experimenta-
tion."

Food Uses

1163. Adolph, William Henry, and Wu, G. M. Additional notes on soy-bean products. Natl. Med. Jour. China 6: 231-233. 1920.
Not examined.
1164. Adolph, William Henry, and Wang, Ying-Lai. The digestibility of the protein of soybean milk. Chinese Jour. Physiol. 8(2): 171-178. May 15, 1934. 447.8 C44
Literature, p. 178.
"Ten-day digestion experiments with albino rats were used to determine the apparent digestibility. The protein of soybean milk and the protein of cow milk were found to have a digestibility of 84.9 percent and 86.6 percent respectively."
1165. Adolph, William Henry. A 4000-year food experiment. Sci. Amer. 143(6): 425-428. December 1930. 470 Sci25
In this article the food needs of the Orient are compared with those of America, and the important place of soybeans in the economy of China is brought out. Reference is made to the meaning China's food habits may have for this country.
1166. Adolph, William Henry, and Kao, Hsueh-chung. Hemoglobin-building properties of soy bean products. Chinese Jour. Physiol. 6(3): 257-263. Aug. 15, 1932. 447.8 C44
"(From the Department of Chemistry, Yenching University, Peiping.)"
Literature, p. 262.
"Curative experiments on rats rendered anemic on an exclusive diet of cow's milk demonstrate that soy bean meal, soy bean cheese, and soy bean milk are effective in the regeneration of hemoglobin. Analyses of these food materials indicate that they contain appreciable amounts of iron and copper." - Summary, p. 262.
1167. Adolph, William Henry. How China uses the soy bean as food. Jour. Home Econ. 14(2): 63-69. February 1922. 321.8 J82
The paper "is a summary of some studies which have been made in the Shantung Christian University laboratory on soy bean products", and has for its purpose the calling of attention to the numerous forms in which oriental people have long used the bean. It is suggested that many of these dishes are well worth adoption in the United States.
1168. Adolph, William Henry, and Kiang, P. C. Nutritive value of soy-bean products. Natl. Med. Jour. China 6: 40-49. 1920.
Not examined.

1169. Adolph, William Henry, and Chen, Shen-Chao. The utilization of calcium in soy bean diets. Jour. Nutrition 5(4): 379-385. July 1932. 389.8 J82
References, p. 385.
"The experiments here reported were planned for the purpose of determining the extent to which an adult can utilize the calcium of soy bean curd."
1170. Adriano, F. T., Oliveros, S. B., Santos, D. S., and Villanueva, E. R. The physical characteristics and chemical composition of various brands of toyo (soy sauce) sold in the Philippines. Philippine Jour. Agr. 5(3): 171-186. 1934. 25 P543
References, p. 186.
Gives methods of manufacture of soy sauce, and an analysis of twenty-one samples.
1171. Allen, Paul W. Industrial fermentations. 424pp. New York, The Chemical catalog co., inc., 1926. 390 A15
"References" at end of most chapters.
Ch. 14. Soy-Bean Sauce Manufacture, pp. 123-127. The chapter is chiefly a series of quotations from M. Church of the United States Department of Agriculture, on the preparation of soy sauce and the possibilities for the industry in the United States. Other authorities are cited on the industrial applications of the fungus used in soy sauce.
1172. Andrović, Edwino. Studi teorici e pratici sull'olio di semi di cotone e di semi di soya. Pt. 1. 52pp. Zara, Stab. Tip. di Spiridione Artale, 1923. 307 An22
"R. Università degli studi - Roma."
Olio di Semi di Soya, pp. 42-52. The writer, in this section, brings out his work in producing an edible oil or fat from the soybean for the Gudahy Packing Co. of Omaha. He describes the chemical qualities of the oil, the processes used in refining it, and the use for the refined product in cooking and in the canning industry.
1173. Annen, H. Die sojabohne. Das mühlenlaboratorium v. 3, no. 9, columns 159-167. Sept. 7, 1933. (Suppl. to 298.8 M89. Filed in Dr. Fellows' office, BAE)
A discussion of the value of the soybean as a food and its use in baking.
1174. Bailey, L. H., Capen, R. G., and LeClerc, J. A. The composition and characteristics of soybeans, soybean fleur, and soybean bread. Cereal Chem. 12(5): 441-472. September 1935. 59.8 C33
"Food Research Division Contribution No. 242."
"Literature cited", pp. 470-472.
This study takes up the following topics: acreage, production, and price of soybeans in the United States; uses for soybeans; the

chemical composition of the beans; processes for removing the bitter taste of the beans; extraction of soybean oil; chemical composition of the soybean flour; the food value of the flour and its use in baking.

1175. Balland. Le soja dans l'alimentation française. Paris. Académie des sciences Comptes Rendus 164, 1^{er} sem. (7): 300-302. Feb. 12, 1917. 505 P21
"Descriptions and analyses are given of some soy-bean products used in France. Among those used in the army are canned raw soy beans, canned soy-bean soup, whole beans, soy-bean flour, and war bread and biscuit made with soy-bean and wheat flours." - Expt. Sta. Rec. 37(2): 164-165. August, 1917.
1176. Bardet. Sur un pain sans matières amylacées à base de soja hispida. Bulletin Général de Thérapeutique Médicale, Chirurgicale, Obstétricale et Pharmaceutique 149(5): 181-184. 1905. Army Medical Library.
Paper presented at the session of January 25, 1905, of the Société de Thérapeutique.
Discussion, pp. 183-184.
A description and analysis of bread made with soybean flour, and an indication of its value for diabetics.
1177. Becker, Christian. Soja bei eitrigen harninfektionen, ekzem und diabetes. Archiv für Verdauungs-Krankheiten, Stoffwechselfathologie und Diätetik 56(5-6): 260-278. November 1934. Army Medical Library
"Literatur", p. 278.
The use of a soybean diet in treating purulent urinary infections, eczema and diabetes.
1178. Berczeller, Lázló. Arbeiten über das Berczeller'sche sojamehl. hefts I-III, processed. Wien, 1928-1930. 389 B453
Three volumes bound in one; paged variously.
This is a compilation of articles reprinted from various sources on the soybean flour invented by Berczeller.
Partial contents: Heft I, 1928. Die Bedeutung der Soja für die Volksernährung, by L. Berczeller, 6pp. (The importance of the soybean in human nutrition. Reprinted from Therapie, 1927.); La Farine de Soja, by Jean Freud, 4pp. (Soy flour. An extract from La Presse Médicale, no. 6, Jan. 19, 1927.); Das Sojamehl als Nahrungsmittel, by H. Wastl, 7pp. (Soy flour as food. Appeared in "der Wiener Medizinischen Wochenschrift", no. 41, 1926.); The Use of the Soy Bean in Human Nutrition, by T. R. Parsons, 4pp. (Reprinted from The Lancet, p. 267. Jan. 29, 1927.); The Advantages of Growing Soya Bean in Ireland, by D. T. Barry and J. Freud. (Taken from the Farmers' Gazette, p. 297, March 5, 1927. Includes discussion of soybean flour.); Das haltbare Sojamehl, by H. Wastl, 3pp. (The stable soy flour. Taken from Die Mühle, no. 34, 1927.); Berczeller's Soya Flour. An Economic Aspect of the Alimentary

Problemen, by John Freud, 3pp.; Das Sojamehl in der Diät der Zuckerkranken, by Josef Szanto, 3pp. (Soy flour in the diet of diabetics. Translation from the Hungarian. Reprinted from *Therapia*, January 1928.); Die Aufgaben der Sozialpolitik bei der Einführung des Sojamehles, by P. Frankfurter, 9pp. (The introduction of soy flour in relation to social policy. Includes a comparison of the food value of soy flour with other products.); Zum Problem der Uebervölkerung, by Fritz Löw, 2pp. (Soy flour in its relation to the problem of over-population.); Die Bedeutung des Berczeller'schen Sojamehles für die Nahrungsmittelindustrie, by Wilhelm Gerö, 3pp. (The uses to which soy flour may be put in the food industry.); Die Verwendung des Berczeller'schen Sojamehles für die Brotbereitung, by P. Frankfurter, 5pp. (The use of soy flour in bread making.); Das Berczeller'sche Sojamehl vom bäckereitechnischen Standpunkt, by Viktor F. A. Richter. I. Brot, 5pp. II. Teil: Milchbrot, Gebäck, Zuckerbäckereien und Backhilfsmittel, 4pp. (Part I and II of an article on Berczeller's soy flour from the technical point of view in baking. The first part discusses its use in bread making, and the second takes up its use in milk bread, pastry, confectionery, and self-raising flour.).

1178a. Heft II. 1929. Integriamo la "Battaglia del Grano", by Enzo Giasotto, 3pp. (An extract from *Echi e Commenti*, no. 31. Nov. 5, 1926. Discusses the food value of soy flour and its importance to Italy.); Zur Einführung des Berczeller'schen Sojamehles in Italien, by A. Kramer, 8pp. (Includes a general section on the importance of the soybean and soy flour.); Ueber die Verwendung des Berczeller'schen Sojamehle in Kriege, by L. Dionfeld, 5pp. (On the use of soy flour in war time.); Haltbares Sojamehl, by Ernst Kupelwieser, [3]pp. (The food value and relative cheapness of soy flour are discussed.); White Bread versus Brown Bread or the Bread of To-Morrow, by Victor F. A. Richter, 6pp. (Reprinted from *Year Book of the Scottish Association of Master Bakers 1929*, p. 115. Mentions the increased food value of bread when soy flour is added to it.).

1178b. Heft III. 1930. The Technology of Breadmaking and the Dr. Berczeller's New Soyflour, by Victor F. A. Richter. I. Bread, 4pp. II. Milkbread, rolls, smallgoods, pastries, etc., 7pp. (This is a translation of the article in Heft I: Das Berczeller'sche Sojamehl vom bäckereitechnischen Standpunkt.); Edelsonja. Was jede Hausfrau von diesen neuen Nahrungsmittel wissen sollte, by Hertha Sprung, 3pp. (A discussion of the nutritive value of the new soy flour. Reprint from *Die Oesterreicherin* I. Jahrgang, nr. 8, Oct. 1, 1928.); Flour Production. Soja Beans and a New Process, by Fabian White, 3pp. (Reprinted from *Industrial World*, 1929. The importance and food value of the flour are described.); Soya Products, by Dr. Cronshaw, 1p. (Extract from "The Food Manufacture" January 1929. Briefly mentions the uses for the new soy flour.);

Soya Flour, 2pp. (Reprinted from Food Manufacture, February 1929.); The Dr. Berczeller's soya flour in the Vienna and continental bakery, by Victor F. A. Richter, 7pp. (Recipes.); Soya Bean Flour. Its Value to the British Confectioner, by W. P. Ford, 4pp. (Reprinted from Confectionery Craft, August 1929.); Die Bedeutung des Berczeller'schen Sojamehles für Grossbritannien, by H. Prinz, 7pp. (This is a study of the importance of the soy flour to Great Britain, but contains a section on the characteristics and food value of the flour.)

Einige Gutachten über das Berczeller'sche Sojamehl. (See note under "Expert opinions on the Berczeller soy flour", which is a translation of this.)

1178c.

Bound in with these publications is an additional set of papers on the flour taken from periodicals and newspapers, including: Edelsoja und das Konditorgewerbe, 5pp. (Reprinted from Der Konditor, no. 33, Nov. 20, 1928. Soy flour in the pastry industry.); Die Edelsoja - ein neues Nahrungsmittel, 11pp. (Reprinted from the Linzer Tagblatt, Nov. 11, 1928. Soy flour as a food.); Die Edelsoja. Ein neues Nahrungsmittel, 2pp. (Appeared "im Neuen Wiener Tagblatt", Dec. 1, 1928. Abstracts of talks given at a session of the Bund Österreichischer Frauenvereine on the value of soy flour.); Die Edelsoja, pp. 1-3. (Appeared "in der Neuen Freien Presse", Dec. 5, 1928. Outlines the value of soy flour and speeches made at the session of the Bund Österreichischer Frauenvereine.).

Das ernährungsphysiologische Laboratorium in Wien, by L. Berczeller, 11pp., describes the founding of the Laboratory and lists the publications which have appeared as a result of its work.

1179. Berczeller, László. Ueber die biologische wertung der nahrungsmittel. Wiener Klinische Wochenschrift 34(42): 507-511; (43): 524-525; (44): 536-538. Oct. 20-Nov. 3, 1921. Army Medical Library

Includes, p. 525, a summary of results of experiments to ascertain the biological value of soybean flour as food.

1180. Berczeller, László. Die untersuchung des sojamehles. Biochemische Zeitschrift 129(3-4): 313-319. May 3, 1922. 384 B522
Soybean meal as used in nutrition studies with rats.

1181. Bloch, A. Quelques mots sur la fabrication et la composition du Teou-fou (fromage de haricots chinois fourni par le soja hispida). Bulletin des Sciences Pharmacologiques tome 13, 8^e année, no. 3, pp. 138-143. March 1906. Army Medical Library.

Description of the manufacture and composition of tofu, or Chinese soybean cheese.

1182. Bogatskii, V. D., Storozhuk, M. K., and Muromtsev, V. A. Technologie der herstellung und methoden der desodorierung der sojamilch. Moscow. Zentrales Biochemisches Forschungs-Institut der Nahrungs- und Genussmittelindustrie, Schriften 2(9): 410-430. 1933.
389.9 M85
Article in Russian with alternate titles and summary in German. Commercial preparation and methods of deodorization of soy milk. "Detailed directions are given for prepg. and grinding soy beans, emulsifying, boiling and deodorizing by blowing with hot air..." - Abstract by Julian F. Smith in Chem. Abs. 27(21): 5438. Nov. 10, 1933. 381 Am33C
1183. Bowers, W. G. Some studies on the nutritive value of the soy bean in the human diet. N. Dak. Agr. Expt. Sta. Food Dept. Spec. Bull. 5(13): 278-328. August 1919.
"A thesis presented for the degree of Doctor of Philosophy to the Faculty of the Ohio State University."
Bibliography, pp. 325-327.
Extent of production, pp. 278-280; Human food preparation made from the soy bean, pp. 280-281; Character of the carbohydrates of the soy bean and its bearing on nutrition, pp. 282-283; Character of the fats of the soy bean and its bearing on nutrition, p. 283; Character of the protein and its bearing on nutrition, pp. 283-284; Vitamines of the soy bean, pp. 284-285; Minerals of the soy bean, pp. 285-286; The soy bean compared to some other legumes used as human food as to fuel value and organic nutrients, p. 286; Digestibility of soy bean products, pp. 286-287; Experimental part, pp. 287-319. ("In our experimental work we propose to inquire into the digestibility of soy cake meal. We shall then determine the digestibility of the different carbohydrates as found in a representative variety of the soy bean. After passing some of the beans thru a milling process we shall study the composition and digestibility of the meal and bran and determine their relative amounts of calcium and phosphorus, and locate any possible poisons or objectionable substances that may be present in either of these. This will make it possible, then, to determine whether or not it would be profitable to carry on the milling process and eliminate certain products, or whether by the use of certain extractives we can get rid of the objectionable constituents."); Discussion of results, pp. 319-323; Summary, pp. 323-324.
1184. [Buchanan, A. E., Jr.] Soybean flour. Sci. Amer. 149(1): 28-29. July 1933. 470 Sci25
This is a very brief account of the soybean flour "Nusoy" and its uses.
1185. Bugby, William. Soy beans as human food. Veg. Messenger and Health Rev. (ser. 8, 63d year) 8(3): 83-84. March 1911. Libr. Cong. TX392.A4
"The true economy...is to use the Soy bean itself direct, as a perfect and superior substitute for flesh meat."

1186. Campbell, Mabel. The soy bean - a little known legume. R. I. State Bd. Health Bull. 3(3): 46-49. July 1917. 449.9 R34B
The food value of the bean is described and recipes are given.
1187. Cappelli, Giuseppe. Sul panè con soia e di soia. Lo Sperimentale 81(4): 546-557. Oct. 14, 1927. Army Medical Library.
A study of results obtained in breadmaking tests in which various proportions of wheat and soy flour were used.
1188. Carles, P. Le lait végétal. Répertoire de Pharmacie, 63^e année, 3^e série, tome 19, no. 11, pp. 487-488. Nov. 10, 1907. Libr. Cong. RSI.R4
Characteristics and value of vegetable milk made from soybeans.
1189. Carnean, Mrs. Thora M. And now - soybean flour. Farmers' Elevator Guide 28(3): 31. March 1933. 280.28 Am3
Food value of the flour, method of using it, and recipes are included.
1190. Castagnol, E. M. Etude sur la fabrication du lait de soja. Bulletin Economique de l'Indochine 37: 982-994. September-October 1934. 22.5 In2
The writer takes up the method of preparation of soybean milk, the chemical composition of the soybean, the amount of product obtained at various stages of the preparation, ability of soybean milk to ferment, and the problems arising in the home manufacture of the milk, and the production on a large or small scale for sale.
1191. Cates, J. Sidney. Soy beans go domestic. Country Gent. 103(2): 6, 58. February 1933. 6 C833
The discovery of new green-vegetable varieties for human consumption, and the importance of soybeans as a source of protein are taken up.
1192. Chang, Ke-Chung, and Tso, Ernest. A soluble soybean milk powder and its adaptation to infant feeding. Chinese Jour. Physiol. 5(2): 199-203. May 15, 1931. 447.8 C44
Literature, p. 202.
"A spray process on an experimental scale is described for the drying of soybean milk. The powder exhibits similar physical properties as powdered cow's milk. With the addition of certain supplementary foods, test feeding on one infant for a period of 84 days was completely successful." - Summary, p. 202.
1193. Chen, Chac-Yu. A comparison of the nutritive value of beef, egg white and dried soybean curd with reference to Vitamin B. Natl. Univ. Peiping Col. Agr. Nutrition Bull. 4: 1-11. 1937.
Not examined.

1194. Ch'en, Shen-Chao, and Adolph, William H. Bone building potency of soy bean diets. Chinese Jour. Physiol. 6(1): 59-62. Feb. 15, 1932. 447.8 C44
"Read before the Fifth Annual Meeting of the Chinese Physiological Society...at Peiping, February 16-18, 1931."
"In connection with our interest in the use of soy bean milk in nutrition, experiments were projected for the purpose of evaluating the bone building properties of soy bean products and comparing them with cows' milk."
1195. Chevalier, J. Pains de soja et de gluten pour diabétiques. Bulletin Général de Thérapeutique Médicale, Chirurgicale, Obstétricale et Pharmaceutique 157(22): 845-846. 1909. Army Medical Library
Paper presented before the session of the Société de Thérapeutique, May 26, 1909.
Describes the value of soy bread and gluten bread for diabetics.
1196. Chiu, Yan-Tsz. Analyses of Chinese foods. II. Determination of pentosans in soybeans and soybean milk. Lingnan Sci. Jour. 11(1): 1-3. January 1932. 22.5 C16
Selected references, p. 3.
"It is found that the amount of pentosans present in the milk varies with the filter used in making the milk and also the size of the bean particles ground in the mill..."
1197. Chiu, Yan-Tsz. Suggested improvements in the manufacture of soy bean milk. Lingnan Sci. Jour. 8: 573-576. December 1929. 22.5 C15
Bibliography, pp. 575-576.
Changes in methods of manufacture in order to remove the unpleasant taste and odor of the milk, and the addition of other nutritious ingredients and flavor are discussed.
1198. Church, Margaret B. Soy and related fermentations. U. S. Dept. Agr. Dept. Bull. 1152, 27pp. Washington, D. C., 1923. 1 Ag84B
Bibliography, pp. 25-26.
An account chiefly of the making of soy sauce in Oriental countries, and the possible manufacture and use of the product in the United States.
1199. College of agriculture and mechanic arts of University of Porto Rico, Mayaguez. Cooking qualities of soybeans. Puerto Rico Agr. Expt. Sta. Rept. 1936: 84. San Juan, P. R., 1937.
Under "Cooking tests" the following statement is made: "Dry seed of the edible varieties tested was sent to the office of the Home Demonstration Work of the Agriculture Extension Service of the University of Puerto Rico to study their culinary qualities."

1200. Collin, Eug. La graine, la poudre et le tourteau de soja. Annales des Falsifications 3(15): 19-24. January 1910. 389.8 An72
This is a chemical study of the soybean. Reference is made to food products made from it, and its history in France.
1201. Concepcion, Isabelo. The greater significance of soy bean in the Filipino dietary. Philippine Islands Med. Assoc. Jour. 12(3): 97-106. March 1932. Army Medical Library.
"Read in the Symposium on Nutrition...Manila Medical Society on January 25, 1932."
"With a well-laid-out campaign to promote the intelligent use of soy beans, it is probable that inside of ten years the food and population problem will be well out of the way for centuries to come."
1202. Costa, Domenico. Sulla panificazione con le farine di estrazione di soia. Annali di Chimica Applicata 17(11): 524-530. November 1917. 385 An7
The efforts made at various times to use the soy for national feeding in Italy, are outlined. It is pointed out that Government reduction of grain imports has stimulated studies for the use of soy flour in bread making. A chemical analysis of soy flour, and the types of bread produced in various tests are given.
1203. Coville, Frederick V. Soybean cheese. Science (n.s.) 70(1812): 282-283. Sept. 20, 1929. 470 Sci2
Description of soybean cheese and its making.
1204. Dacy, George H. Cheap foods from soy beans. Country Gent. 82(19): 863. May 12, 1917. 6 C833
"A soy-bean substitute is available for nearly every ordinary dish on the average menu."
1205. Daniels, Amy L., and Nichols, Nell B. The nutritive value of the soy bean. Jour. Biol. Chem. 32(1): 91-102. October 1917. 381 J824
The writers give the results of feeding experiments on rats.
1206. Demolon, A. Lait végétal? Journal d'Agriculture Pratique (n.s.) 21(5): 140-141. Feb. 2, 1911. 14 J82
This is a response to an article in the Journal by Mr. Li-Yu-Ying. The author takes up the question of whether this product of the soy can properly be called "milk." He discusses the differences in composition between natural milk and soy (vegetable) milk. The article is written from the viewpoint of the use of the milk for France.
1207. Dietz, R. Die bedeutung des sojamehls als backhilfsmittel bei weizenmehlen. Das mühlenlaboratorium, v. 3, no. 12, columns 209-214. Dec. 7, 1933. (Suppl. to 298.8 M89. Filed in Dr. Fellows' office, BAE)

Gives the results of baking tests to discover the value of soybean flour as a supplement to wheat flour.

1208. Dittes, Frances L. The soy bean as human food. *Tenn. Acad. Sci. Jour.* 8(3): 323-328. July 1933. 500 T25A

"Read before the Tennessee Academy of Science at the Nashville meeting, November 27, 1931."

Bibliography, p. 328.

Food products from soybeans and their value as food. The writer concludes:

"Thus, there are significant reasons for expecting that the soy bean will become one of our most stable and prominent sources of fat and protein. There are reasons to expect also that the United States will become the leader in introducing the soy bean in the daily diet of the white race."

1209. Dox, Arthur W. Experiments with soy bean meal as a substitute in the army ration. *Iowa Acad. Sci. Proc.* (1918) 25: 517-519. Des Moines, 1918. 500 Io93

Favorable tests in the use of soy meal and soybean flour in bread in army camps.

1210. Ducceschi, V. La farina di soja nella alimentazione umana. *Archivio di Fisiologia* 25(3): 428-468. July-September 1927. Army Medical Library.

Bibliografia, pp. 466-467.

An account of research conducted to determine the nutritive value of soybean flour when mixed with wheat flour in bread making, and in other preparations.

Abstract by Grimme in *Chemisches Zentralblatt* 99(band 2) (1): 115. July 4, 1928, under title "Sojamehl in der menschlichen Ernährung."

A shorter account of these experiments is to be found in the author's articles of the same title in *Società Italiana di Biologia Sperimentale Bollettino* 2(3): 279-282; (5): 478-479. June 12, Sept. 6, 1927. 442.8 Sol2

1211. Ducceschi, V. Osservazioni relative alla nota del Dott. Romolo Venturi sulla utilizzazione della soja per l'alimentazione umana. *Biochimica e Terapia Sperimentale* 14(12): 400-402. Dec. 31, 1927. 385 B52

These are remarks on the note of Venturi on the utilization of the soybean as human food.

1212. Durkee, M. M. Soybean oil in the food industry. *Indus. and Engin. Chem.* 28(8): 898-903. August 1936. 381 J825

"Symposium on the Chemistry and Technology of Soybeans, Presented before the Division of Agricultural and Food Chemistry at the 91st Meeting of the American Chemical Society, Kansas City, Mo., April 13 to 17, 1936."

"Literature cited", p. 903.

Methods of extracting the oil, its composition, steps taken in refining the oil, trade channels for the oil, special types of oil used in certain foods such as salad oil, margarines and vegetable shortenings are discussed. The problem of reversion of the oil after refining is brought out and the need for research is emphasized.

Abstract in "The Utilization of Soya Beans". Chem. Age [London] 34 (880): 417-418. May 9, 1936. 382 C427

1213. Edible soya flour. Food Manfr. 6(11): 334-335. November 1931. 389.8 F736

This is a very brief account of the soy flour (Soyelk) and the trade outlets and uses for it.

1214. Elsdon, G. D. The chemistry and examination of edible oils and fats, their substitutes and adulterants. 521pp. London, Ernest Benn, Ltd., 1926. 307 E17

Ch. XI, Soya-Bean Oil, pp. 188-195. Quotations are made from various writers on the uses of the plant (Toch), the commercial uses and methods for obtaining oil and protein (Satow), chemical composition of the oil, composition of hydrogenated oil, and the nature of "soy" and "saké" oils and of soybean miso oil. Additional references are grouped at the end of the article. The references in the article are from the Journal of the Society of Chemical Industry.

1215. Evvard, John M. Soybeans for flour. Grain & Feed Jours. Consolidated 74(2): 57. Jan. 23, 1935. 298.8 G762

The numerous uses for the flour and its value in nutrition are pointed out.

1216. Expert opinions on the Berczeller soy flour. various paging, processed. Wien, Fritz Löw [1928?] 389 Ex (Pam. Coll.)

Contains letters in translation from Dr. Schwicker Alfred, Dr. Stefan Weiser and Roszony, on soybean flour; an article by A. Durig, "The Soy as a Foodstuff", 3pp., 1926 (Emphasizing its importance if it can be supplied in an appetizing way); and analyses of the flour by Dr. Helene Wastl, and Dr. Ernst Kupelwieser. "The Publications on Berczeller Soy Flour" are given at the end.

This same pamphlet in German is bound in Berczeller, Lázló. Arbeiten über das Berczeller'sche Sojamehl. 389 B452

1217. Ferrée, C. J. The properties of processed soya. Food 5(59): 442-443. August 1936. 389.8 F738

A defense of soy flour in bread making, in reply to the article by Dr. Drake Law in the April issue of Food.

1218. Ferrée, C. J. The soya bean and the new soya flour; revised translation from the Dutch by C. J. Ferrée and J. T. Tussaud. 79pp. London, William Heinemann (medical books) ltd., 1929. 60.3 F41 Bibliography, pp. 78-79.

"In the following pages the writer has endeavoured to give an account of the numerous uses to which the soya bean has so far been put, and to visualise its future service to humanity through the means of a totally new and practical process by which this legume...may in future be used as an important article of food for general consumption throughout every quarter of the globe.

"In compiling the details relative to the soya bean flour, with which this brief summary principally deals, he trusts that he has succeeded in giving sufficient data to enable the reader to fully realise its value as a staple food from the economic point of view, as well as from the more domestic standpoint, so that the important fact may be fully realised that a new foodstuff of a very valuable nature...has now been brought within the reach of all nations to serve them in a most practical manner as an economic article of food." - Preface.

The book includes statistical material on the imports and exports of soybeans, soybean oil and cake in various countries.

1219. Fiehe, J. Über sojabohnen und sojabohnenbrot. Zeitschrift für Untersuchungen der Nahrungs- und Genussmittel 49(1-2): 45-51. January-February 1925. 384 Z39

A discussion of the food value of the soybean and of the composition and value of soybean bread.

1220. Field, Ada M., Alexander, Beulah H., and Sylvanus, Ethel B. Soy-bean paste as an emulsifying agent. Science (n.s.) 77(1986): 91. Jan. 20, 1933. 470 Sci2

"Soy-bean paste as emulsifying agent in salad dressing has several merits. Among these are: (1) low cost, (2) ease of shipping and storing the beans, (3) heat sterilization of paste immediately before use, (4) the incorporation of rather a large volume of liquid for a given viscosity..."

1221. Frey, Charles N., Schultz, A. S., and Light, R. F. The effect of active soybean on vitamin A. Indus. and Engin. Chem. 28(11): 1254. November 1936. 381 J825

"The effect of the decolorization of carotene by ground soybeans on its vitamin A potency was studied."

1222. Friedenwald, Julius, and Ruräh, John. The use of the soy bean as a food in diabetes. Amer. Jour. Med. Sci. 140(6, whole no. 465): 793-803. December 1910. 448.8 Am3

The results of studies by the authors bring out the following conclusions: "(1) The soy bean is a valuable addition to the dietary of the diabetic on account of its palatability, and the numerous ways in which it can be prepared. (2) The soy bean in

some way causes a reduction in the percentage and total quantity of sugar passed in diabetic subjects on the usual dietary restrictions."

1223. Geerligs, H. C. Prinsen. Über die anwendung von enzymwirkungen in der Ostasiatischen hausindustrie. Zeitschrift für Angewandte Chemie, Wirtschaftlicher Teil 30(37): 256-257. May 8, 1917. 384 Z33
This paper was read before the Niederländische Chemische Vereinigung, General session in the Hague, Dec. 28, 1916.
The paper is on the domestic application of enzyme actions in Eastern countries, and describes, among other things, the making of fermented soybean food products.
1224. Gibbs, H. D., and Agcaoili, F. Soja-bean curd, an important Oriental food product. Philippine Jour. Sci. 7, Sec. A.(1): 47-51. February 1912. 475 P53
The authors discuss chemical analyses of soybeans, method of manufacture of the curd around Manila, and adulteration of the product in the locality.
1225. Gill, Augustus H., and Ma, Yu M. The hydrogenation of soybean oil. Oil and Fat Indus. 5(12): 348-351. December 1928. 307.8 J82
"Experimental investigation of its application to lard-substitute production."
1226. Gironcoli, Ugo de. Contributo clinico alle ricerche sul contenuto di fattore A negli oli vegetali. La Pediatria [Naples] 34(24): 1333-1348. Dec. 15, 1926. Army Medical Library.
Bibliografia, p. 1348.
An account of clinical studies made with infants from which conclusions were drawn as to the vitamin A content of soybean and olive oil.
1227. Goldberger, Joseph, Wheeler, G. A., Lillie, R. D., and Rogers, L. M. A study of the blacktongue preventive action of 16 foodstuffs, with special reference to the identity of blacktongue of dogs and pellagra of man. U. S. Treasury Dept. Pub. Health Repts. 43(23): 1385-1454. Washington, D. C., June 8, 1928. 151.65 P96
References, pp. 1448-1449.
Soy bean, pp. 1400-1402.
1228. Goldberger, Joseph, and Tanner, W. F. A study of the pellagra-preventive action of dried beans, casein, dried milk, and brewers' yeast, with a consideration of the essential preventive factors involved. U. S. Treasury Dept. Pub. Health Repts. 40(1): 54-80. Washington, D. C., Jan. 9, 1925. 151.65 P96
References, p. 80.
Trials with soybeans in a pellagra-preventive diet, pp. 55-59.

1229. Grinne, Clemens. Die sojabohne und ihre verarbeitung zu nahrungs- und gemusmitteln. Konservenz-Zeitung 15(1): 1-3; (2): 10-11. Jan. 2-9, 1914. 389.8 K83
"Data are presented regarding the manufacture, characteristics, composition, and uses of soy bean milk, soy bean cheese (curd), soy bean bread, soy sauce, and other products." - Expt. Sta. Rec. 31: 66. 1914.
1230. Hanauer. Neues von den medizinaldrogen. Schweizerische Wochenschrift für Chemie und Pharmazie 51(31): 453-455. Aug. 2, 1913. 396.8 Sch9
"The soy bean is recommended as nourishing food, and in cases of diabetes and inflammation of the kidneys." - Chem. Abs. 7: 4044. October-December 1913.
1231. Hansen, Louis A. The soy bean as human food. Life and Health 48(2): 21-23, 27. February 1933. Libr. Cong. RA773.L6
In this article are given the history of the bean, its value as a food, and its uses as flour, milk and soy sauce. Reference is made to the findings of American scientists.
Also in Jamaica Agr. Soc. Jour. 37(3): 147-151. March 1933. 8 J8223
1232. Hardenburg, E. V. The soybean as human food. Market Growers Jour. 43(9): 716. Nov. 1, 1928. 6 M34
The limited food use of the soybean in this country as compared with the Orient, is ascribed to the competition of the better-known navy bean. The dry and green soybeans are said to be found mainly in the markets of large cities. Various foods made from soybeans are cited, and the composition of navy bean and soybean seed are compared in a table.
1233. Hayward, J. W., Steenbock, H., and Bohstedt, G. The effect of cystine and casein supplements upon the nutritive value of the protein of raw and heated soybeans. Jour. Nutrition 12(3): 275-283. Sept. 10, 1936. 389.8 J82
Literature cited, pp. 282-283.
"The primary objective of these experiments was to demonstrate if the beneficial effect of heat was exerted on the protein fraction only or whether the digestibility and ability of other constituents of soy beans were likewise improved."
1234. Hayward, J. W., Steenbock, H., and Bohstedt, G. The effect of heat as used in the extraction of soy bean oil upon the nutritive value of the protein of soy bean oil meal. Jour. Nutrition 11(3): 219-234. March 1936. 389.8 J82
"This research was made possible by a fellowship supported by Allied Mills, Inc., Chicago, Illinois...Published with the permission of the director of the Wisconsin Agricultural Experiment Station, Madison."
"Literature cited", pp. 233-234.

"Raw soy beans were found to contain protein of low nutritive value as determined by the grams of growth per gram of protein eaten. Commercial soy bean oil meals such as the expeller meal processed at low temperatures, 105° C. for 2 minutes or the hydraulic meal cooked at 82° C. for 90 minutes contained proteins similar in nutritive value to the raw soy beans. On the other hand, commercial soy bean oil meals which had been prepared at medium and high temperatures such as expeller meals processed at 112 to 130 and 140 to 150° C. for 2 1/2 minutes or hydraulic meals cooked at 105 and 121° C. for 90 minutes contained proteins which had about twice the nutritive value of the raw soy beans or low temperature meals..." - Summary, p. 231.

The experiments were conducted with rats.

1235. Hentze, G. Praktische versuche über einige verwendungsmöglichkeiten von pflanzenlecithin (phosphatide). Zeitschrift für Ernährung 1: 53-61. 1931. 389.8 Z32
"Com. lecithin obtained by the Bollmann method (C.A. 17,3234) from soy beans consists of 60 lecithin and 40% fat. The plant product has the same chem. and phys. properties as that from eggs and is cheaper. It is possible to use this soy lecithin in place of egg yolk in baking. Five tablespoonfuls of a 20% soln. correspond to 1 egg." - Chem. Abs. 25: 2780. May-August 10, 1931.
1236. Hepburn, Joseph Samuel, Sohn, Keun Sung, and Devlin, Laurence Patrick. Biochemical studies of soybean milk and chicken protein. Jour. Franklin Inst. 217(2): 213-221. February 1934. 470 J82
"Soy bean milk", pp. 213-217, gives results of feeding tests on albino rats, showing that soybean milk had about the same protein content as cow's milk, that other nutrient compounds were present to a lesser extent, that it curdled at a lower acidity than cow's milk, and that, in feeding, the ration containing soybean milk produced gain in weight less rapidly and with less efficiency than that containing cow's milk.
1237. Hepburn, Joseph S., and Sohn, Keun Sung. Do fu: an oriental food. Amer. Jour. Pharm. 102(10): 570. October 1930. 396.8 Am3
This is a soybean preparation.
1238. Hill, Lewis Webb, and Stuart, Harold C. A soy bean food preparation for feeding infants with milk idiosyncrasy. Amer. Med. Assoc. Jour. 93(13): 985-987. Sept. 28, 1929. 448.9 Am37
Gives the result of feeding infants upon a soybean formula.
1239. Holmes, Arthur D. Digestibility of protein supplied by soy-bean and peanut press-cake flours. U. S. Dept. Agr. Bull. 717, 28pp. Washington, D. C.; 1918. 1 Ag84B
It is concluded that "the data obtained in this and other investigations give sufficient evidence to justify the belief that

soy-bean and peanut flours, rich in proteins that are well digested and of high biologic value, should prove especially valuable additions to the human dietary."

There is an abstract of this paper in Internatl. Inst. Agr. Internatl. Rev. Sci. and Pract. Agr. 10(7-9): 810-811. July-September 1919. 241 In82

1240. Holmes, Arthur D. Digestibility of some seed oils. U. S. Dept. Agr. Bull. 687, 20pp. Washington, D. C., 1918. 1 Ag84B
Soy-bean oil, pp. 6-9.

1241. Holmes, Arthur D. Digestibility of stean-cooked soy beans and peanuts. Amer. Med. Assoc. Jour. 74(12): 798-801. March 20, 1920. 448.9 Am37
"The results of this investigation, considered in connection with the previously reported data regarding the nutritive and biologic values of these two legumes, give evidence to justify the belief that soy beans and peanuts are expecially valuable for human food, as compared with other legumes that have been studied with the same thoroughness."

1242. Hornemann, Curt. Über den vitamin Gehalt der sojabohne. Zeitschrift für Untersuchung der Nahrungs- und Genussmittel 49(3): 114-120. March 1925. 384 Z39

It is said in summary that, from the studies made, soybeans have been found to contain vitamin A, which is also present in the oil; that the soybean by-products, soyneal or cake, contain vitamin B; and that the proteins of soyneal and cake have been judged of high value when fed to rats.

1243. Horowitz-Wlassowa, L. M., Oberhard, I. A., and Gutermann, B. I. Ueber die zubereitung der sojanilch. Moscow. Zentrales Biochemisches Forschungs-Institut der Nahrungs- und Genussmittelindustrie. Schriften 1(5): 157-169. 1931. 389.9 M85

Text in Russian with alternate titles and summary in German.
Method of preparing soybean milk.

Abstract by Schönfeld in Chemisches Zentralblatt 103(band 2) (3): 1985. Sept. 28, 1932. 384 C42

1244. Horowitz-Wlassowa, L. M., and Livshitz, M. I. Ueber die zubereitung des kefirs und des kases aus der sojanilch. Moscow. Zentrales Biochemisches Forschungs-Institut der Nahrungs- und Genussmittelindustrie. Schriften 1(5): 170-174. 1931. 389.9 M85

Text in Russian with alternate titles and summary in German.
Method of preparation of "kephir" and cheese from soybean milk.

1245. Horvath, A. A. Acceptance of soya flour depends on correct processing. Food Indus. 7(1): 15-16. January 1935. 389.8 F737

"Improvements in process avoid a bean-flavored product, enhance keeping quality, and provide food manufacturers with an ingredient high in protein, rich in fat, and low in carbohydrates to complement starchy flours and supplement milk in food formulas." - Ed. note.

1246. Horvath, A. A. Changes in the blood composition of rabbits fed on raw soy beans. Jour. Biol. Chem. 68(2): 343-355. May 1926. 381 J824
Bibliography, p. 355.
1247. Horvath, A. A., and Chang, H. C. The effect of soybean feeding on the blood lipase of rabbits. Amer. Jour. Physiol. 78(1): 224-234. Sept. 1, 1926. 447.8 An3
Bibliography, p. 234.
"From the Department of Medicine, Peking Union Medical College, Peking, China."
Results of feeding experiments.
1248. Horvath, A. A., and Liu, Shin-Hao. The effect of soy sauce on blood sugar and phosphorus. Japan Med. World 7(4): 105-108. April 15, 1927. 448.8 J27
Bibliography, p. 108.
"1. In rabbits, subcutaneous injections of Taka-Diastase gives no definite results for conclusions, but seems to be capable of affecting the blood sugar in both directions. 2. In men the results of oral administration of soy sauce are varying and at present no definite conclusion concerning the effect of soy sauce on blood sugar and phosphorus can be drawn. But in some cases soy sauce seems to be capable of affecting the blood sugar and blood phosphatides." - Summary, p. 108.
1249. Horvath, A. A. Newer methods of refining soya oil preserve its food value. Food Indus. 7(8): 387-388. August 1935. 389.8 F737
References, p. 388.
A diagram illustrates the Bochn system of extracting soybean oil. The food value of the oil extracted by this method is described.
1250. Horvath, A. A. Some recent views about soya flour. 10pp. [1935?] Pan. Coll. 389 H
Bibliography, pp. 9-10.
The author quotes recent authorities in a discussion including the objectives of "processing" soybeans for the manufacture of edible flour, the quantity of lecithin, vitamins A and D and protein in the flour, its basic ash quality, alkaline influence and importance of these in the human diet.
1251. Horvath, A. A. Soya flour as a national food. Sci. Monthly 33: 251-260. September 1931. 470 Sci23
The writer feels that "it should take but a very short time for the use of soya meal to become universal since it has five times the calorific value, and two hundred times the fat value of potatoes. It should become a national food in every sense." He discusses the chemical make-up of the soybean, and studies with soybean flour that have been made.

Also published, in Spanish, under title "El Frijol 'Soya' como Alimento Nacional." Revista de Agricultura, Comercio y Trabajo [Cuba] 14(3): 43-56. September 1932. 8 Ag88Re

1252. Horvath, A. A. Soya flour is miller's best friend. Amer. Miller 63(10): 36-37. October 1935. 298.8 Am32

"From the presented data it is evident that the best way to sustain and promote the consumption of wheat in the United States consists in shifting the wheat products from the class of energy producing foods to a level of full value foods. This can be easily done by the incorporation of a certain percentage of whole soya flour into the existing wheat products, such as bread, macaroni, etc."

1253. Horvath, A. A. Soya flour; its manufacture and uses. Food Manfr. 10(8): 279-281. August 1935. 389.8 F736

Processing, the probable effect upon bread consumption of use of soy flour, the food value of soybean bread, soybean flour in beverages and other products, and its nutritive value, are discussed.

1254. Horvath, A. A. The soybean. Coop. Manager and Farmer 21(2): 38-40. October 1931. 280.8 C78

Address delivered at the laboratory of the Harshaw Chemical Company, Cleveland, Ohio, May 24, 1931.

The author describes the food value of the soybean and its oil, the utilization of the bean in milk and soy sauce, and the uses for soybean flour and oil. He concludes that the "Soybean is going to revolutionize nutrition."

1255. Horvath, A. A. The soy bean as human food. Indus. and Engin. Chem., News Ed. 9(9): 136. May 10, 1931. 381 J825

The writer gives the historical background of the soybean, its chemical properties and uses, and the growing interest in soybean preparations in different countries. He proposes the establishment of "a soya foundation in order to promote the creation of a national soya food research institute."

1256. Horvath, A. A. The soybean as human food. Ed. 2, 86pp. Shanghai, China Ministry of Industry, Commerce and Labor, Bur. of Industrial & Commercial Information [1926] (Booklet series no. 3) 280.9 C44 no. 3

Bibliography, pp. 85-86.

Partial contents: Preface, by Macey F. Deming [Address at a meeting of the National Soybean Growers' Association held at Washington, D. C., September, 1925.], pp. 1-5; General ingredients of the various Manchurian beans, pp. 9-15; Composition of some Japanese soybeans and of the common American varieties, p. 16; The value of the soybean as food, pp. 17-20; Soybean oil for food, pp. 21-25; Refined soybean oil, pp. 26-29; The whole soybean as food, pp. 30-38; Soybean cake, soybean meal and soybean flour for food, pp. 39-57; Soybean milk for food, pp. 58-71; Soybean curd

(tofu) for food, pp. 72-77; Fermented soybean products for food, pp. 78-83.

Also published as a series of articles in Chinese Economic Monthly 3(9): 392-400; (11): 513-518. September, November 1926. 269.1 C442

Continued in Chinese Economic Journal 1(1): 24-32; (2): 175-192; (3): 298-309; (4): 415-425. January-April 1927. 280.8 C442

1257. Horvath, A. A. Soybean feeding and blood calcium. Japan Med. World 8(1): 1-5. Jan. 15, 1928. 448.8 J27
Bibliography, pp. 4-5.
"...Raw cooked soybeans can restore a lowered blood calcium, caused by bleeding, in rabbits." - Summary, p. 4.
1258. Howe, H. E. A lesson from the Orient. Sci. Amer, 118(11): 230. March 16, 1918. 470 Sci25
The writer urges the planting of soybeans on southern farms where the boll weevil has made profitable cotton production impossible, and outlines some of the uses of the bean as food.
1259. Inghan, A. G. Soybean milk vs. milk. Hoard's Dairymen 82(3): 78. Feb. 10, 1937. 44.8 H65
The writer points out that "there is no possibility of making a complete substitute for cow's milk out of the soybean."
1260. Italy. Ministero della guerra. Direzione centrale di sanità militare. Commissione per lo studio della soia. Relazione generale a S.E. il Ministro... Giornale di Medicina Militare 75(5-6): 281-356. May 1-June 1927. Army Medical Library.
Part II, pp. 288-295, describes the composition of soybean seed and flour and the characteristics of bread made with it.
Part IV, pp. 302-307, describes experiments in nutrition.
Part VI, pp. 310-313, takes up the Berczeller soy flour and its composition and results in feeding it to human beings.
1261. Itani, Kungo, and Higashi, Saburo. [The antirachitic properties of "Okara" of soy beans.] Arbeiten aus der Medizinischen Universität Okayama 2: 566-571. 1931.
Not examined.
1262. Itano, Arao. Soy beans as human food. Mass. Agr. Expt. Sta. Bull. 182, 10pp. Amherst, 1918.
The writer discusses the uses as human food to which soybeans may be put, and the methods of preparing them. Those mentioned are soybean milk (Toniu), the various ways of preparing the beans as beans, ripened vegetable cheese (Miso), and soybean sauce (Shoyu).

1263. Ivanova, N. V. [Food value of soybeans. Vitamin A, proteins and salt composition.] *Voprosui Pitaniya (Problems of Nutrition)* 4(4): 135-142. 1935.
Not examined.
"Soybeans are so rich in vitamins that they can serve as the sole source of vitamins to growing rats. The proteins also have such a high biol. value that they can serve as the sole protein food..." - F.H.R. in *Chem. Abs.* 30(10): 3537. May 20, 1936. ..
1264. Izume, Seiichi, and Yoshimaru, Yoshinori. [Soy-bean oil cake as a food and its nutritive value. I. The oil extracting process and the digestion coefficient of the protein. II. The nutritive value of the alcohol-extracted bean oil cake.] *Agr. Chem. Soc. Japan. Jour.* 7(2, whole no. 77): 87-111. February 1931. J385 Ag8
1265. Izume, Seiichi, and Komatsubara, Isao. [Soy-bean oil cake as a food and its nutritive value. III. The effect of the addition of the soy-bean oil cake to other grain.] *Agr. Chem. Soc. Japan. Jour.* 7(2, whole no. 77): 111-120. February 1931. J385 Ag8
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1280. Kellogg, John Harvey. The new dietetics. A guide to scientific feeding in health and disease. Ed. 3, 1031pp., rev. Battle Creek, Mich., The Modern medicine pub. co., 1927. 389 K292 Ed. 3

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1283. Kishlar, Lamar. Some nutritive developments in soybean products. Oil & Soap 14(9): 237-239. September 1937. 307.8 J82
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Literature cited, pp. 540-542.
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Bibliography, p. 148.
Results of studies on growing albino rats to determine the constructive food value of soybeans. An exclusive diet of soybeans was found to be deficient in vitamins A and D, and in mineral salts.
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"Published by permission of the Commissiener of Internal Revenue."
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Methods of preparing soybean food products are given.
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References, p. 284.
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The writer gives a brief account of the progress and development of the soybean industry in the United States. The value of the soybean for human food and the fact that there are many ways of preparing the beans for use for food and drink are pointed out.
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The treatment of pyuria in infants with soybean diet and alternate treatment.

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1310. Miller, Carey D., and Robbins, Ruth C. Nutritive value of green immature soybeans. U. S. Dept. Agr. Jour. Agr. Research 49(2): 161-167. Washington, D. C.; July 15, 1934. 1 Ag84J
"Literature cited", p. 167.
"Two varieties of cooked green immature soybeans were analyzed for organic nutrients and for calcium, phosphorus, and iron.
"As compared with most vegetables, they had unusually large amounts of protein, fat, calcium, phosphorus, and iron.
"Cooked immature soybeans proved to be a very good source of vitamins A, B, and G and a poor source of vitamin C." - Summary, p. 167.
1311. Mitchell, H. H., and Smuts, D. B. Amino acid deficiencies of beef, wheat, corn, oats and soy beans for growth in the white rat. Jour. Biol. Chem. 95(1): 263-268. February 1932. 381 J824
Bibliography, p. 281.
"The amino acid deficiencies of the proteins of lean beef, wheat, oats, corn, and soy beans have been investigated, the paired feeding method being used...
"The proteins of lean beef and soy beans are biologically deficient in cystine..." - Summary and conclusions.
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Literature cited, p. 1011.
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April 14, 1921. Army Medical Library.

Soybean milk in feeding and in the treatment of gastro-enteritic illnesses in infants.

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The food value of natto (soybean cheese) as well as its preparation is explained.
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The advantages of soybeans over navy beans and ways of preparing them are described. The article is based in part on Ohio Agricultural Experiment Station Bulletin 312.
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"Vortrag, gehalten in der Berliner med. Gesellschaft am 10. Juli 1912."
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The food value and advantages of soybean milk over animal milk are discussed.
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"Vegetable Milk," Lit. Digest 46(10, whole no. 1194): 509-510. Mar. 8, 1913. Libr. Cong. AP2.L58, includes a quotation from this article by Dr. Neuville.

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Not examined.
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Literature cited, p. 178.
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This is a continuation of work begun in Yearbook 3, 1904. Brief mention is made of the importance and food value of the soybean as proved by experiments with rats.
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381 J824
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The high food value and inexpensiveness of soybeans are discussed. Ohio farmers are urged to plant them, to meet the demand for increased food production.
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References, p. 268.
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A study of the effect of nine different proteins on the rate of hemoglobin regeneration in nutritional anemia. Experiments were made on rats and mice. Soybean oilmeal was one of the proteins tested.
1334. Pian, Jina Hsueh-Chin. Biological value of the proteins of mung bean, peanut, and bean curd. *Chinese Jour. Physiol.* 4(4): 431-436. November 1930. 447.8 C44
"(From the Department of Biochemistry, Peiping Union Medical College, Peiping.)"
Literature, p. 433.

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[The nutrient value of edible fats and oils. I. The nutritive value of margarine and soybean oils.] Voprosui Pitaniya (Problems of Nutrition) 2(5): 34-60. 1933.
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"Feeding expts. on white rats in which margarine and soybean oil are compared with butter...are reported..." - Chem. Abs. 29(19): 6628. Oct. 10, 1935.
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Work done in Austria by various chemists in inventing processes for making soybean meal and milk for diabetics is summarized.
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5th year, vol. 5 forming vol. 6 of the series.
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Preparation of soybean milk, cheese and soy sauce are described.
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"In the present study, further evidence of the antirachitic potency of soybean egg powder will be presented, using as a criterion, the calcium and phosphorus retention of rats fed exclusively on the diet..."
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"(From the Division of Physiological Science, Henry Lester Institute of Medical Research, Shanghai.)"

Literature, p. 41.

The writer describes modifications in the method of preparing soybean-egg powder from that described in the Journal for March 15, 1934, and reports feeding experiments on rats.

1343. Reid, Eric. A preliminary report on the preparation of an infant food, a soybean milk - egg powder. Chinese Jour. Physiol. 8(1): 53-64. March 15, 1934. 447.8 C44

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"In the present investigation, the preparation of a soybean milk powder...will be reported. In addition, we shall present the results of our investigations on the digestibility of the powder, relative to that of cow's milk."

1344. Remy, E. Über sojabohnenmilch. Zeitschrift für Untersuchung der Nahrungs- und Genussmittel 43(12): 380-381. June 15, 1922. 384 Z39

"Mitteilung aus der Chemischen Abteilung des Hygienischen Instituts der Universität Freiburg."

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1345. Rhoad, A. O., and Carneiro, Geraldo G. Valor da soja moída para produção de leite. Boletim de Agricultura, Zootecnia e Veterinaria [Minas Geraes, Brazil.] 7(2): 69-78. February 1924. 9.2 M66
References, p. 78.

Results of experiments to test the value of soybeans for milk production.

1346. Rimini, Enrico. Il pane e le paste alimentari pei diabetici. Archivio di Farmacologia Sperimentale e Scienze Affini 1(1): 30-46; (2): 66-79. January-February 1902. Army Medical Library.

The second installment contains a section, pp. 66-70, on soybean bread as a food for diabetics.

1347. Rittinger, Fred. R., and Denbo, Leon H. Soy bean (vegetable) milk in infant feeding. A preliminary report. Amer. Jour. Diseases of Children 44(6): 1221-1238. December 1932. 443.8 J433

"We submit, in this preliminary communication, the results on a series of fifty infants fed soy bean milk...Our observations cover a period of one year..."

1348. Roberts, Lydia J., and Miller, Elizabeth W. A cheap homemade soy-bean meal for diabetics. Jour. Home Econ. 10(2): 64-70. February 1918. 321.8 J82

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1349. Rose, Mary Schwartz, MacLeod, Grace, and Bisbey, Bertha. Maintenance values for the proteins of milk, bread-and-milk, meat, and soy bean curd in human nutrition. Soc. Expt. Biol. and Med. Proc. 21(3): 143, 144. December 1923. 442.9 Sol
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1350. Rose, Mary Schwartz, and MacLeod, Grace. Maintenance values for the proteins of milk, meat, bread and milk, and soy bean curd. Jour. Biol. Chem. 66(2): 847-867. December 1925. 381 J824
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1351. Rosenberger, E. T. The soy bean milk as a food. Missionary Rev. of the World 54(5): 371-372. May 1931. Libr. Cong. BV2350.M7
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1352. Ross, Gladys. Introducing Mrs. Soy bean. Ill. Agr. 42(5): 91, 94. March 1938. 6 I16
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1353. Ruata, Guido, and Testoni, Giuseppe. La soia nell'alimentazione italiana. Italy. Ministero d'Agricoltura, Industria e Commercio Bollettino Ufficiale 6(6): 698-718. Dec. 12, 1907. 16 B631
Bibliography, p. 718.
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Alternate title in English.
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1364. Slawson, H. H. Baby's milk from beans. Glowing news story of the soybean that staggers imagination. Hoard's Dairyman 81(24): 631, 649. Dec. 25, 1936. 44.8 H65
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Contribution from the States Relations Service.
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"[From the New Jersey Agricultural Experiment Station, New Brunswick, N. J.]"
"This extract can be very cheaply prepared and it may take the place, when properly modified by the addition of necessary salts, of meat extract and other digested meats in infant feeding and, since the soy bean contains very little carbohydrate and even the small amounts present are used up by the fungus, in the process of development, for energy purposes, the extract is practically free from sugars and can be introduced into diabetic cookery."

1402. Wan, Shing. Comparison of soybeans and milk in contents of vitamins B₁ and B₂. Chinese Jour. Physiol. 6(1): 35-40. Feb. 15, 1932. 447.8 C44
"(From the Department of Biochemistry, Peiping Union Medical College, Peiping.)"
Literature, p. 40.
"The relative B₁ and B₂ contents of dried soybeans and cow's milk powder (Klim) were determined by feeding experiments with rats. The results confirm the finding of other workers that the soybeans are richer in vitamin B₁ than in B₂ and that the reverse is true of milk. Soybeans contain only 2/3 as much B₂ but three times as much B₁ as Klim." - Summary, p. 38.
1403. Wan, Shing. A comparison of the dietary properties of "soybean milk" and cow's milk. Chinese Jour. Physiol. 5(4): 353-362. Nov. 15, 1931. 447.8 C44
Literature, p. 361.
"(From the Department of Biochemistry, Peiping Union Medical College, Peiping.)"
"It is evident...that before soybean milk can be recommended as a general substitute for cow's milk, further work is necessary.
"We have therefore conducted some further experiments to compare soybean milk with cow's milk and repeated some of Tso's experiments."
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1404. Wastl, H. Das haltbare sojamehl ein volksnahrungsmittel der zukunft. Chemische Rundschau für Mitteleuropa und den Balkan 4(12): 93-96. June 24, 1927. 385 C422
Importance and food value of soybean flour.
1405. Willaman, J. J. Soy bean, the most perfect crop plant. Amer. Food Jour. 17(7): 11-12. July 1922. 389.8 Am33
The high food value of the soybean is emphasized, and the preparation of soybean cheese and soy sauce are described.
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"Because of the unique nutritive value of soybeans and the rapidly increasing acreage of them grown in the United States for farm and industrial purposes, the possibility of their becoming a more important food in the American diet has for some years been an interesting conjecture. One problem has been to ascertain which among the most promising varieties might prove acceptable to the American palate. This study, extending over the three crop years 1934, 1935, and 1936, was a step in this direction."

1407. Zlataroff, Assen. Die soja und ihre verwertung als nahrungsmittel. Fortschritte der Landwirtschaft 1(17): 543-547. Sept. 1, 1926. 19 F77
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PATENTS RELATING TO SOYBEAN PRODUCTS, AND PROCESSES

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1409. Albers, George. Soybean flour and process of producing the same. U. S. Patent 1,684,654. Patented Sept. 18, 1928. Application date Nov. 14, 1925.
1410. Anderson, William C. Cereal treatment process [for soybeans, etc.]. U. S. Patent 1,850,123. Mar. 22, 1932. Application date Feb. 26, 1929.
1411. André, Emile André. Improvements in the treatment of oil seeds and the like. Brit. Patent 279,122. Jan. 17, 1929. Application date Oct. 17, 1927.
1412. Arnot, Robert. Hydrolisation of casein or casein-containing bodies [from soya-beans, etc.]. Brit. Patent 306,168. Feb. 12, 1929. Application date Nov. 12, 1927.
1413. Asari, Tugio. Preservation of soy beans. Japanese Patent 101,895. July 7, 1933. Addn. to 90,218.
1414. Baile, Roland P. New food and process of production. U. S. Patent 1,615,822. Feb. 1, 1927. Application filed Dec. 20, 1923.
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Soybeans are used in this process.
1416. Beaufour, Henri. Process for the extraction of the albumino-caseins of vegetable origin and for the separation of such albumino-caseins from amylaceous matter. U. S. Patent 1,755,531. Apr. 22, 1930. Application date Oct. 11, 1926; and in France Oct. 23, 1925.
From soybeans, etc..
1417. Belen'kii, D. E., and Popova, N. N. [Cheese from soy milk.] Russian Patents 32,907 and 32,908. Oct. 31, 1933.

1418. Berczeller, László, and Graham, R. Artificial milk. Brit. Patents 157,351 and 157,352. Jan. 10, 1921.
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1419. Berczeller, László. An improved process for treating soya beans. Brit. Patent 393,146. June 1, 1933. Application date Sept. 15, 1932; Netherlands Patent 32156. Mar. 15, 1934.
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361,956, amended with title "Process for the Manufacture of Soya Bean Flour". Nov. 25, 1931.
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- No. 28. The strawberry industry in the United States; a selected list of references on the economic aspects of the industry. September 1929.
- No. 29. Valuation of real estate, with special reference to farm real estate. November 1929. (Superseded by No. 60)
- No. 30. Large scale and corporation farming; a selected list of references. November 1929. (Supplemented by No. 69)
- No. 31. California; an index to the State sources of agricultural statistics. Part I. - Fruits, vegetables and nuts; an index to the official sources. Sections 1 and 2. January 1930; Part II. - Crops other than fruits, vegetables and nuts; an index to the official sources. June 1930; Part III. - Livestock and livestock products; an index to the official sources. January 1931; Part IV. - Land, farm property, irrigation, and miscellaneous items; an index to the official sources. April 1931; Part V. - An index to some unofficial sources. February 1930.

- No. 32. Rural standards of living; a selected bibliography. August 1930.
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- No. 33. Wheat; cost of production, 1923-1930. References relating to the United States and some foreign countries. January 1931.
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- No. 38. List of State official serial publications containing material on agricultural economics. July 1932.
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- No. 40. Barter and scrip in the United States. February 1933.
- No. 41. The domestic allotment plans for the relief of agriculture. February 1933.
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- No. 47. Farm mortgages in the United States; selected references...January 1928-April 1933. May 1933.
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- No. 56. Consumption of fruits and vegetables in the United States. An index to some sources of statistics. January 1935.
- No. 57. Economic development of the cotton-textile industry in the United States, 1910-1935. September 1935.
- No. 58. Price studies of the U. S. Department of Agriculture showing demand-price, supply-price, and price-production relationships. October 1935.
- No. 59. Farm tenancy in the United States, 1925-1935; a beginning of a bibliography. November 1935. (Superseded by No. 70)
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- No. 61. Financing American cotton production and marketing in the United States. November 1935.
- No. 62. Livestock financing in the United States; selected references to material published 1915-1935. December 1935. (Supersedes No. 7)
- No. 63. Government control of cotton production in the United States, 1933-1935. A selected list of references. January 1936.
- No. 64. Agricultural labor in the United States, 1915-1935; a selected list of references. December 1935. (Supplemented by no. 72)
- No. 65. Farm youth in the United States; a selected list of references to literature issued since October 1926. June 1936. (Supplements No. 17)
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- No. 67. Crop and livestock insurance; a selected list of references to literature issued since 1898. November 1936.
- No. 68. Incidence of the processing taxes under the Agricultural Adjustment Act; a selected list of references. January 1937.

- No. 69. Large scale and corporation farming; a selected list of references. April 1937. (Supplements No. 30; supersedes No. 46)
- No. 70. Farm tenancy in the United States, 1918-1936; a selected list of references. June 1937. (Supersedes No. 59)
- No. 71. List of periodicals containing prices and other statistical and economic information on dairy products. October 1937.
- No. 72. Agricultural labor in the United States; a selected list of references. March 1938. (Supplements no. 64)
- No. 73. Income; selected references on the concept of income and methods of obtaining income statistics. May 1938.
- No. 74. The soybean industry; a selected list of references on the economic aspects of the industry in the United States, 1900-1938. October 1938.

