Marketing Research Report No. 711

PEANUT HANDLING:

Economic Implications of the Shift from Bag to Bulk in the Virginia-North Carolina Area

by RICHARD A. KING, GILBERT W. BIGGS, E. WALTON JONES, and BILLY M. MILLER

Farmer Cooperative Service • U. S. Department of Agriculture
In cooperation with Agricultural Experiment Station
North Carolina State University at Raleigh

UNITED STATES DEPARTMENT OF AGRICULTURE
FARMER COOPERATIVE SERVICE
WASHINGTON, D.C. 20250

Joseph C. Knapp, Administrator

The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, financing, merchandising, produce quality, costs, efficiency, and membership.

The Service publishes the results of such studies; confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

This study was conducted under authority of the Agricultural Marketing Act of 1946 (RMA, Title II).

Since this report was written, the official name of North Carolina State of the University of North Carolina at Raleigh has been changed to North Carolina State University at Raleigh.

July 1965

Preface

At the request of various segments of the peanut industry, the Farmer Cooperative Service and North Carolina State College have been conducting a series of studies on the economic implications of the shift from bag to bulk handling of farmers' stock peanuts. Two earlier reports summarized the findings of studies on marketing peanuts at the farm and first-buyer levels. A third examined efficiency in the operation of bulk stations, with particular attention to the effects of size of station and rate of operation on costs. The fourth study investigated alternative locations for bulk-buying facilities for farmers' stock peanuts. This report summarizes the findings of the four earlier studies, and indicates possible required adjustments to changes in handling practices.

Other studies in the series are:

Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. Marketing Research Report No. 555, October 1962.

Economic Efficiency in Constructing and Operating Bulk Peanut Receiving Stations. A. E. Information Series No. 107, North Carolina State of the University of North Carolina at Raleigh in Cooperation with Farmer Cooperative Service, U.S. Department of Agriculture, October 1963.

Marketing Farmers' Stock Peanuts in the Virginia-North Carolina Area. Marketing Research Report No. 595, April 1963.

Economic Feasibility and Efficiency of Alternative Locations for Bulk Grading and Buying of Farmers' Stock Peanuts in North Carolina and Virginia. An unpublished Ph.D. thesis, 1963, North Carolina State of the University of North Carolina at Raleigh. (University Microfilms, Ann Arbor, Mich.)

Contents

Highlights

The shift from bag to bulk handling of farmers' stock peanuts in the Virginia-North Carolina area, almost complete by the 1964 season, will probably affect the peanut industry in several ways.

The overriding conclusion is that bulk receiving stations will be larger but fewer in number than they were when peanuts were handled primarily in bags. The keen competition among shellers for the Virginia-type peanuts may reduce the speed at which the reduction takes place. This competition has led to the construction of many stations in locations convenient to growers. From the sheller's standpoint, this may not be the most economic arrangement. In addition, recent quality controls established under the price-support program of the U.S. Department of Agriculture have made it necessary to grade each lot of farmers' stock peanuts before it loses its identity. The new quality controls require changes in facilities at buying stations. In 1964, pneumatic samplers were installed at many buying stations, and additional holding bins were constructed at stations equipped with spout-type automatic samplers. The cost of installing pneumatic samplers and of constructing more holding bins was considerable; thus, to recover part of the investment, some station owners may operate their plants longer than they otherwise would. Efficiencies indicated in this study will, however, in the long run result in larger but fewer buying stations. From this conclusion, several implications for the industry may be drawn.

New bulk-receiving stations should be designed to use least-cost techniques to provide efficient bulk handling of farmers' stock peanuts. Also, scale economies should be considered.

Rates of operation between 250 and 300 cwt. per hour make it possible to take advantage of most of the scale economies. For instance, nearly $10,000 a year could be saved in handling 80,000 cwt. of peanuts during a 400-hour season if one station capable of handling 200 cwt. of peanuts per hour were constructed instead of four with the capacity for handling 50 cwt. per hour.

When this study was initiated, approximately 200 buying stations were purchasing peanuts for 24 shelling plants at 14 locations in the area. The analysis indicated that present sheller demands at 14 locations could be handled through 45 properly located buying stations.

The cost would then be about three-quarters of a million dollars a year less than the system of handling peanuts in bags. Another quarter of a million dollars a year could be saved if shelling plants were optimally located. This would reduce the number of shelling locations from 14 to 7, and the number of bulk buying stations from 45 to 19. In addition to the estimated $1 million in savings with optimum location of bulk-buying stations and shelling plants, a reduction in shelling costs might be possible.

Bulk-handling operations require a large capital investment. Estimated total investment for stations storing peanuts ranged from $26,000 when the station is designed to operate 200 hours at 25 cwt. per hour to $1.3 million when designed to operate 600 hours at 1,000 cwt. per hour. For stations not storing peanuts, estimated investment ranged from $14,000 when the station is designed to operate 25 cwt. per hour to $40,000 when designed to operate 1,000 cwt. per hour.

Investment in these stations would not vary with length of season since storage facilities are not required.

The studies showed that approximately 84 percent of the contracts between commissioned buyers and shellers were oral contracts. Financial institutions may require more formal agreements on purchasing practices between receiving station operators and shellers before providing the necessary capital for construction of bulk-buying stations. For instance, credit agencies may require that buyers have contracts with established shellers who specify the quantity to be handled over a given number of years before loaning money for construction of a station.

Specialization usually accompanies mechanization and concentration. The buying season for bulk peanuts lasts only a few weeks and expensive equipment may be idle for much of the year. This presents a problem as to what uses can be made of peanut marketing facilities during the off season. Bulk storage at receiving stations for longer periods than has been customary with bag peanuts may be one solution.

A reduction in the number of buying stations also means that persons currently operating bag receiving stations will need other means of employment and new uses for present facilities. Additional services such as custom harvesting and artificial drying could possibly be extended to growers by peanut buyers. Buyers might also furnish additional hauling equipment.

A reduction in the number of buying stations will require that farmers haul peanuts greater distances. Trailers attached to farm tractors and small pick-up trucks may not be appropriate for these long hauls. Growers might find it necessary to purchase equipment capable of hauling peanuts greater distances to the buying station.

Small growers may find it difficult to finance expensive bulk harvesting equipment and to profit by its use. They may find it necessary to purchase such equipment jointly or hire the work done on a custom basis.

These changes have certain implications for the general public as well as for farmers and station owners. The public gains if resources freed from the operations of peanut-buying stations can be employed to produce additional goods and services. However, it is possible that resources freed by technical progress and economic efficiency may remain idle. Buying station labor that is unemployed loses and so does the general public through transfer payments to the unemployed. The public may also lose when capital investment becomes obsolete or unemployed before the end of its useful life. Also, resources may be underemployed in the sense that they are not used efficiently. Associated with the problems of unemployed resources is the problem of income redistribution as resources are shifted to new uses.

The implication of these changes to farmers is difficult to evaluate. The present price structure at the shelling plant may be viewed as the support price plus marketing charges. If growers continue to operate as small independent operators after the advantages of the new economies are realized, the price structure may not be greatly different from what it is at present. Gains from size economies might be distributed among buyers and shellers or passed on to the consumer. Adjusting to a smaller set of buying stations could mean that net farm prices would be lower as unit transportation costs increase with greater distances among stations. However, if growers joined together they might share in the economies of hauling and bulk station operation.

PEANUT HANDLING: Economic Implications of the Shift from Bag to Bulk in the Virginia–North Carolina Area

by Richard A. King, Gilbert W. Biggs, E. Walton Jones, and Billy R. Miller[1]

The peanut industry of Virginia and eastern North Carolina is in the midst of changing its practice of handling peanuts in bags to bulk handling. This transition is taking place in the buying, storing, and shelling operations. Economic forces exist that will significantly influence the final impact of this technological shift in terms of grower incomes, processor profits, and industry organization.

Objectives and Study Area

The objective of this study is two-fold: First, to identify the direction and magnitude of the changes that may be expected as a result of the shift from bag to bulk handling of farmers' stock peanuts in the Virginia-North Carolina area; and second, to spell out possible courses of action for the growers, first-buyers, and processors who will feel the impact of this technological shift.

In the United States, peanuts are produced on roughly 1½ million acres of land annually. Although total acreage is small in relation to acreage for many crops, production is highly concentrated in a small number of areas where peanuts provide an important fraction of total farm income. The location of the Virginia-North Carolina area in relation to other peanut-producing regions is shown in figure 1. In 1959 this area, encompassing 17 counties, had 14,000 farms, 200 buying stations, and about 25 shellers. Approximately 79 percent of the farmers in this area grow peanuts on 300,000 acres of land, or 25 percent of the cropland located there. Each grows an average of 22 acres of peanuts. Only two crops, corn and soybeans, exceeded peanuts in average acreage.

The distribution of production by county is shown in figure 2. The locations of first-buyers who held contracts to handle peanuts for the Peanut Growers Cooperative Marketing Association, all other buyers, and processing plants are also shown in figure 2.

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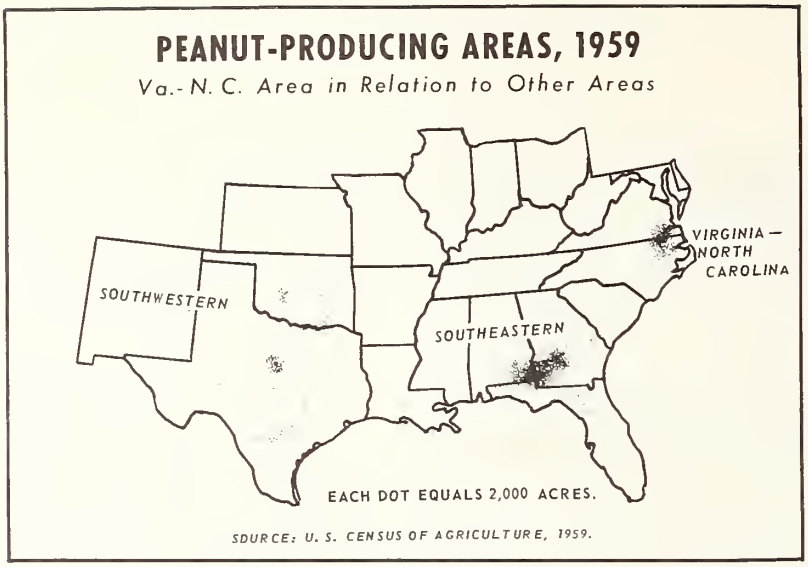


Figure 1

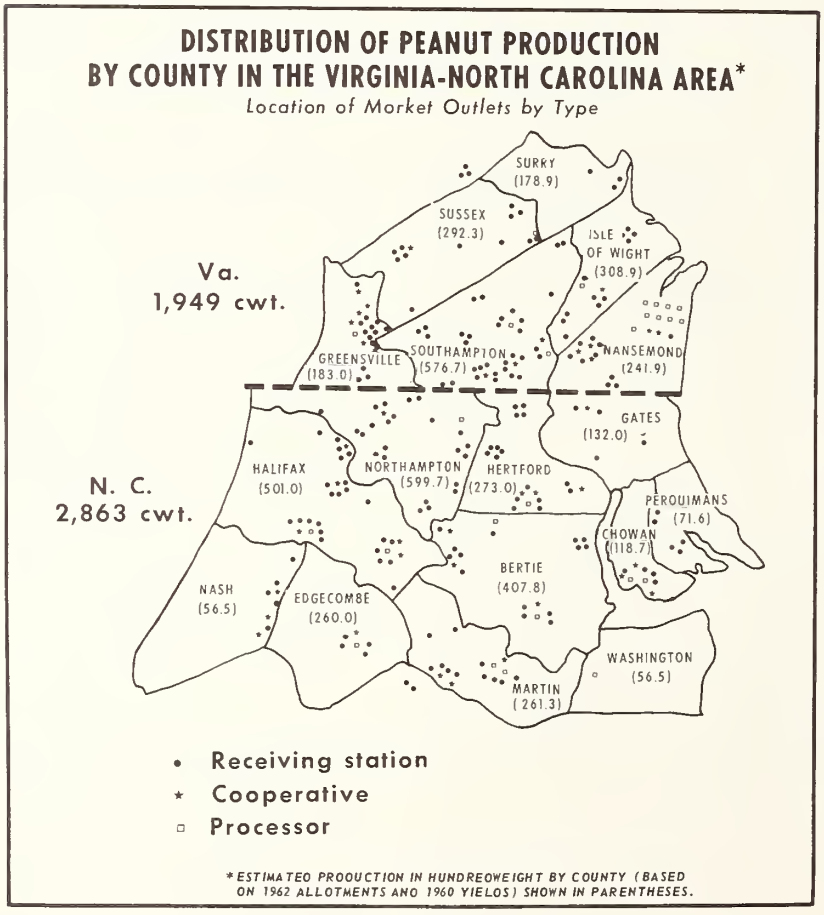


Figure 2

Cost Estimates for Bulk-Handling Stations

Selection of the optimum or least cost techniques was necessary to provide information to the industry that would be useful in making the transition from bag to bulk handling. Very little information was available on initial investment and cost of operating bulk-buying stations in the Virginia-North Carolina area.

An outline and description of the major operations in the bulk-buying stations are essential for estimating costs involved. The procedure for estimating costs varied. In general, however, the first step was to compile a list of equipment that might be used for each technique. Then, the initial cost, useful life, horsepower of electric motors, and rated capacity were determined for each item. Investment includes the initial installed cost of all items of equipment, including buildings. Annual costs include both variable components and fixed components. Variable components, depending on the stage and technique, include insurance on stored peanuts, interest on money invested in stored peanuts, the cost of electricity, repairs, and labor. Fixed cost components include depreciation, interest on investment in equipment, taxes, insurance, and repairs.

Description of Bulk Station Operations

A typical load of peanuts brought into a bulk-receiving station is weighed, sampled, graded, and either shipped immediately to a processor or stored for later shipment to one. In addition to the physical handling, certain administrative and coordinating activities are performed.

At the present time, farmers' stock peanuts are sold almost exclusively by grade, as determined at the time of delivery by the grower. Each station operator is expected to provide facilities for grading farmers' stock peanuts. The Federal-State Inspection Service provides inspectors to do the actual grading. The grading process includes screening, weighing, and shelling. The shelled kernels are split and examined for internal damage. Very small samples have been essential because the hand techniques used in grading were laborious and time consuming. With the present widespread use of mechanical equipment, larger samples may be graded, and the entire procedure may be more standardized than former methods.

The technique of weighing farmers' stock peanuts in bulk is well standardized. A drive-on scale is installed adjacent to a building which contains the scale instrument, space for grading, and space for performing office functions. The scale operator located inside the building balances the scale, which automatically stamps the weight on a card. After the truck is unloaded, the process is repeated with the empty truck to obtain net weight of the peanuts.

Techniques for moving peanuts differ somewhat, depending on the method of sampling. A bucket elevator lifts the peanuts onto a conveyor, which is located in the top of the storage warehouse and runs the length of the house. A tripper dumps the peanuts from the conveyor into the desired area.

Several types of storage structures for bulk peanuts are currently in use, including concrete silo-type houses, concrete or wood warehouses with slanted floors, and wood or metal warehouses with flat floors. Bulk handlers generally agree that a warehouse with a flat floor is the most desirable. Treatments in storage, when required, are easier; fire resulting from spontaneous combustion is less likely; and segregation by grade is facilitated. In addition, the warehouse may be used for other purposes during those seasons when it is not needed for peanuts.

Peanuts may be shipped directly to processors without temporary holding, or may be held in bins long enough for a grade to be established. Usually, however, peanuts are stored in a warehouse and held for several weeks or months before shipping. Different shipping techniques may be used in each situation.

Administrative and coordinating functions for a complete bulk-receiving station are grouped under office duties. The administrative operations at bulk stations are not particularly distinctive; problems arise mainly in connection with selecting equipment, and scheduling to prevent bottlenecks and unnecessary breaks or delays in the flow of work.

Optimum techniques were selected and operating costs analyzed for both stations that store peanuts and stations that ship peanuts directly without storage. The stations selected were those operating 200-hour, 400-hour, and 600-hour seasons at rates ranging from 25 to 1,000 cwt. per hour.

Initial Investment and Operating Costs

Stations with Storage Facilities

In 62 of the 63 storage situations studied, steel warehouses 60 feet wide had the lowest annual operating costs. In 51 of the 63 situations, a spout sampler was used in conjunction with steel holding bins raised high enough to release peanuts directly onto the warehouse conveyor. The peanuts were moved out of storage with a central conveyor and with cross conveyors.

Total investment required for stations storing peanuts and using optimum techniques ranged from $26,056 for those designed to operate 200 hours at 25 hundredweight (cwt.) per hour to $1,261,934 for those designed to operate 600 hours at 1,000 cwt. per hour. Investments per hundredweight of capacity range from $5.21 for stations designed to operate 200 hours at 25 cwt. per hour to $2.10 for stations designed to operate 600 hours at 1,000 cwt. per hour (table 1). The effect of rate of operation on investments in stations using optimum techniques and storing all peanuts received in a 400-hour season is shown in figure 3.

Table 1.--Initial investments in bulk peanut-receiving stations with storage facilities, 3 lengths of season and 3 rates of operation [1]

Length of season and rate of operation	Total investment	Investment per cwt. of capacity
	Dollars	Dollars
200 hours at--		
25 cwt. per hour. . .	26,056	5.21
250 cwt. per hour . .	125,910	2.52
1,000 cwt. per hour.	466,718	2.33
400 hours at--		
25 cwt. per hour. . .	48,016	4.80
250 cwt. per hour . .	223,495	2.24
1,000 cwt. per hour.	857,133	2.14
600 hours at--		
25 cwt. per hour. . .	58,178	3.88
250 cwt. per hour . .	325,925	2.17
1,000 cwt. per hour.	1,261,934	2.10

[1] Assuming operation at 90 percent of capacity throughout the season.

Source: Jones, E. W., and King, Richard A. Economic Efficiency in Constructing and Operating Bulk Peanut Receiving Station. A. E. Inform. Series 107, North Carolina State of the University of North Carolina at Raleigh in Cooperation with Farmer Cooperative Service, U.S. Dept. Agr., Oct. 1963.

Average annual operating costs for stations storing peanuts and using optimum techniques ranged from $.94 per cwt. for those designed to operate 200 hours at a rate of 25 cwt. per hour to $.43 per cwt. for stations designed to operate 600 hours at 1,000 cwt. per hour (table 2). Average cost per cwt. decreases

Va.-N.C. Peanut-Receiving Stations

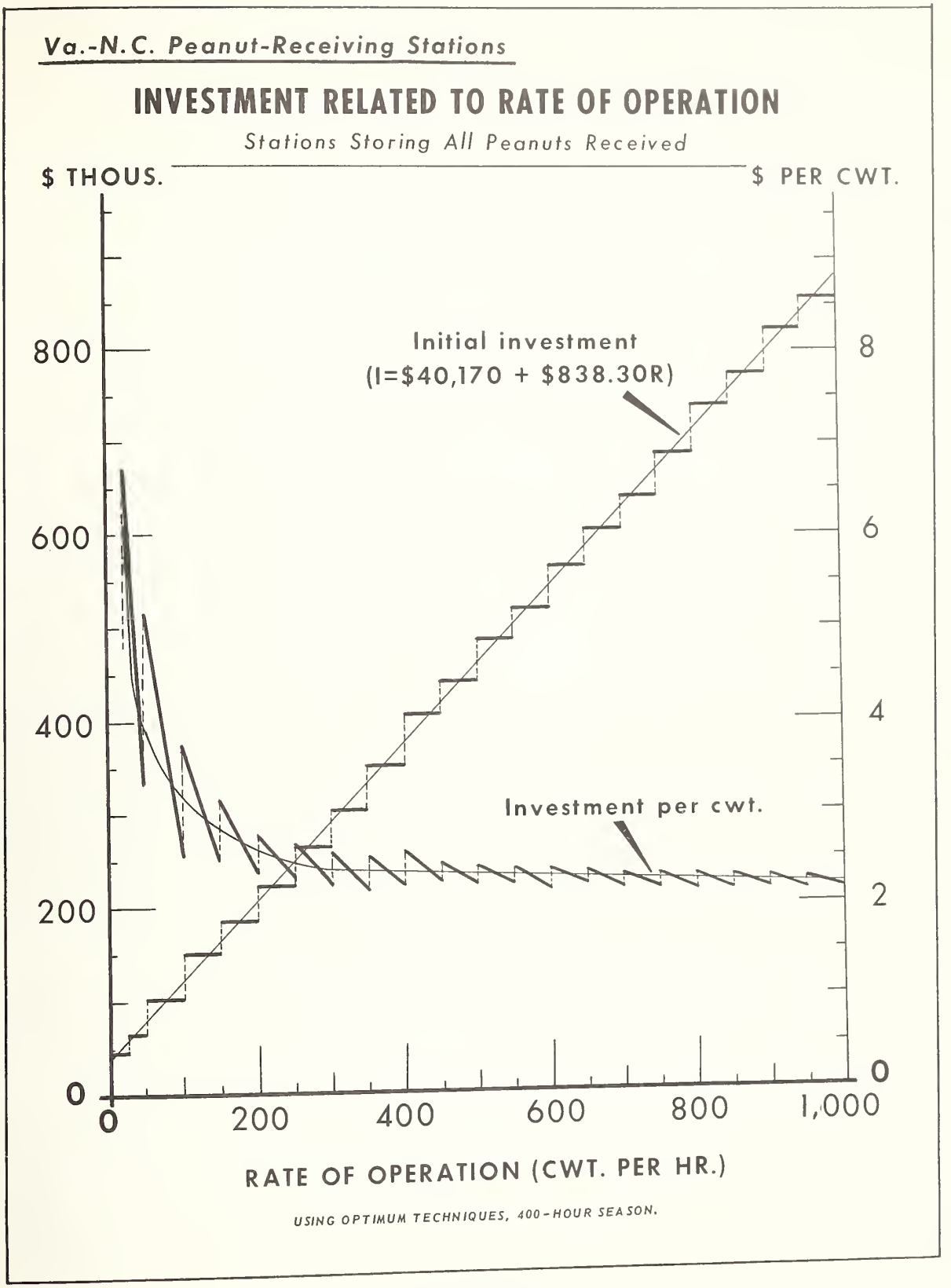


Figure 3

Table 2.--Annual operating costs for bulk peanut-receiving stations with storage facilities, 3 lengths of seasons and 3 rates of operation[1]

Length of season and rate of operation	Total annual operating costs	Average annual operating costs per cwt.
	Dollars	Dollars
200 hours at--		
25 cwt. per hour	4,688	.94
250 cwt. per hour	23,131	.46
1,000 cwt. per hour	88,783	.44
400 hours at--		
25 cwt. per hour	7,066	.71
250 cwt. per hour	44,092	.44
1,000 cwt. per hour	173,084	.43
600 hours at--		
25 cwt. per hour	9,212	.61
250 cwt. per hour	65,730	.44
1,000 cwt. per hour	259,820	.43

[1] Assuming operation at 90 percent of capacity throughout the season.

Source: Jones, E. W., and King, R.A. Economic Efficiency in Constructing and Operating Bulk Peanut Receiving Stations. (See table 1 for full citation.)

sharply for each length of season as the rate increases to 250-300 cwt. per hour. Little reduction in average annual cost is realized beyond a rate of 300 cwt. per hour. Annual costs for stations using optimum techniques and operating a 400-hour season are shown in figure 4.

Stations Without Storage Facilities

The optimum type of station without storage facilities is one which uses a spout sampler in conjunction with elevated holding bins. The peanuts are dumped directly into the processor's truck from the holding bins.

Total investments in bulk stations shipping all peanuts directly to processors do not vary with the length of season, since storage facilities are not required.

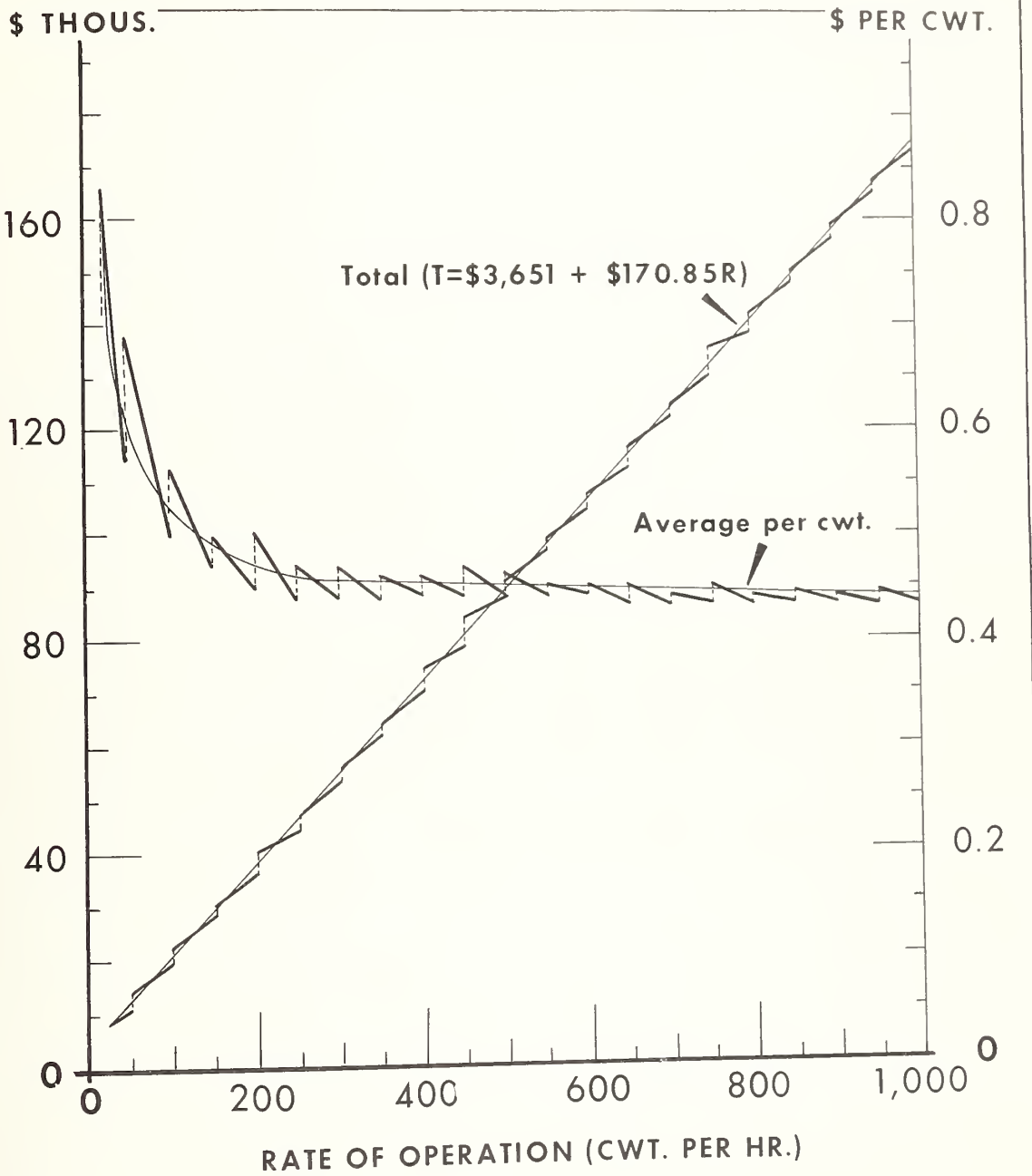
Investments in stations not storing peanuts and using optimum techniques ranged from $14,325 for those designed to operate at 25 cwt. per hour to $40,441 for those designed to operate at 1,000 cwt. per hour. Investments per cwt. of capacity ranged from $2.86 at a rate of 25 cwt. per hour for a 200-hour season to 7 cents at a rate of 1,000 cwt. for a 600-hour season (table 3). The effect of rate of operation on investments in stations using optimum techniques and shipping peanuts received without storage is shown in figure 5.

Average annual operating costs for stations without storage facilities ranged from $.39 per cwt. for stations designed to operate 200 hours at 25 cwt. per hour to $.05 per cwt. for stations designed to operate 600 hours at 1,000 cwt. per hour (table 4). Scale economies are negligible for rates above 300 cwt. per hour. The effect of rate of operation on annual operating costs for bulk-receiving stations using optimum techniques and shipping all peanuts without storage for a 400-hour season is shown in figure 6.

*Va.-N.C. Peanut-Receiving Stations**

ANNUAL COSTS RELATED TO RATE OF OPERATION

Stations Storing All Peanuts Received



*USING OPTIMUM TECHNIQUES, 400-HOUR SEASON.

Figure 4

Table 3.--Initial investments in bulk peanut-receiving stations without storage facilities, 3 lengths of seasons and 3 rates of operation[1]

Length of season and rate of operation	Total investment[2]	Investment per cwt. of capacity
	Dollars	Dollars
200 hours at--		
25 cwt. per hour	14,325	2.86
250 cwt. per hour	16,958	.34
1,000 cwt. per hour	40,441	.20
400 hours at--		
25 cwt. per hour	14,325	1.43
250 cwt. per hour	16,958	.17
1,000 cwt. per hour	40,441	.10
600 hours at--		
25 cwt. per hour	14,325	.96
250 cwt. per hour	16,958	.11
1,000 cwt. per hour	40,441	.07

[1] Assuming operation at 90 percent of capacity throughout the season.
[2] Total investment was the same for all lengths of seasons since no storage facilities were required.

Source: Jones, E. W., and King, R. A. Economic Efficiency in Constructing and Operating Bulk Peanut Receiving Stations. (See table 1 for full citation.)

Table 4.--Annual operating costs for bulk peanut-receiving stations without storage facilities, 3 lengths of season and 3 rates of operation[1]

Length of season and rate of operation	Total annual operating costs	Average annual operating costs per cwt.
	Dollars	Dollars
200 hours at--		
25 cwt. per hour	1,946	.39
250 cwt. per hour	4,213	.08
1,000 cwt. per hour	13,844	.07
400 hours at--		
25 cwt. per hour	2,251	.22
250 cwt. per hour	6,427	.06
1,000 cwt. per hour	22,670	.06
600 hours at--		
25 cwt. per hour	2,556	.17
250 cwt. per hour	8,640	.06
1,000 cwt. per hour	31,494	.05

[1] Assuming operation at 90 percent of capacity throughout the season.

Source: Jones, E. W., and King, R. A. Economic Efficiency in Constructing and Operating Bulk Peanut Receiving Stations. (See table 1 for full citation.)

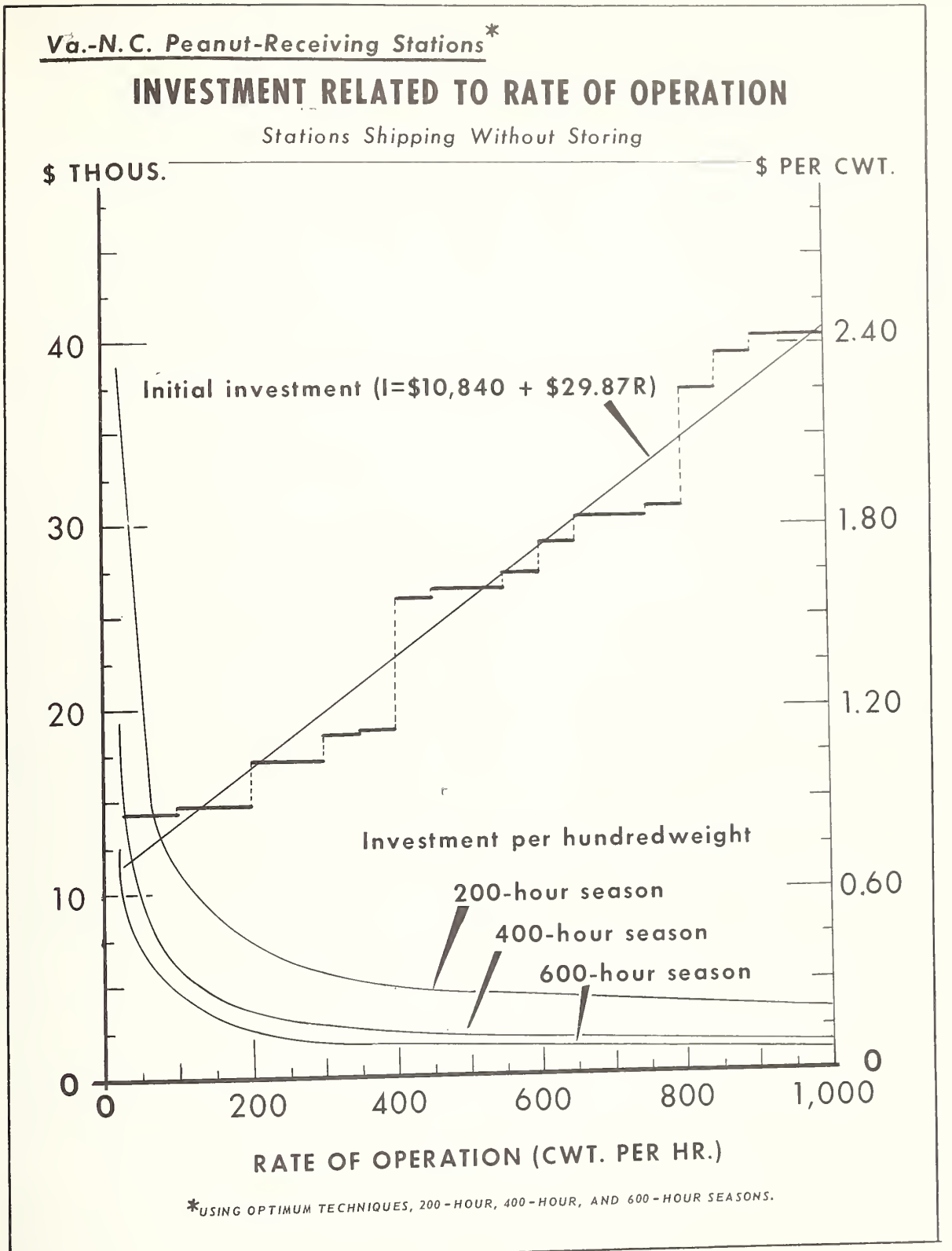
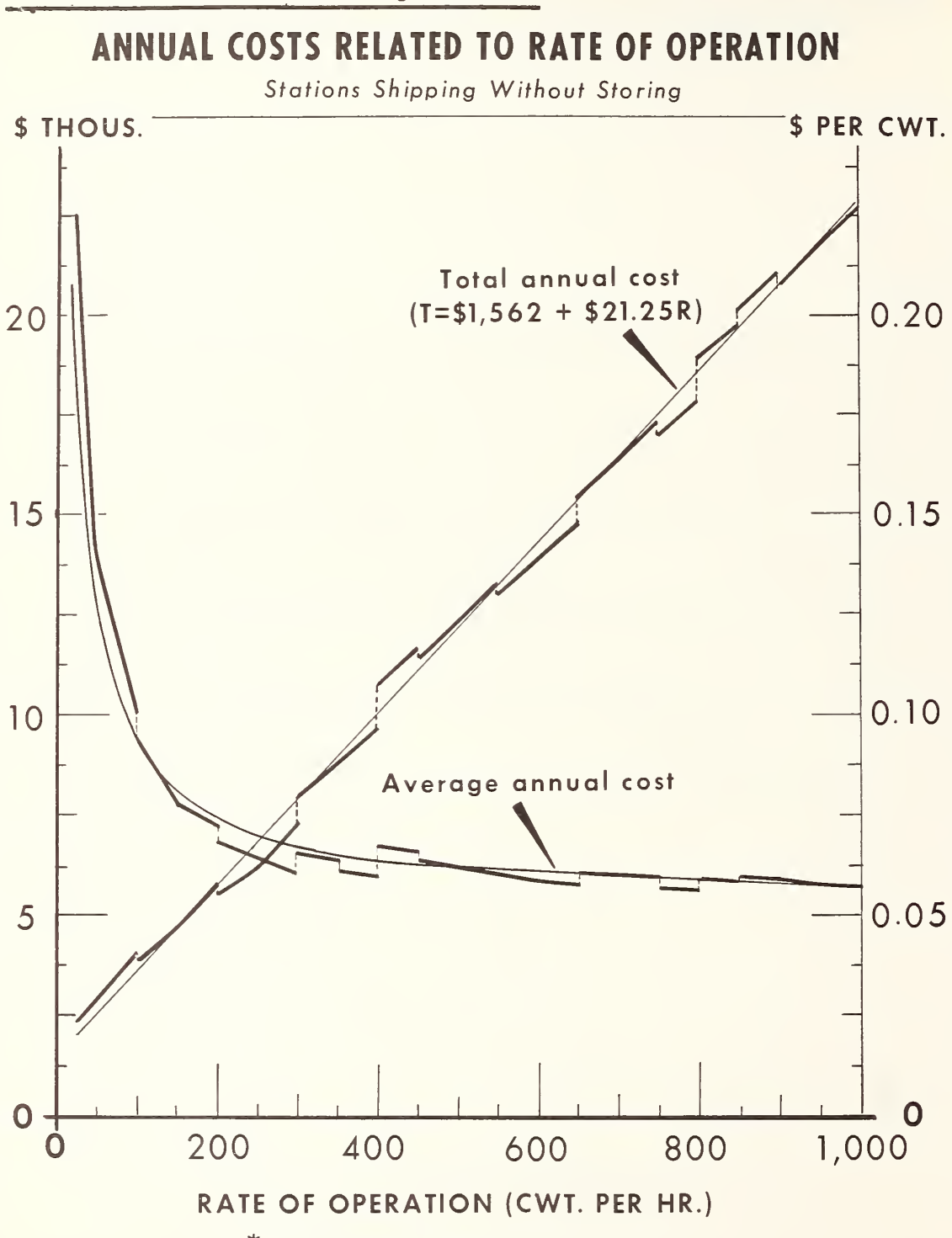

Va.-N.C. Peanut-Receiving Stations*
INVESTMENT RELATED TO RATE OF OPERATION
Stations Shipping Without Storing
$ THOUS.
$ PER CWT.
40
30
20
10
0
2.40
1.80
1.20
0.60
0
Initial investment (I=$10,840 + $29.87R)
Investment per hundredweight
200-hour season
400-hour season
600-hour season
0
200
400
600
800
1,000
RATE OF OPERATION (CWT. PER HR.)
*USING OPTIMUM TECHNIQUES, 200-HOUR, 400-HOUR, AND 600-HOUR SEASONS.

Figure 5

*Va.-N.C. Peanut- Receiving Stations**



*USING OPTIMUM TECHNIQUES, 400-HOUR SEASON.

Figure 6

Selection of Optimum Locations, Number, and Size of Bulk Peanut-Receiving Stations

The decision to locate a particular kind of economic activity usually takes into account a number of factors. A wise decision usually requires an analysis of the key variables which influence the selection of plants with respect to number, size, and location. At least seven important variables are involved here. They are (1) the supply of farmers' stock peanuts, (2) locations of these supplies, (3) transportation costs from farm to bulk station, (4) locations of bulk-receiving stations, (5) internal economies in station operations, (6) transportation costs from bulk stations to peanut shellers and crushers, and (7) quantity of peanuts demanded at shelling plants.

Procedure

Peanut-producing communities were identified in the North Carolina-Virginia area. One hundred and eighty-eight communities were selected in North Carolina and 46 in Virginia (figure 7). Total acreage in the North Carolina communities amounted to 94 percent of total allotted acreage in the State; the Virginia communities contained 99 percent of the State total. Allotments in 1962, the most recent year for which data were available, were combined with those of 1960, the high-yield benchmark year, to compute a representative amount produced in each community. The estimated production of farmers' stock peanuts in the study area is shown in figure 8.

The cost of transporting peanuts from the farm to bulk-receiving stations in 6,000-pound loads was estimated by use of the following equation:

$$TC_f = \$.004166 + .003883\ Mr$$

where TC_f is cost per cwt., and Mr represents round-trip distance from farm to station.

The cost of moving peanuts from bulk stations to shellers is less costly for a given tonnage than the cost of transportation from farm to station because the trucks used are much larger than the $1\frac{1}{2}$-ton trucks for which farm transportation was estimated. In the study area the greatest distance between buying point and sheller-crusher is not more than 140 miles. The following equation was used to estimate transfer costs from buying point to sheller:

$$TC_p = \$.1242 + .001623\ Mo$$

where TC_p is cost per cwt., and Mo represents one-way distance between station and sheller.

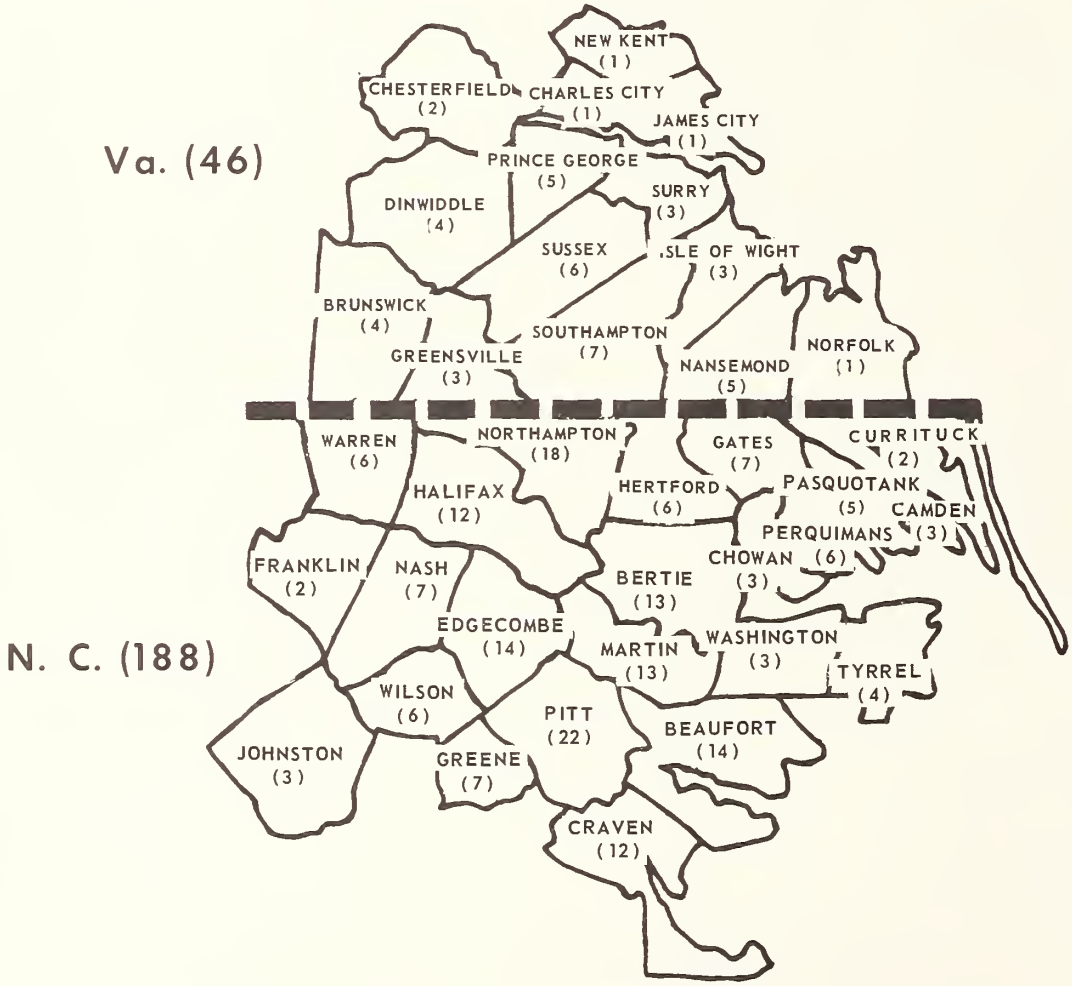
The fixed cost per cwt. is much higher for large trucks than for small ones, but the variable cost is about two-fifths that of farm assembly. Farm-to-buyer assembly costs were computed on the basis of a round trip, while the station-to-sheller rate was computed as a one-way haul only. The reason for this difference is that a large part of buyer-to-sheller transportation was handled by commercial firms.

The selection of locations for potential peanut-buying stations was based primarily on historical data. Of the approximately 115 peanut-buying points identified, 100 were selected for this analysis. Of these, 59 were located in North Carolina and 41 in Virginia.

Twenty-four shelling plants were in operation at the time of the study. Thirty shelling plants have been in operation within the past 5 years, but three of these were in areas excluded from the study and three were currently inactive. These plants were located in 14 towns and were owned by 18 firms. Eight firms were operating in Suffolk, which has approximately 55 percent of the total shelling capacity of the Virginia-North Carolina area. While specific information on sheller volumes is not available, it is believed that the data used in this study are representative of the situation prevailing in the early 1960's.

Va.-N.C. Peanut-Producing Area Study, 1962

NUMBER AND LOCATION OF 234 COMMUNITIES SELECTED BY COUNTY



NUMBERS REPRESENT NUMBER OF COMMUNITIES.

Figure 7

Va.-N.C. Peanut-Producing Area Study, 1962

ESTIMATED PRODUCTION OF FARMERS' STOCK PEANUTS

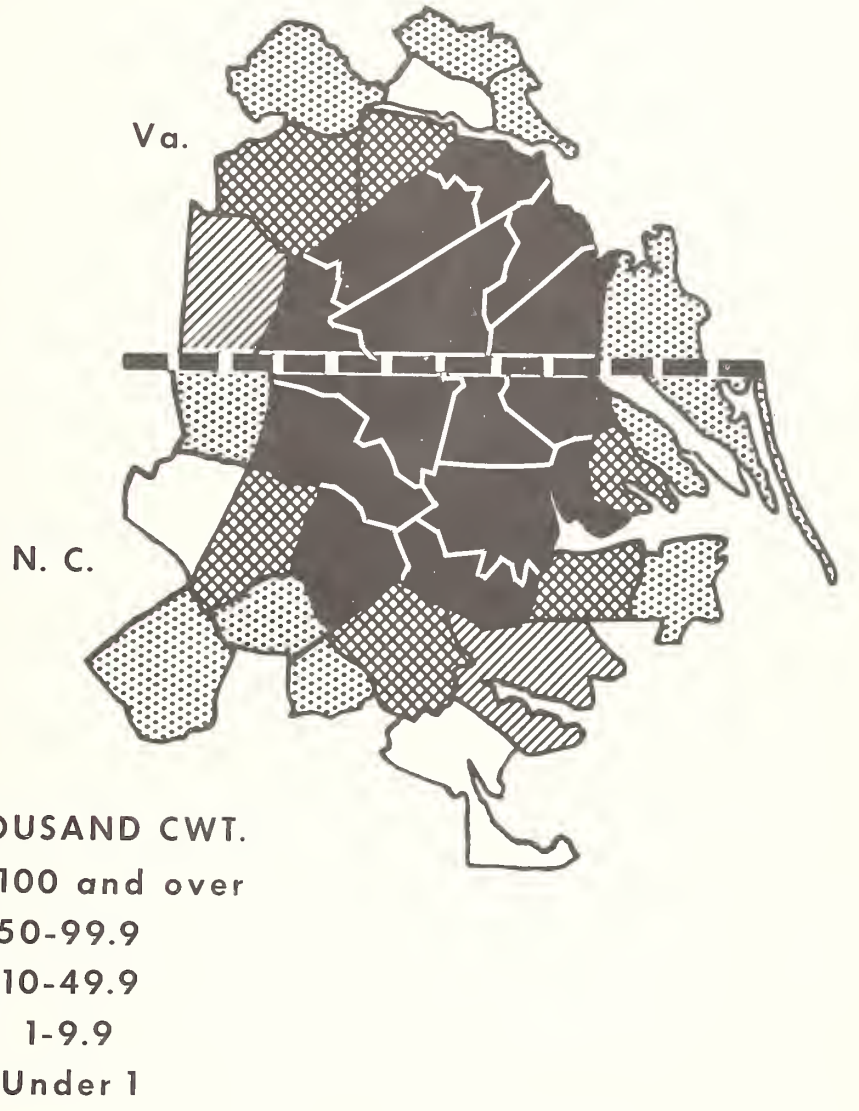


Figure 8

The Analytical Model

In order to accomplish an orderly examination of the key variables in a plant location decision, an analytical model is useful. This analysis is based on three models developed by B. R. Miller.[2] These are briefly summarized here. First, in each model the locations of bulk stations were selected so that each station had an exclusive supply area containing specific quantities of farmers' stock peanuts. The quantity of peanuts available in this supply area was therefore known. Second, each station had a market area containing known locations of crushers and shellers who demanded known amounts of peanuts. Third, the supply area and the market area contained points of supply and points of demand where varying quantities may be assembled.

Model A

Assumptions used for model A are (1) unit transport costs between any two points are constant; (2) the amount of farmers' stock peanuts supplied is equal to the amount of peanuts demanded; (3) economies of size are not introduced. This model serves as a first approximation for models B and C, where other considerations are taken into account.

In model A, 70 bulk-buying stations appeared in the least-cost solution. Of these, 51 were located in North Carolina and 19 in Virginia. A distribution of these stations by volume and estimated average fixed cost is shown in table 5. Examination of table 5 reveals that average fixed costs for several stations were very high. These high averages suggest that if size economies were taken into consideration, some of the stations would be unable to compete with nearby stations whose costs are lower. However, this model does set an upper limit to the optimum number of stations, and provides a set of locations from which a more efficient set can be derived.

Model B

In model B, the economies of size introduced are based on a study by E. W. Jones and R. A. King.[3] The following equation was used to estimate total annual operating costs with respect to rate of operation, length of season, and average size load of peanuts:

$$T = \$1,605.40 + \$3.1591R + \$.063855RS - \$.000444LRS$$

where T is the total annual costs,
R is the rate of operation in cwt. per hour,
L is the average size load of peanuts, and
S is the length of season in hours.

The equation was simplified by assuming that the size of farm deliveries (L) averages 60 cwt. and that the length of season (S) was 400 hours. The resulting equation took the following form: $T = \$1,605 + \$.0478V$

where T is the total annual costs, and
V is the total volume.

Fifty-eight of the 70 stations in the solution for model A are in the Suffolk supply area, and 169 of the 234 communities ship peanuts to Suffolk. When economies of size are introduced, the number of buying stations decreases from 70 to 49. The number in Virginia remains approximately the same, but that in North Carolina is substantially lower (table 6). Four of these stations would be unnecessary, since the possible reduction in average station

[2] Miller, Billy Ray. Economic Feasibility and Efficiency of Alternative Locations for Bulk Grading and Buying of Farmers' Stock Peanuts in North Carolina and Virginia. Unpublished Ph.D. Thesis, North Carolina State of the University of North Carolina at Raleigh, 1963. (University Microfilms, Ann Arbor, Mich.)

[3] Jones, E. W., and King, R. A. Economic Efficiency in Constructing and Operating Bulk Peanut Receiving Stations. North Carolina State College of the University of North Carolina at Raleigh in Cooperation with Farmer Cooperative Service, U.S. Dept. Agr., A.E. Inform. Series 107, Oct. 1963.

Table 5.--Number, size, and average fixed costs of bulk peanut-buying stations that minimize total assembly and distribution costs, model A

Annual volume (thousand cwt.)	Average fixed costs per cwt.	Buying stations		
		N.C.	Va.	Area total
	Dollars	Number	Number	Number
1 - 9	0.19 and over	5	2	7
10 - 19	.09 - .18	6	0	6
20 - 39	.04 - .08	15	3	18
40 - 79	.02 - .04	15	8	23
80 - 159	.01 - .02	7	3	10
160 and over	.01	3	3	6
Total stations		51	19	70
Inactive sites		8	22	30
Total number of sites		59	41	100

Source: Miller, Billy R. Economic Feasibility and Efficiency of Alternative Locations for Bulk Grading and Buying of Farmers' Stock Peanuts in North Carolina and Virginia. Unpublished Ph.D. Thesis, 1963, North Carolina State of the University of North Carolina at Raleigh. (University Microfilms, Ann Arbor, Mich.)

Table 6.--Number, size, and average fixed costs of bulk peanut-buying stations that minimize total assembly and distribution costs when economies of size in buying are considered, model B

Annual volume (thousand cwt.)	Average fixed costs per cwt.	Buying stations		
		N.C.	Va.	Area total
	Dollars	Number	Number	Number
1 - 9	0.28 and over	0	3	3
10 - 19	-	0	0	0
20 - 39	.04 - .06	5	2	7
40 - 79	.03 - .04	9	9	18
80 - 159	.01 - .02	12	3	15
160 and over	.01	3	3	6
Total stations		29	20	49
Inactive sites		30	21	51
Total number of sites		59	41	100

Source: Miller, Billy R. Economic Feasibility and Efficiency of Alternative Locations for Bulk Grading and Buying of Farmers' Stock Peanuts in North Carolina and Virginia. (See table 5 for full citation.)

costs by shipping to other nearby stations quantities allocated to the four would be larger than the cost of such transfer.

Model C

An analysis of the quantities of farmers' stock peanuts demanded at both shelling and buying points was made in model C. Both the number of shellers and the number of country buying points were allowed to vary. The results of this model, with economies of scale in shelling plants, are shown in table 7. Transportation costs decrease as the number of shellers increase. On the other hand, each additional sheller increases total annual fixed sheller costs by $27,671. For any given number of shellers, the procedure described earlier was followed for selecting the optimum number of country buying stations.

In general, the optimum number of buying stations decreased as the number of shellers increased. With seven shellers in operation, total transportation costs amount to $632,720, fixed sheller costs amount to $193,697, and 18 country buying stations with annual fixed costs totaling $28,890 are required. The addition of an eighth shelling plant would reduce transportation costs by approximately $19,000, but fixed sheller costs would rise by about $28,000. The decrease in fixed costs of buying stations would be insufficient to offset the increase in fixed sheller costs. Therefore, it appears that when consideration is given to economies of size in shelling plants, the optimum number of shellers required would be 7 and the corresponding number of country buying stations 18.

Economies of size in the operations of both shelling plants and bulk-buying stations are taken into account in table 8. Again it was

Table 7.--Minimum total marketing costs for farmers' stock peanuts if there are economies of size in shelling but not in bulk-buying station operations

Shellers[1]	Transportation costs		Fixed sheller costs		Bulk-buying stations	Fixed costs at bulk-buying stations	
	Total	Marginal	Total	Marginal		Total	Marginal
Number	Dollars	Dollars	Dollars	Dollars	Number	Dollars	Dollars
1	1,009,522	-108,988	27,671	27,671	55	88,275	-14,445
2	900,534	-87,980	55,342	27,671	46	73,830	-11,235
3	812,554	-82,620	83,013	27,671	39	62,595	-17,655
4	729,934	-37,733	110,684	27,671	28	44,940	-3,210
5	692,201	-30,926	138,355	27,671	26	41,730	-8,025
6	661,275	-28,555	166,026	27,671	21	33,705	-4,815
7	632,720	-18,993	193,697	27,671	18	28,890	-4,815
8	613,727	-15,263	221,368	27,671	15	24,075	-4,815
9	598,464	-12,542	249,039	27,671	12	19,260	0
10	585,922	-8,156	276,710	27,671	12	19,260	-1,605
11	577,766	-6,933	304,381	27,671	11	17,655	0
12	570,833	-5,305	332,052	27,671	11	17,655	0
13	565,528	-3,291	359,723	27,671	11	17,655	-1,605
14	562,237		387,394	27,671	10	16,050	

[1] Locations include Edenton, Ahoskie, Enfield, Gates, Windsor, Severn, Greenville, Williamston, Aulander, Franklin, Zuni, Courtland, Wakefield, and Suffolk.

Source: Miller, Billy R. Economic Feasibility and Efficiency of Alternative Locations for Bulk Grading and Buying of Farmers' Stock Peanuts in North Carolina and Virginia. (See table 5 for full citation.)

Table 8.--Minimum total marketing costs for farmers' stock peanuts when there are economies of size in shelling and in bulk station operations

Shellers[1]	Transportation costs		Fixed sheller costs		Bulk-buying stations	Fixed costs at bulk-buying stations	
	Total	Marginal	Total	Marginal		Total	Marginal
Number	Dollars	Dollars	Dollars	Dollars	Number	Dollars	Dollars
5	697,745	-31,571	138,355	27,671	16	25,680	-3,210
6	666,174	-32,925	166,026	27,671	14	22,470	-3,210
7	633,249	-18,543	193,697	27,671	12	19,260	-3,210
8	614,706	-15,857	221,368	27,671	10	16,050	-3,210
9	598,849	-12,542	249,039	27,671	8	12,840	0
10	586,307	-8,156	276,710	27,671	8	12,840	-1,605
11	578,151	-6,933	304,381	27,671	7	11,235	0
12	571,218	-5,305	332,052	27,671	7	11,235	0
13	565,913	-3,291	359,723	27,671	7	11,235	-1,605
14	562,622		387,394	27,671	6	9,630	

[1] Locations include Edenton, Ahoskie, Enfield, Gates, Windsor, Severn, Greenville, Williamston, Aulander, Franklin, Zuni, Courtland, Wakefield and Suffolk.

Source: Miller, Billy R. Economic Feasibility and Efficiency of Alternative Locations for Bulk Grading and Buying of Farmers' Stock Peanuts in North Carolina and Virginia. (See table 5 for full citation.)

found that no more than seven shelling plants could be justified if the decrease in transportation costs were balanced against the increased fixed cost of establishing shelling plants. The number of country buying stations is now 12, compared with 18 when economies of size in the operations of buying stations were ignored.

Estimated Annual Transportation and Bulk Buying Costs for Models A, B, and C

A comparison of estimated annual costs of transportation and bulk buying of peanuts for models A, B, and C is shown in table 9. Where economies of scale in bulk station operations are taken into account, total annual transportation costs increase from model A to model B. Total transportation costs are lower for model C. Total bulk buying costs also decrease from model A to models B and C. Taken together, transportation and bulk buying costs are least for model C, where 19 buying stations and 7 shelling plants are in operation.

Estimated costs for plants handling peanuts in bags under 1961 production conditions are also presented in table 9. For these plants, total transportation costs are roughly double and bulk buying costs nearly 3 times those of model C.

Figure 9 shows the best locations for bulk peanut buying stations in North Carolina and Virginia. Locations of the first rank are those which appear in all three models. The second best set consists of locations which appear in models A and B but not in model C. There are 30 locations in the second set. These and the first 15 constitute the 45 stations in model B. The set ranking third is composed of those locations that are excluded from the solutions of models B and C, but are included in model A. There are 23 of these stations. The sum of the three best sets of station locations represents 68 of the 70 stations in the model A solution.

Table 9.--Comparison of estimated annual costs of transporting and buying bulk peanuts for stations in models A, B, and C, and bag handling costs under 1961 conditions

Item	Unit	Bulk-buying stations			Stations with bag handling only
		Model A	Model B	Model C	
Buying stations	Number	70	45	[1] 19	--
Production in area	Thousand cwt.	4,183	4,183	4,183	4,183
Transportation costs	Thousand dollars	880.8	893.0	633.2	1,233.2
Station buying costs	Thousand dollars	342.4	302.3	260.6	722.0
Total transportation and station buying costs	Thousand dollars	1,223.2	1,195.3	893.8	1,955.2

[1] Includes 7 bulk-buying stations located at shelling sites and 12 locations with bulk buying stations only.

Source: Miller, Billy R. Economic Feasibility and Efficiency of Alternative Locations for Bulk Grading and Buying of Farmers' Stock Peanuts in North Carolina and Virginia. (See table 5 for full citation.)

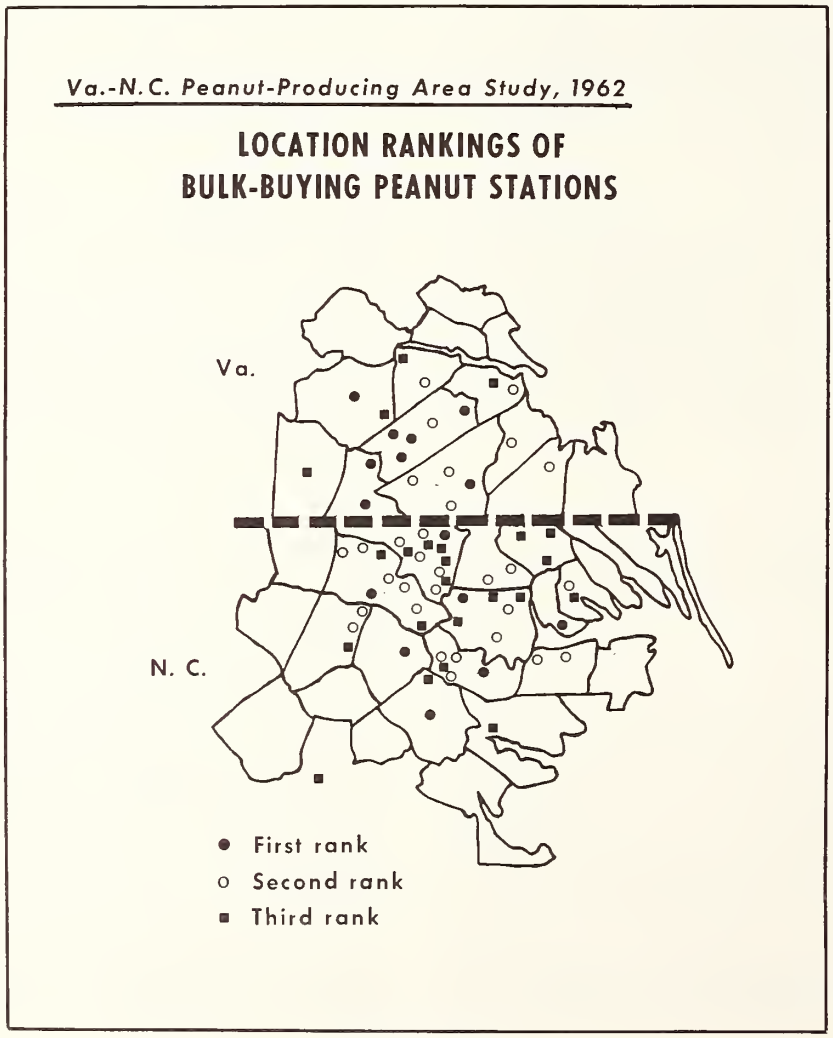


Figure 9

Adjustments Required in the Area

Several adjustments will be necessary in the study area. Construction of buying stations designed for efficient handling of bulk peanuts is the focal point of the industry transition. However, other adjustments, such as developing new transportation services, investing in new harvesting and drying facilities, and possibly relocating storage facilities, will also be required. New buyer services and new grower activity may be desirable. New uses may be found for bag warehouse facilities, and new employment opportunities or accelerated out-migration provided for workers no longer needed in the marketing of peanuts. The magnitude of these adjustments is described here with the 1958 peanut marketing season as a basis for comparison. The term "base period" as used in the following analysis refers to the 1958 peanut marketing season. Possible courses of action for both growers and marketing firms are presented.

The transition from bag to bulk handling of peanuts in the study area has taken place very rapidly. According to records of the Federal-State Fruit and Vegetable Inspection Service, 95 percent of the Virginia crop was handled in bulk during 1963, and 85 percent of the North Carolina crop was handled in bulk during 1964.

There are indications, however, that at least two factors may slow down the reduction in the number of buying stations. Because of the keen competition among shellers for Virginia-type peanuts, many stations have been established at locations convenient to growers. From the sheller's standpoint, this may mean a more costly operation. Because of recent quality controls established under the price-support program of the U.S. Department of Agriculture, each lot of farmers' stock peanuts must be graded before its identity is lost. In 1964, pneumatic samplers were installed at 115 buying stations in the study area at an approximate cost of $5,000 per unit. Additional holding bins were also constructed at stations equipped with spout-type automatic samplers. The cost of installing pneumatic samplers and of constructing the new holding bins represents a considerable investment for station owners. To compensate for these outlays, many station owners will probably continue operating their stations over a longer period of time. In spite of these countervailing forces, it is apparent that efficiencies indicated in this study will, in the long run, result in larger but fewer buying stations.

Tables 3 and 4 show initial investments and annual operating costs for bulk stations without storage facilities and using optimum techniques. These tables show costs for stations operating at three different rates and for three lengths of season. For stations operating long seasons, the initial investment and annual operating costs per cwt. are less than those for stations in operation for shorter seasons. Annual operating costs for these stations are considerably less than initial costs.

Tables 1 and 2 show initial investments and annual operating costs for bulk stations with storage facilities and operating at the same rates and for the same lengths of season as stations without storage facilities. The initial investment made in stations with storage facilities obviously is very much larger than that made in stations operating only as receiving stations. As stations become larger and operate longer seasons, investments per cwt. of peanuts received decrease.

Investments in stations with storage facilities are between 2 and 30 times as costly as those in stations having similar receiving capacities without storage space. Annual operating costs for stations of this type are from two to eight times those of similar receiving capacities without storage space. For a station receiving 250 cwt. of peanuts per hour, initial investment is $.17 per cwt.

if it has no storage facilities, and $2.24 with storage space, assuming each type of station operates a 400-hour season. For stations receiving 250 cwt. per hour and operating a 400-hour season, annual costs are $.06 per cwt. if it has no storage facilities, and $.44 per cwt. if it has storage facilities.

New Station Investment for Model B

Because of the interrelationships between the variables, length of season, rate of operation, and costs, it is necessary to make certain assumptions regarding them. The first has to do with length of season. For this analysis, a 400-hour season was assumed. Interviews with marketing firms showed that in the 1958 buying season roughly 90 percent of the total peanut crop was sold during the 8 weeks from October 27 through December 20.

The following tabulation shows the percentage of the total peanut crop purchased during specified periods of the 1958 market season:

Purchasing period	Percentage of total peanut crop purchased	
	Per period	Cumulative
	Percent	Percent
Prior to Oct. 27	3.5	3.5
Oct. 27 - Nov. 8	17.7	21.2
Nov. 10 - Nov. 22	28.7	49.9
Nov. 24 - Dec. 6	28.7	78.6
Dec. 8 - Dec. 20	15.1	93.7
After Dec. 22	6.3	100.0

Source: Biggs, G. W., King, R. A., and Jones, E. W. Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 555, Oct. 1962.

However, there is reason to believe that this period is longer than might be expected with full conversion to bulk handling. To the extent that shorter seasons are experienced, stations with larger capacities would be required, and investment costs would be higher than those cited in table 10.

The distribution of stations in the model B solution with respect to number, size, and location is shown in table 10. Based on the 400-hour season assumed, annual purchases have been converted to rate of operation. The initial investment per location is shown both for stations without storage capacity and stations with storage capacity. The total investment required in the area would amount to $894,400 for stations having no storage facilities and $12,150,500 for stations with full storage capacity. These estimates were made for 49 stations, while model B calls for 45 stations. If 4 of the 49 stations were combined with stations in other locations, total investment required would then be $851,100 and $11,992,700 respectively.

A comparison of model B with model C shows that the reduction from 45 to 19 stations is not concentrated at the smaller size locations alone. The adjustment would be of the same general type as that described earlier, but it would be more severe if economies of size in both bulk station and shelling plant operations were fully utilized. In model C, the 12 smaller locations are bulk-buying stations only, while the seven larger locations are both bulk station and shelling sites. (See tabulation below.)

Annual purchases (thousand cwt.)	Number of locations	
	Model B	Model C
Under 40	6	1
40-59	9	4
60-79	8	4
80-99	7	3
100-499	14	1
500 and over	1	6
Total	45	19

Table 10.--Optimum number and size of bulk peanut-buying stations and initial investments in these stations, Virginia and North Carolina, model B

Annual purchases per station (thousand cwt.)	Rate of operation[1] (cwt. per hour)	Buying stations[2]			Initial investment per station[3]	
		N.C.	Va.	Area total	Without storage facilities	With storage facilities
		Number	Number	Number	1,000 dollars	1,000 dollars
Under 20	Under 50	0	3	3	11.1	46.7
20 to 39	50 to 99	5	2	7	13.1	102.7
40 to 59	100 to 149	6	3	9	14.6	144.8
60 to 79	150 to 199	2	6	8	16.1	186.9
80 to 99	200 to 249	6	1	7	17.6	229.1
100 to 139	250 to 349	5	1	6	19.8	292.3
140 to 179	350 to 449	2	1	3	22.8	376.6
180 to 209	450 to 549	2	0	2	25.8	460.9
220 and over	550 and over	1	3	4	36.8	771.0
Total number of stations	--	29	20	49	--	--
Total station investment in area	--	--	--	--	894.4	12,150.5

[1] Assumes 400-hour season (8 weeks, 50 hours per week).

[2] Miller, Billy R. Economic Feasibility and Efficiency of Alternative Locations for Bulk Grading and Buying of Farmers' Stock Peanuts in North Carolina and Virginia. (See table 5 for full citation.)

[3] Jones, E. W., and King, R. A. Economic Efficiency in Constructing and Operating Bulk Peanut Receiving Stations. (See table 1 for full citation.) Figures for stations without storage based on equation I = $10,840 + $29.87R, assuming one station per location. Figures for stations with storage facilities based on equation I = $39,450 + $25.25R + $2.044 (400) R or I = $39,450 + $842.85R, assuming one station per location.

In the base period, 1958 peanut-buying season, first-buyers provided storage for roughly one-third of the volume purchased (table 11). If it is assumed that other firms in the industry have facilities to store two-thirds of peanut purchases in bulk, an investment of $4,527,800 would provide receiving capacity for the entire crop and storage capacity for the third of the crop currently stored by first-buyers.

A survey of first-buyers revealed that inventories are concentrated in the hands of the larger buying firms. Roughly 70 percent of inventories were held by firms purchasing 27,000 bags of peanuts or more, 25 percent by firms purchasing between 15 and 26.9 thousand bags, and 5 percent by firms purchasing less than 15,000 bags annually (table 12).

Table 11.--Purchases and inventories held by first-buyers on specified dates during the 1958 market season

Date	Inventories	Purchases	Inventories as percentage of purchases
	1,000 bags	1,000 bags	Percent
Oct. 13	0.6	6.0	10.0
Oct. 27	3.2	60.4	5.3
Nov. 10	70.2	360.6	19.5
Nov. 24	235.8	849.6	27.8
Dec. 8	442.8	1,336.2	33.1
Dec. 22	561.3	1,592.2	35.3
Jan. 3	572.6	1,698.7	33.7

Source: Biggs, G. W., King, R. A., and Jones, E. W. Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 555, Oct. 1962.

Table 12.--Inventory of farmers' stock peanuts held by first-buyers on selected dates, by size of firm, 1958 season

Date	Inventory	Holdings, as percentage of total inventory, of--		
		Small firms[1]	Medium firms[2]	Large firms[3]
	1,000 bags	Percent	Percent	Percent
Oct. 13	0.6	83.3	0.0	16.7
Oct. 27	3.2	26.2	10.5	63.3
Nov. 10	70.2	2.9	24.7	72.4
Nov. 24	235.8	2.9	24.2	72.9
Dec. 8	442.8	4.2	24.7	71.1
Dec. 22	561.3	5.3	25.4	69.3
Jan. 3	572.6	4.4	22.6	73.0

[1] Firms purchasing 2,000 to 14,999 bags during the season.
[2] Firms purchasing 15,000 to 26,999 bags during the season.
[3] Firms purchasing 27,000 bags or more during the season.

Of the large first-buyers, 88 percent reported inventories held at some period during the buying season. Approximately 62 percent of the medium buyers and 27 percent of the small buyers, reported inventories held at some period during the buying season.[4]

Each of the 45 stations appearing in the solution to model B has annual purchases of 27,000 cwt. or more. It is quite likely that two or more stations will be in operation at the larger assembly points. With roughly 200 stations in operation in the base period, it appears that 67 of them, one-third of this number, would not be too far out of line with the results of this analysis. Stated positively, the analysis suggests that a marketing system operating under optimum conditions would call for a two-thirds reduction in the number of stations, as compared with the number needed under the bag handling system of the base period.

[4] Biggs, G. W., King, R. A., and Jones, E. W. Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 555, Oct. 1962.

New Transportation Equipment

This study makes it clear that with the shift to bulk handling new transportation equipment will be needed. Under the bag handling system over half of all deliveries from the farm were within a distance of less than 5 miles.

The following tabulation shows the percentage of total deliveries made from the farm to buying stations within specified distances during the 1958 season:

Distance	Percentage of total deliveries from farm to buying stations
Under 5 miles	55.5
5-9.9	29.2
10-19.9	12.8
20 miles and over	2.5

Source: Biggs, G. W., King, R. A., and Jones, E. W. Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 555, Oct. 1962.

With a two-thirds reduction in buying locations, the average length of haul would be substantially increased.

Table 13.--Type and capacity of transportation equipment owned by peanut growers, by peanut acreage, 1958 season

Peanut acreage per farm	Truck		Auto or tractor trailer		Dryer trailer	
	Percentage of growers	Capacity	Percentage of growers	Capacity	Percentage of growers	Capacity
	Percent	Tons	Percent	Tons	Percent	Tons
Under 25	46.9	1.0	27.4	1.7	0.9	1.5
25 to 74.9	85.7	1.7	30.8	2.8	.0	--
75 or more	95.5	2.2	3.8	2.4	1.4	12.6

Source: Jones, E. W., King, R. A., and Biggs, G. W. Marketing Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 595, April 1963.

Three-fourths of all deliveries were made in growers' vehicles.[5] The rest were made in buyers' trucks, with 2 percent made in trucks leased by buyers. While the majority of growers had equipment suited to bag deliveries, it is clear that neither the type of vehicle nor its capacity is adequate for bulk deliveries (table 13). No estimate of the added investment in transportation equipment was made in this study, although the cost of transportation from farm to buying station would be an important consideration in developing a marketing system along the lines suggested by this study.

Adjustments Required of Buyers

As the number of buying stations is reduced, some peanut buyers will find it necessary to discontinue their peanut-buying operations. This process will probably be gradual and not as severe a shock as at first it might appear, because almost 90 percent of the first-buyers are engaged in other activities in addition to buying peanuts.

In the base period, the size of buyers' businesses varied widely. Some were growers who merely bought peanuts during a 6-week period. Others were full-time businessmen who were in the fertilizer, feed, or some other type of business. These first-buyers frequently made available more than one service to peanut growers.

Fifty-one percent of the first-buyers bought peanuts and sold production supplies to peanut growers, but did not buy other products. Thirty-six percent of the first-buyers sold production supplies and bought products other than peanuts from growers. Only 13 percent of the buyers purchased peanuts only.

The following tabulation shows the production supplies and services made available to peanut growers by 77 first-buyers during the 1958 market season:

Supplies and services made available to growers	Proportion of buyers providing supplies and services
	Percent
Selling used bags	67.5
Selling fertilizer	51.9
Selling seed peanuts	37.7
Shelling seed peanuts	37.7
Selling new bags	35.1
Making cash loans	10.4
Drying peanuts	10.4
Picking peanuts	10.4
Furnishing groceries	9.1
Other	1.3

Source: Biggs, G. W., King, R. A., and Jones, E. W. Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 555, Oct. 1962.

[5] Biggs, G. W., King, R. A., and Jones, E. W. Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 555, Oct. 1962.

One-third of the first-buyers purchased products other than peanuts from growers. Soybeans, corn, and cotton were most frequently combined with peanut purchasing. All firms that purchased products other than peanuts also sold production supplies to peanut growers. Other farm products purchased by 26 first-buyers during the 1958 season and the proportion of buyers making purchases are shown in the following tabulation:

Other farm products purchased	Proportion of buyers making purchases
	Percent
Soybeans	29
Corn	21
Cotton	17
Livestock and poultry	12
Small grains	8
Melons	4
Tobacco	4
Hay	4
Snap beans	4

Source: Biggs, G. W., King, R. A., and Jones, E. W. Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 555, Oct. 1962.

The range of activities carried on by peanut buyers is further emphasized by the uses made of buildings owned by the first-buyers. The buildings of those interviewed were used an average of 7.2 weeks for peanut buying, 9.5 weeks for peanut storage, 21.8 weeks for other purposes, and were idle an average of 13.5 weeks during the 1958 season.[6]

With larger but fewer buying stations in the area, the activities of these buying stations must be coordinated more closely with the operations of processors. It may be necessary for first-buyers and principals to make new arrangements. Arrangements which the buyer survey revealed may be effected are those pertaining to (a) types of contracts, (b) means of compensation, (c) multiple principal relationships, and (d) the financing of purchases.

[6] Biggs, G. W., King, R. A., and Jones, E. W. Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 555, Oct. 1962.

Eighty-four percent of the contracts between first-buyers and principals were oral contracts. When first-buyers are involved in a much larger operation, a written contract may be advantageous to both the buyer and the principal.

Ninety-seven percent of the 80 first-buyers were paid on a commission basis; the remaining 3 percent were paid a straight salary. The commission was based on a fixed rate per bag or cwt. of peanuts. As buyers purchase larger quantities, both the base and rate of commission may require modification. An increased use of salaried buyers might be expected.

Forty percent of the first-buyers represented more than one principal.

The following tabulation shows the number of principals represented by first-buyers and the proportion of first-buyers representing them.

Number of principals represented	Proportion of first-buyers representing principals
	Percent
1	58.9
2	32.5
3	6.2
4	0.0
5	1.2
Independent[1]	1.2

[1] Purchased directly from growers and resold to different shellers.

Source: Biggs, G. W., King, R. A., and Jones, E. W. Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area. U.S. Dept. Agr., Mktg. Res. Rpt. 555, Oct. 1962.

One reason for this situation was that many buyers operated under contracts that permitted the principal to request the buyer to discontinue buying at any time. Buyers representing two or more principals could continue

Bagging of farmers' stock peanuts as they come from stationary thresher.

to buy peanuts if they were instructed by one principal to discontinue purchasing activity.

Grower goodwill is an important factor in a buyer's ability to secure peanuts. If a buyer is unable to purchase a grower's peanuts at a particular time, he may not be able to handle that grower's peanuts the next season. It is likely that multiple principal relationships would be reduced if principals were represented by larger but fewer first-buyers.

Seventy percent of the buyers were supplied funds in advance by their principals for the purchase of peanuts. In several other cases, where buyers were located near shelling plants, the principals drew checks in favor of the growers when they received the weight slips from the buyers. If the number of buying stations were reduced, principals would find it necessary to supply more funds to a given buyer. These additional funds might be an important consideration in their choice of buyers.

signed for custom harvesting on the part of the buyer. These contracts, though not requiring the grower to sell to the buyer rendering the service, would give the buyer a way of maintaining personal contacts with peanut growers and thus have a beneficial effect on volume of peanuts marketed.

Many small farmers will be unable to purchase the necessary equipment for bulk handling. This affords an opportunity for custom work on the part of peanut buyers and others in the community. By harvesting peanuts for several small growers, buyers can utilize this expensive equipment over a longer period of time.

The same is true for the drying operation, which is necessary with harvesting and hauling in bulk. One of the difficulties with artificial drying is that it must be properly controlled to preserve the quality of the peanuts. When the drying process is strictly controlled, the quality of the artificially dried peanuts can be improved.

Bulk handling of peanuts. Combine dumps bulk peanuts into truck during harvest.

Buyers who remain in the industry and operate bulk-buying stations need to consider ways of reducing uncertainty with respect to business volume. In a normal year, uncertainty concerning volume may come from two sources: (1) the quantity of peanuts brought in by peanut growers and (2) the fact that the principal may request the buyer to discontinue buying at any time.

Peanut buyers might insure some minimum volume by signing contracts with growers to provide marketing services such as artificial drying or hauling peanuts from farm to buying station. Since artificial drying is required where the latest techniques in bulk harvesting are used, it is a service which might logically be rendered by peanut buyers. The hauling of peanuts from the farm to the buying station in buyers' trucks would eliminate tying up growers' trucks and drivers. It is also possible that contracts could be

In 1958, buyers were hauling approximately one-fourth of the peanut crop from the farm to the buying station. If the number of buying stations were reduced and peanuts were hauled a greater distance, peanut buyers and other dealers could expand their hauling operations.

The buyers who build bulk handling facilities may speed the recovery of their high initial cost by making full use of the facilities. It may be possible to use the bulk station for other products, such as small grains, when the facility is not in use for peanuts. The facility could be planned so that other products may be stored in the off season, as was done in many instances at buying stations which bought peanuts in bags.

Some buyers may find it advantageous to pool their resources to build a bulk handling station. They could maintain their individual identities in buying peanuts and use the buying

station jointly or operate it as a partnership. Merger would not only increase the ability to raise capital but might also bring to the buying station the volume necessary for the station to be operated at lower unit costs.

Merger may result in expansion of buyer services to growers. It may be possible to maintain more personal contacts with growers, which has been an important factor in securing peanuts. Mergers would also decrease the number of peanut buyers that would be displaced in reducing the number of buying stations.

Adjustments Required of Growers

Under the bulk marketing system, close personal contacts between buyers and farmers will be limited. Preliminary contacts with alternative buyers should be made well in advance of harvest to select a market and schedule deliveries. Procedures whereby grades could be approximated on the farm before the peanuts are moved would put the farmer in a position to bargain with the buyer for a specific price. Many bulk peanut buyers at the present time haul peanuts for farmers and offer drying services at receiving stations. Since economies of size are associated with both of these functions, owners of small farms might find this practice best for them. It may also be desirable for some growers to provide custom harvesting services. There are several ways by which farmers may adopt the new techniques of harvesting and drying peanuts, including purchasing equipment or hiring it on a custom basis. Studies indicate it will pay to have peanuts harvested on a custom basis on farms allotted 25 acres or less. With as much as 32 acres, a farmer will find it pays to purchase windrow harvesting equipment. Since a high percentage of farmers in the Virginia-North Carolina area have less than 25 acres, custom harvesting seems to be an appropriate alternative. The equipment to be used for custom harvesting could be provided by private individuals or purchased cooperatively.

Storage of peanuts in bags at a Virginia processing plant.

1,000 tons of bulk peanuts waiting to be shelled.

The adjustment for many farmers will involve increasing the size of operations so that harvesting equipment can be purchased and used to capacity. Economies of size are also associated with drying equipment, hauling equipment, and storage facilities. As the transition is made to mechanized harvesting, drying, and bulk marketing, the acreage on many farms will need to be increased. At the present time a farmer must purchase an entire farm in order to expand his peanut acreage allotment.

Growers interviewed in the survey favored cooperative activity in marketing peanuts. About 50 percent of the farmers in the survey area believe that higher prices could be secured for peanuts if sold by cooperatives. Only 28 percent felt that the individual could bargain as effectively with first-buyers as a cooperative. It seems reasonable to assume that small farmers might be able to bargain more effectively by pooling their peanuts. The extent to which price could be influenced, however, would depend largely upon the percentage of growers who became members of a cooperative. Also, a cooprative can do more than bargain for price.

Although the transition to bulk handling is proceeding at a fairly rapid rate, it appears that many sections will not have access to facilities in the near future. Bulk storage facilities for peanuts going under loans granted by the Commodity Credit Corporation (CCC) have been limited. Many farmers indicated that the Peanut Growers Cooperative Marketing Association (PGCMA) should provide additional bulk storage for CCC peanuts. About 38 percent indicated that they would sign an agreement to deliver a specific proportion of their crop to the PGCMA if such facilities were provided.

Storage facilities provided cooperatively would not necessarily have to be limited to peanuts under CCC loan. Nearly 85 percent of the farmers in the survey area thought that peanuts could be stored more economically by the PGCMA. Such storage could be

used merely for the purpose of orderly marketing. The cooperative could handle sales from such storage facilities, or an arrangement whereby farmers themselves would reclaim their peanuts and sell them at a later date could be developed.

Another possibility would be to further integrate production with marketing. If growers should delegate more of the marketing decisions to buyers or to a cooperative, both parties might benefit. Harvesting, drying, and hauling may be done under contract as buyers or a producer-owned cooperative extends additional services to peanut growers. This could result in a more timely harvesting and handling of the crop in such a manner as to preserve quality and at the same time increase returns to growers. This could be accomplished through efficiencies resulting from more closely coordinated marketing and production decisions. For instance, this could result in the first-buyer or a cooperative serving a wider area more effectively because they could coordinate decisions so as to have a more orderly flow of peanuts from the farm to the buying station.

Growers could sell peanuts on the farm, a procedure followed in the past. However, this would be a marked change from the present practice of selling at the buying station. When surveyed in 1958, 70 percent of the first-buyers cited disadvantages of purchasing peanuts at the farm. The one given the most emphasis was that of improper grading on the farm. Advantages cited were the convenience to growers and the knowledge of prices before peanuts are moved from the farm.

A buyer or a cooperative purchasing peanuts in the field might do the harvesting. This would provide control over the harvesting operation and at the same time relieve the grower of considerable responsibility. Growers would not have to invest in expensive harvesting and drying equipment and would be relieved from recruiting the labor needed to harvest the peanuts. This arrangement might be particularly suited to small growers.

Other Publications Available

Fresh Fruit and Vegetable Marketing Organizations in the Northeastern and Central States, General Report 84. Martin A. Blum.

Pooling and Other Grower Payment Methods as Used by Local Fruit, Vegetable, and Tree Nut Cooperatives, General Report 67. Clyde B. Markeson.

Co-ops Have a Place in Rural Community Progress, Information 23.

Marketing Virginia White Potatoes: Buyers' Preferences and Practices, Marketing Research Report 682. Harold K. Jolley and Frank W. Bell.

Economic Aspects of Marketing Florida Avocados, Marketing Research Report 614. Clyde B. Markeson.

Marketing Farmers' Stock Peanuts in the Virginia-North Carolina Area, Marketing Research Report 595. E. Walton Jones, Richard A. King, and Gilbert W. Biggs.

Buying Farmers' Stock Peanuts in the Virginia-North Carolina Area, Marketing Research Report 555. Gilbert W. Biggs, Richard A. King, and E. Walton Jones.

Coordinated Marketing for Florida Fresh Citrus Shippers: Views on its Need and Feasibility, Marketing Research Report 492. Fred E. Hulse.

Economic Considerations in Marketing Sweetpotatoes from the Eastern Shore of Virginia, Marketing Research Report 487. Clyde B. Markeson, Frank W. Bell, and Leo F. Zimmerman.

A copy of each of these publications may be obtained upon request while a supply is available from:

Farmer Cooperative Service
U.S. Department of Agriculture
Washington, D.C. 20250