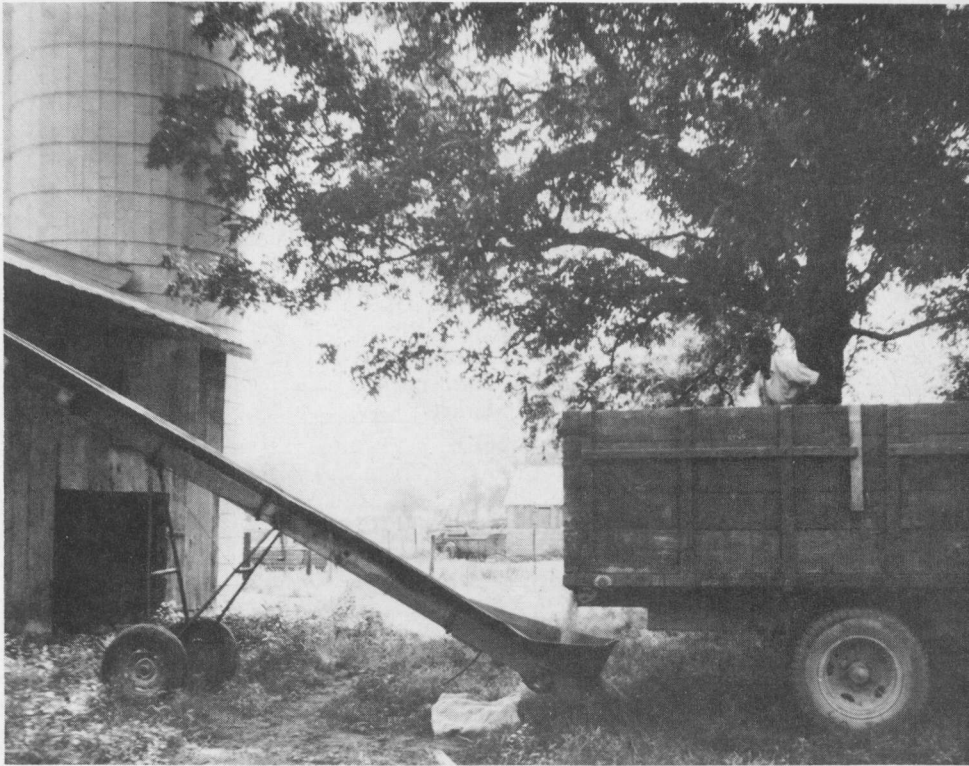


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# PROCUREMENT of CORN in ALABAMA



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# PROCUREMENT of CORN in ALABAMA\*

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## INTRODUCTION

**S**IGNIFICANT CHANGES have taken place during recent years in Alabama's feed-grain and meat-producing industries.

Economies have been gained through increased specialization in grain production and in livestock and poultry production by enlarging size of enterprises. Livestock and poultry production has increased, whereas corn production has remained about the same during the past decade, Tables 1 and 2. The poultry industry has expanded tremendously since 1950. With these developments in the feed-grain using industries has come a corresponding increase in corn utilization and procurement. Acquisitions of corn have been primarily from grain surplus areas of the Corn Belt.

The widening gap between corn production and utilization in Alabama has focused major attention on movement of corn from surplus-producing areas. Feed-grain users need information on which to base decisions relative to methods, means, and sources of acquiring corn.

Relationships change between corn prices at major markets in supply areas and those at markets in consumption areas. These changes are sometimes drastic and may occur in a short period of

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TABLE 1. ACREAGE, YIELD, AND PRODUCTION OF CORN ON FARMS REPORTING CORN HARVESTED FOR GRAIN, ALABAMA, 1949 AND 1959

Item	Unit	1949	1959	Percentage change
				<i>Per cent</i>
Farm reporting corn harvested for grain.....	Number	169,251	83,851	-50
Corn.....	Acres	2,299,479	1,672,087	-27
Corn per farm.....	Acres	13.6	19.9	46
Total production.....	Bushels	40,972,309	41,818,654	2
Production per farm.....	Bushels	242	499	106
Yield per acre.....	Bushels	17.8	25.0	40

Source: U.S. Bureau of the Census, *United States Census of Agriculture*, 1950 and 1960.

TABLE 2. NUMBER OF LIVESTOCK AND POULTRY ON FARMS, ALABAMA JANUARY 1, 1951, 1956, AND 1961

Class	1951	1956	1961	Percentage change 1951-1961
				<i>Per cent</i>
Cattle and calves.....	1,375,000	1,743,000	1,656,000	20
Milk cows <sup>1</sup> .....	403,000	380,000	262,000	-35
Chickens <sup>2</sup> .....	7,454,000	6,381,000	8,460,000	13
Hogs and pigs.....	1,250,000	1,061,000	972,000	-22
Sheep and lambs.....	21,000	110,000	31,000	48
Turkeys.....	45,000	40,000	80,000	78
Commercial broilers <sup>3</sup> .....	16,655,000	82,473,000	198,036,000	1,089

<sup>1</sup> Cows and heifers, 2 years old and over kept for milk included in cattle and calves.

<sup>2</sup> Excludes commercial broilers.

<sup>3</sup> Production during the year, including consumption in households of producers which is less than 1 per cent of production.

Source: Alabama Crop and Livestock Reporting Service, *Alabama Agricultural Statistics*, Bulletins 10 and 11.

time. This instability in prices makes decisions difficult relative to buying and selling corn. Imperfections in market organization and structure may exist if there are wide fluctuations in seasonal and locational patterns of prices received and paid. Information in this report should aid in providing a basis for making adjustments that will result in a reduction in the frequency and severity of market imperfections.

### Objectives

The overall purpose of this study was to gain insights into the procurement structure of Alabama corn market. Specific objectives were: (1) to describe the sources and prices involved in purchasing corn, (2) to determine the costs of procuring corn,

(3) to develop a least-cost model for purchasing corn, and (4) to study advantages and disadvantages of purchasing locally produced corn and purchasing imported corn.

Primary data herein were obtained through the use of a prepared questionnaire and personal interview with 290 farmers in northern Alabama selected by using cluster sampling techniques and from 53 millers and elevators in Alabama selected by using a stratified random sample.

### Justification

Corn is of major importance in Alabama's agricultural economy. Corn has occupied more cropland acreage during recent years than any other row crop, Table 3. Despite this large acreage, huge

TABLE 3. ACRES OF CROPLAND HARVESTED, SELECTED CROPS, ALABAMA, 1951, 1956, AND 1961

Item	Acreage harvested			Percentage change 1951-1961
	1951	1956	1961	
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Per cent</i>
Corn (all).....	2,490,000	2,198,000	1,523,000	-39
Wheat (grain).....	7,000	80,000	56,000	700
Oats (grain).....	42,000	136,000	85,000	102
Soybeans.....	155,000	151,000	167,000	8
Cotton.....	1,490,000	972,000	905,000	-39
Peanuts.....	377,000	244,000	212,000	-44
Hay.....	705,000	660,000	499,000	-29

Source: Alabama crop and Livestock Reporting Service, *Alabama Agricultural Statistics*, Bulletins 10 and 11.

quantities of corn have been imported into Alabama to support the feed and meat producing industries in the State. Alabama is a grain-deficit area, and prices normally fluctuate through wider ranges in areas where a commodity is produced in inadequate amounts.

Sources of corn purchases and methods of transportation change when corn prices and/or transportation charges change. This must be recognized when seeking the least-cost procurement alternative.

## VOLUME MOVEMENTS

### Corn Movements

In recent years corn has been purchased in relatively large volumes throughout the year by grain-handling firms in Alabama. A major portion of the corn purchased was imported from the

TABLE 4. VOLUME MOVEMENTS OF CORN BY METHOD OF TRANSPORTATION, ALABAMA, 1959 AND 1960

Movement	Barge <sup>1</sup>		Rail <sup>2</sup>		Truck <sup>3</sup>	
	Thousand bushels					
	1959	1960	1959	1960	1959	1960
Inshipments	29,279	34,151	15,532	5,639	2,214	3,558
Outshipments <sup>4</sup>	81	279	379	3,000	1,574	1,404

<sup>1</sup> Composite data from Corps of Engineers and this study.

<sup>2</sup> Table 7.

<sup>3</sup> Based on data from this study. However, the outshipment data for truck were greatly underestimated because of failure to obtain information from important grain handling firms.

<sup>4</sup> In 1959 and 1960, corn exports at Mobile, Alabama by ocean-going vessels amounted to 14.0 and 7.5 million bushels, respectively.

Corn Belt and used mostly in broiler and laying mash. Locally produced corn was purchased, in general, from farmers within a short hauling distance of the firms.

Corn was imported by barge, truck, and rail; whereas, locally produced corn was moved to market only on trucks, Table 4. Outshipments were made by all three methods of transportation. Furthermore, outshipments were made from Mobile by ocean-going vessels.

### Purchases of Corn

**Imported Corn.** Quarterly purchases of imported corn by firms in Alabama were greatest during the October-December quarter, Table 5. Purchases during summer months were lowest with almost equal proportions occurring in the April-June and July-September quarters. Large imports during the harvest season resulted from millers and elevators filling available storage space.

TABLE 5. PERCENTAGE OF IMPORTED CORN AND LOCALLY PRODUCED CORN PURCHASED, BY QUARTERS, ALABAMA, 1959 AND 1960

Year	Quarter			
	January-March	April-June	July-September	October-December
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
<i>Imported corn</i>				
1959	25	18	21	36
1960	26	17	20	37
<i>Locally produced corn</i>				
1959	15	6	24	55
1960	15	7	21	57

**Locally Produced Corn.** Purchases of locally produced corn by grain handlers were concentrated during the harvest season. Data in Table 5 indicate that approximately 55 per cent of locally produced corn was purchased during October through December. Moreover, when the data were regrouped and those for September through December combined, almost three-fourths of the locally produced corn was purchased during this 4-month period. Locally produced corn accounted for only about 15 per cent of the total corn purchased by grain handlers in Alabama.

### **Inshipments and Outshipments**

Approximately 85 per cent of all corn purchased by grain handlers in Alabama in 1959 and 1960 came from sources outside the State. Considering the two years together, Illinois was the leading source of corn. In 1959, however, Iowa was the individual leader. Missouri also was an important source of corn for Alabama in both years.

Shipments of corn from Alabama went primarily to surrounding states. Georgia was an important receiver and accounted for a major portion of the outshipments in 1959 and 1960. In terms of total shipments of corn received from firms in Alabama, Florida ranked second in both years. Mississippi and Tennessee exchanged third and fifth places respectively from 1959 to 1960. For both years Louisiana ranked fourth.

### **Methods of Transportation**

**Barge.** The percentages of corn shipped into Alabama by barge were approximately 60 per cent in 1959 and 80 per cent in 1960. More than three-fourths of the corn shipped into Alabama from Illinois and from Missouri was shipped by barge. This was true in both 1959 and 1960. Major points for barge imports were along the Tennessee River at Guntersville, Decatur, and Sheffield. Three-fourths of all barge imports of corn were received at Guntersville. Also, it was from this point that large volumes of corn were shipped into Georgia by truck. Barge receipts of corn at Decatur and Sheffield remained primarily in Alabama. Small amounts of barge outshipments were made from Decatur and Guntersville.

Barge shipments of corn were also received at Mobile. Slightly more than 4 million bushels of corn arriving by barge at Mobile each year were exported. Exports of corn at Mobile were made in ocean-going vessels.

**Truck.** Corn shipped into Alabama by truck came from St. Louis, Missouri; Peoria, Centralia, and Cairo, Illinois; Evansville, Indiana; Davenport, Iowa; and Cincinnati, Ohio. These direct truck movements from the Midwest went primarily into southern Alabama with a lesser amount going into central Alabama. Among destinations in Alabama for corn shipped direct from the Corn Belt by truck were Mobile, Enterprise, Geneva, Atmore, Montgomery, Demopolis, Eufaula, and Greensboro.

From barge points in Alabama along the Tennessee River, corn was moved by truck to various points in northern Alabama, and large quantities of corn were transported by truck from Guntersville, Alabama, to Gainesville, Georgia. Other important truck shipments from this barge point went to various points south and west of Gainesville. Most of the corn transported into Georgia by truck was loaded at Guntersville, but the volume involved was not ascertained.

**Rail.** More than 90 per cent of the corn shipped to Alabama from Iowa, the second most important source, arrived via rail. Railroads were used to transport corn to Birmingham, Montgomery, Selma, Tuscaloosa, and to other points where transit privileges were beneficial.

Outshipments of corn by rail were minor in 1959. Most corn shipped in by rail remained in Alabama or was shipped out by a different method of transportation or in a different form. In 1960, however, almost the same quantity shipped in by rail was shipped by rail out-of-state or to another point within the State, Table 6.

TABLE 6. VOLUME MOVEMENTS OF CORN BY RAIL, ALABAMA, 1959-60

Movement	Thousand bushels	
	1959	1960
To Alabama.....	15,532	5,639
From Alabama.....	379	3,000
Within Alabama.....	1,396	2,421

Source: Tennessee Valley Authority, *Alabama Interstate and Intrastate Rail Movements of Grain and Grain Products, 1948-1960*, February 1963.

## TRANSPORTATION

Transportation was a key factor in bringing about a balance between supplies of and requirements for corn in a given area. Physical characteristics of corn made possible the use of three



major methods of transportation—barge, truck, and rail. The amount and kind of transportation used was influenced by rates, services provided, and speed. These factors were highly variable among the several means of transportation. They were related to total costs of transportation; therefore, they affected prices received and paid for corn and corn products.

As far as a particular method of transportation was concerned, a first step was to extend facilities to both corn surplus and corn deficit areas. Once facilities were made available, the transportation process became one of continuous maintenance and improvement to lower costs and increase services.

### **The Changing Systems**

In recent years, inland waterway channels and highways have been improved and extended. Technological advances in marine equipment and navigation aids for barges, and in engineering improvements for trucks and trailers to carry more payload, have increased the economic effectiveness of transporting corn by water and truck. Extensive development of waterway and highway systems has facilitated the movement of corn by barge and truck to widespread consuming areas.

Railroads have adopted electronic switching yards, closed circuit TV for more efficient car control, hydraulic power transmission, mechanized track maintenance, more efficient loading and dumping hopper cars, and the diesel engine. Perhaps the most recent publicized innovation has been that of larger capacity cars, such as the "Big Johns." "Big Johns" can carry larger payloads than the old type car at greatly reduced costs.

Each improvement in transportation has been of indirect benefit to both producer and consumer. Marketing costs have been reduced, thus permitting higher prices to the producer and lower prices to the consumer. At the same time, marketing horizons have expanded.

In corn marketing and procurement, the important concern has been which combination of transportation facilities could best do the job of moving corn for the lowest cost. Barge and rail transportation have been thought of as the human arteries and veins, while trucks were the capillaries. All three methods have been necessary to provide an effective means of transporting corn.

### Availability of Transportation

The three methods of transportation were available only to a limited number of firms in Alabama in 1959-60. Having water routes extending to all facilities was an impossibility. Motor carriers were available to most areas in the State. Rail served only those facilities where there was a substantial volume of other freight.

**Barge.** Receipt and shipment of corn by barge were limited to firms located along the Tennessee River and Mobile Bay. The major barge points were Guntersville, Decatur, Sheffield, and Mobile. All firms located at these points were capable of handling corn by barge. The number of points capable of handling grain by barge will increase if and when the Alabama-Tombigbee Waterway and the Coosa River are linked with the Tennessee River.

**Truck.** Motor truck was the most widely used method of transportation. In fact, all firms were equipped to handle truck receipts and shipments, and at the same time motor transport was available to them. Moreover, motor truck was the only method available to over half of the firms. All custom grinders were capable of handling only truck shipments and receipts.

**Rail.** Rail was available to only 41 per cent of the firms. However, more than 80 per cent of the feed manufacturers were able to receive boxcar and hopper car receipts, and two-thirds indicated that they could ship by this method. About one-third of the elevator operators could ship and receive by rail while half of the feed mixers indicated that they had facilities for rail shipments and receipts. Slightly less than half of the firms that handled rail traffic were capable of handling hopper cars.

### Factors Influencing Transportation

Numerous factors influenced the use of various methods of transportation. Important ones were: size of a single shipment for barge, highway transportation barriers and the interstate highway system for truck, and transit privileges for rail. For specific shipments, one or more of these factors determined the method of transportation.

**Size of Barge Shipments.** Grain was shipped in barges carrying from 26,000 to 50,000 bushels of corn. The capacity for a stand-

ard barge was 33,000 bushels of corn while the capacity of a jumbo barge was 50,000 bushels. The average number of barges per tow was 12. In one shipment, however, as many as 22 barges were included. A tow of 12 standard barges filled to capacity carried 396,000 bushels of corn. Moreover, a shipment of 12 jumbo barges filled to capacity transported 600,000 bushels of corn. These facts pointed up the importance of barges transporting large quantities of corn on waterways to serve grain handlers located on navigable rivers.

**Highway Transportation Barriers.** Variations in length, height, and weight restrictions among states presented a difficult problem to motor carriers. In effect, truckers were forced to operate trucks and to haul payloads that did not exceed the lowest maximum restrictions established by any state through which they traveled while transporting grain. Established weight limits varied as much as 70 per cent among states in which trucks traveled in moving corn from the Midwest to Alabama.<sup>1</sup> Trucks moved long distances with unfilled capacity when a short segment of the route was in a state that had a relatively low maximum weight limit. Restrictions on trucks have been justified for protection of highways, but have reduced the competitive potential of trucks as a means of transportation for corn.

**The Interstate Highway System.** The Federal Highway Act of 1956 authorized construction of 40,000 miles of interstate and defense highways. At the same time, Federal funds were increased for construction of primary, secondary, and urban roads. The Interstate Highway System is to be financed by 90 per cent Federal government contribution, matched by 10 per cent from the state within which the road is to be built. Considerable progress has been made in building the Interstate Highway System.

Producers, haulers, and users of corn should benefit materially from use of the Interstate Highway System. Shorter routes and better roads contribute to lower trucking costs and reduced transit time. An improved highway system can contribute to more stable market conditions. As transportation systems are improved, the marketing system is improved.

**Rail Transit Privileges.** Rail transit privileges allow the stopping of a shipment for purposes of storage, milling, or other pro-

<sup>1</sup> *Watch Your Weight* (Washington: Truck-Trailer Manufacturers Association Inc., 1950).

cessing between origin and destination. Rail was the only transportation method that provided transit privileges to patrons. Transit privileges were of lesser importance where competitive methods of transportation were available; however, some corn users had no need for transit privileges.

Transportation by rail was available to only 41 per cent of the firms in Alabama. Of the firms with rail capability, 82 per cent had transit privileges. However, only 39 per cent of the firms having transit privileges made use of them. Yet, all firms using transit privileges were influenced in locating the plant by the availability of transit privileges.

### Transportation Rates

**Barge.** Barges transported corn on the navigable waterways at low per unit costs. However, barges served extremely limited areas for procurement and delivery of corn. Where the situation permitted barge traffic, barges were highly effective in transporting corn.

Barge rates can be obtained from transportation companies hauling grain on navigable waterways. Where rates are not available, the following equation can be used in estimating barge rates from points in the Midwest to points along the Tennessee River in Alabama:

$$Y_b = 0.6110 + 0.0134X^2$$

Barge rates between selected points are in Table 7.

TABLE 7. BARGE RATES FOR CORN FROM SELECTED POINTS VIA MISSISSIPPI-TENNESSEE RIVER NETWORK TO SELECTED POINTS IN ALABAMA, JANUARY 1962

From	Cost per bushel to:		
	Mobile	Decatur-Guntersville	Sheffield
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Kansas City.....	14.78	13.58	13.05
Omaha.....	19.43	18.23	17.70
St. Louis.....	8.96	6.69	6.16
Minneapolis.....	15.26	12.99	12.46
Louisville.....	9.97	7.98	7.45
Cairo.....	8.60	6.33	5.80
Davenport.....	12.68	10.42	9.88
Chicago.....	12.71	10.44	9.91

Source: Arrow Transportation Company, *Guide to Published Barge Rates on Bulk Grain*, Schedule No. 3, January, 1962.

<sup>2</sup>  $Y_b$  = cents per bushel;  $X$  = river mileage.

**Truck.** Truck rates were not published for transporting unregulated commodities such as corn. Trucks varied in size. Payloads even varied on trucks of the same size. Usually, the dual wheel short truck was most economical in hauling corn short distances. A tractor pulling a tandem trailer hauled corn long distances cheaper than the short truck.

Rates charged by truckers were highly variable. In fact, variation was so great among rates reported in Alabama that an estimating equation was not reliable. However, when truck rates for the Southeastern United States were compiled and analyzed, a very reliable estimating equation, was obtained.

The equation developed for trailer trucks from regression analysis of regional data was:<sup>3</sup>

$$Y_{t1} = 2.45112 + 0.04896X$$

$Y_{t1}$  = cents per bushel

$X$  = highway mileage

Estimated truck rates for transporting corn from selected points in the Midwest to selected points in Alabama are presented in Table 8.

Since actual data to represent short hauls were not available, an equation was developed from budgeted data to represent costs

TABLE 8. ESTIMATED TRUCK RATES FOR CORN FROM SELECTED POINTS IN MIDWEST TO SELECTED POINTS IN ALABAMA, 1962

From	Cost per bushel to:					
	Guntersville	Decatur	Birmingham	Montgomery	Brunswick	Dothan
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Cairo.....	17.04	14.98	19.15	23.89	26.64	29.48
Chicago.....	32.56	30.50	34.67	39.41	42.16	45.00
Kansas City.....	36.18	34.13	37.80	42.55	45.29	48.13
Louisville.....	17.82	16.16	20.32	25.07	27.81	30.65
Minneapolis.....	44.75	43.04	53.61	58.36	61.10	63.94
Omaha.....	45.88	43.82	47.98	52.73	55.47	58.31
Peoria.....	31.19	29.13	33.29	38.04	40.79	43.63
St. Louis.....	24.19	22.28	26.44	31.19	33.93	36.77

<sup>3</sup> Based on work conducted cooperatively by the Agricultural Experiment Stations of Alabama, Arkansas, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee, and the U.S. Department of Agriculture and Tennessee Valley Authority.

of short hauls by short trucks. The equation derived was:

$$Y_{ts} = 0.11637 + 0.10872X$$

$Y_{ts}$  = cents per bushel for short trucks

$X$  = highway mileage

Estimates used in deriving this equation were current costs. Also, a basic assumption was made that the truck hauled 6 tons of net payload one way. Truck rates for origins at barge points Sheffield, Decatur, and Guntersville, and destinations in Alabama are illustrated in Figure 1.

Truck rates estimated by using these equations should be used only as guides. When the rate was lower than that estimated from the equation, transportation at the lower rate was usually a wise purchase. Backhauls rates in many situations were less than those obtained by using the estimating equations.

Truck competition was particularly effective when source points for corn were located on navigable waterways—for example, Guntersville and Decatur—and when corn was moved directly to a grain feeder. Also, truckers have been effective in hauling corn on backhauls.

Rates charged by truckers when transporting grain on a backhaul were usually reported as being sufficient to cover out-of-pocket costs. Charges above the level of out-of-pocket costs were influenced largely by competition from rail and from other truckers. In addition, truckers had tremendous unused capacity for backhauls of corn whereby additional corn could have been hauled at low rates. The problem of scheduling movements must be alleviated to utilize more fully this unused truck capacity at backhaul rates.

**Rail.** The rail freight rate structure has changed frequently during recent years, especially in the Southeast. The trend generally has been rising freight rates for most of the country. However, the trend in the Southeast has been toward lower rates. If ICC permits the Southern Railway System to ship corn at the requested "Big John" rates, further reductions in rates can be expected.

Reductions in rail rates for corn have made railroad transportation more competitive with trucks. Indications were that reductions in rail rates might have the effect of not only shifting shipments from truck to rail, but of causing a change in sources from which corn is purchased. However, truckers may lower

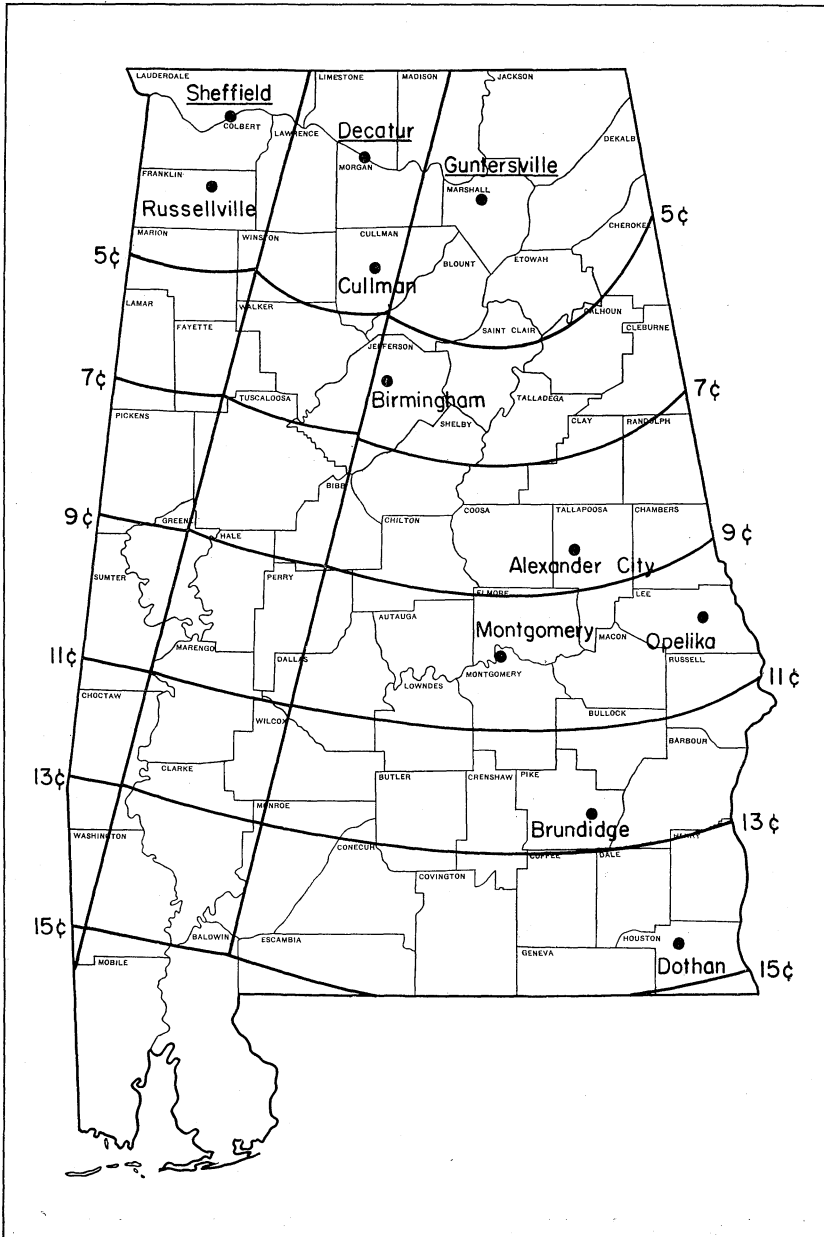


FIG. 1. The above map shows the estimated truck rates for corn per bushel to points in Alabama from Sheffield, Decatur, and Guntersville, 1962.

rates to meet competition, thereby offsetting all or part of the rail rate reduction.

In general, railroads offered two rates—flat or local—and through or transit balance rates. In determining rates for transporting corn, railroads regarded the movement of corn from the point of origin to the final consignee as a single movement. Corn may have been stopped as many as three times while in transit without additional charge. The rate for the first movement was a local or flat rate. When corn was moved from that point to another destination, the railroad treated this as a continuation of the original movement and a through rate from the origin to the second destination was applied. For the second movement, the receiver paid an amount equal to the difference between the flat rate charge and the charge based on the through rate. This difference was called a “transit balance.” When a series of movements was made, the transit balance for each successive movement was the difference between a charge based on through rate to the new destination and the sum of all previous charges.

The proportional rate, in essence, was a variation of the transit balance rate. When corn was transported across a recognized territory boundary, the freight rate changed. In the case of corn being shipped from the Midwest to the Southeast, the Ohio and Mississippi rivers were the boundaries. The proportional rate was a substitute for the transit balance because no through rates were published from country points in the Midwest to destinations in the Southeast.

A proportional rate did not stand alone. It had to be preceded by a local rate that was effective over the distance between the origin and the first destination. Thereafter, one or more proportional rates were applied in sequence.

**The “Big John” of Southern Railway System.**<sup>4</sup> In 1961, Southern Railway System petitioned the ICC for a drastic reduction in rates applicable to the movement of grain to the Southeast. The Southern Railway System proposed rates for corn transported in “Big John” hopper cars that were much below existing rates.

<sup>4</sup> Southern designed and built a covered-hopper car, called “Big John,” with a lightweight aluminum body to haul over 100 tons or 3,500 bushels of corn. A minimum load for this car is 90 tons. The old cars hauled 50 tons of corn which was only half the capacity of the new car. These air-tight “Big Johns” offered freedom from infestation and water damage. On its roof were 12 hatches, and at the bottom were 8 discharge hoppers to speed loading and unloading.



Action by ICC has been slow but permission has been granted Southern Railway to ship corn to a limited number of points at lower rates. However, a final ruling by ICC has not been made and it is probable that proposed rates will be revised.

The proposed rates were for grain shipped from the Corn Belt into The Southeast on Southern Railway from the important river crossing points of St. Louis, Missouri; Evansville, Indiana; Louisville, Kentucky; Cincinnati, Ohio; and Memphis, Tennessee. These points were where Corn Belt grain first came on Southern Railway. For selected points within the Southeast, the "Big John" rates applied also. These were for single and multiple (five or more) "Big John" carloads. Rates were relatively lower on movements qualifying as multiple car shipments. However, transit privileges were not available at "Big John" rates. The low rates permitted by "Big John" shipments will be most beneficial to land-locked grain users that do not need transit privileges for the major portion of their tonnage.

The "Big John" facilitates switching cars at origin, intermediate and destination points. This contributes to cutting costs because one 100-ton car takes the place of two 50-ton cars. Only one bill of lading is necessary for each lot of cars. Increased capacity, lightweight cars, multiple-car movements, and less paper work are factors that can contribute to lower transportation charges. Rail rates for selected points are presented in Appendix Tables 1, 2, and 3.

### **Comparison of Transportation Rates**

Transportation rates for moving corn into Alabama from various points varied considerably. Equations developed from transportation data exhibited definite relationships among methods, Figure 2.

Barge rates ( $Y_b$ ) were the lowest rates for moving corn where navigable waterways were available. For distances in excess of 250 miles, proportional rail rates ( $Y_{rp}$ ) were next lowest. Rates for trailer trucks ( $Y_{tl}$ ) and local rail rates ( $Y_{rl}$ ) were almost the same.

In comparing the two truck rate functions, short trucks ( $Y_{ts}$ ) were definitely cheaper for distances less than 40 miles. At distances greater than 100 miles, trailer trucks were cheaper than short trucks. Costs at distances between 40 and 100 miles depended largely on individual circumstances. In situations where

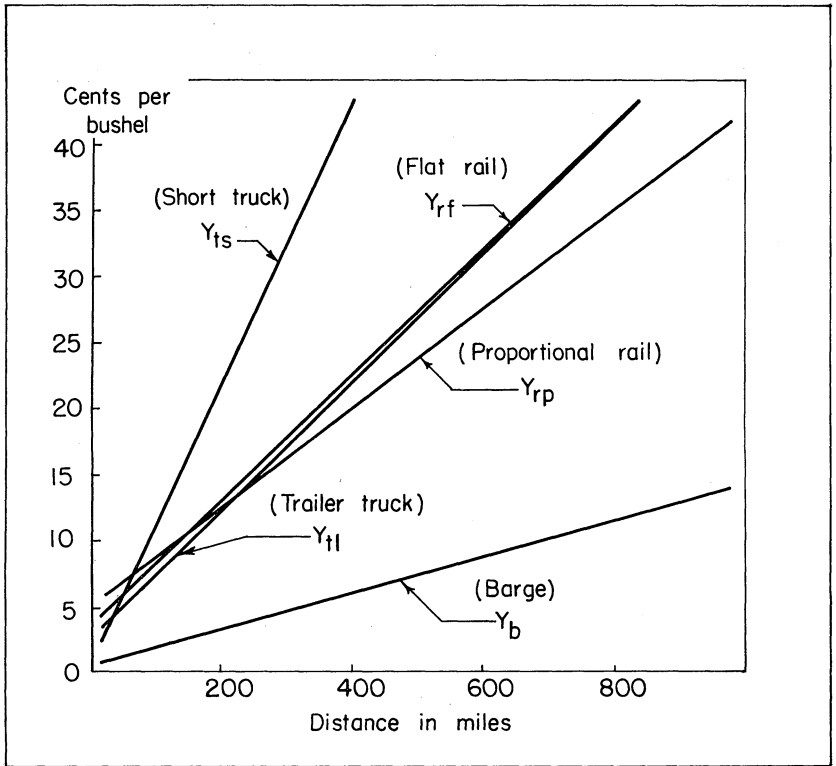


FIG. 2. Shown here is a comparison of transportation rates for selected methods of transporting corn, 1960-62.

barges were not available, combination barge-truck transportation was cheaper than rail because of the relatively low barge rates.

When transportation by barge was not available, the cheapest methods for selected distances are presented below.

<i>Distance</i>	<i>Cheapest mode</i>
Less than 40 miles	short truck
40 to 250 miles	trailer truck
Over 250 miles	proportional rail

Rail rates on corn shipped in bulk in single carloads via "Big John" hopper cars and Southern Railway System were lower than rates by other means for some origins and destinations. Of particular significance, rates for multiple car shipments by "Big John" were lower than barge rates from Louisville to Gunter, and from St. Louis to Decatur.

### Advantages and Disadvantages of Different Methods

**Barge.** The most important advantage gained from shipping corn by barge was the low cost of transportation. For grain handlers with barge facilities, the cheap barge rates provided an economic advantage over land-locked handlers. Also large volume shipments were reported frequently as an important advantage for barges.

Disadvantages reported for barge shipments were limited direction of movement and limited markets served by barge.

**Truck.** Truck advantages reported most frequently by grain handlers were: cheaper rates, small shipments, fast delivery, and flexibility.

Truck rates were cheaper than rail rates for a number of reasons. Trucks had less waiting time for loading and unloading. When corn was transported on a backhaul, truckers most frequently charged comparatively lower rates. Grain was used as a backhaul by both regulated and nonregulated motor carriers, since it moved as an agricultural exempt commodity. Another reason for cheaper rates was that trucks had lower fixed costs and did not provide transit privileges.

Fast delivery of small shipments was an important advantage of trucks for some grain handlers. This advantage was particularly helpful to operators with limited storage capacity and fast turnover. Trucks moved many small lots of corn that would not have been moved by other methods. Corn was delivered by truck in most instances within 24 to 48 hours.

Truck movements were very flexible. In certain situations, trucks moved corn directly to grain feeders. This flexibility of trucking permitted short hauls in a matter of hours.

Two of the major factors reported by some handlers as advantages were reported as disadvantages by other handlers. The basis for this counter reporting was due to location in relation to transportation systems and to the volume of business conducted. The factors were higher rates and small shipments.

Demands by truck operators that trucks be loaded or unloaded immediately was a disadvantage. Truckers often strongly insisted on immediate unloading upon arrival. Truckers felt that idle time was costly, and by operating at low rates trucks had to be kept moving. Too, the trucker was personally present to complain to the grain handler.

Another disadvantage was the unscheduled arrival of trucks. The grain handler could not arrange his operation to obtain desired efficiency from labor and facilities.

**Rail.** Major advantages reported by firms in Alabama for rail transportation were capacity to make large volume movements, loading and unloading at convenience of the elevator operator, and desirable service features. Other advantages of lesser importance were satisfactory weights and grades, and transit, storage and milling privileges.

The most frequently reported disadvantage was high rates charged by railroads. Lack of availability and poor condition of cars were also reported as being disadvantages of rail. Railroad service not being available to a greater number of firms was definitely a transportation limitation.

## PRICES

### Sources of Data

Price data for this study were for the 3-year period 1960-62. Prices received for corn by Alabama farmers were obtained from the Statistical Reporting Service, Montgomery, Alabama. These prices were mid-month prices received for corn, irrespective of grade, form or color. In most instances, prices received represented prices paid farmers for corn delivered to first buyers. The cost of delivering corn to first buyers was included in the revenue derived by farmers from the sales of corn.

Prices received by farmers in corn surplus states of Iowa, Illinois, Indiana, Nebraska, Minnesota, Ohio, and Missouri, were obtained from *Agricultural Statistics*.

Wholesale selling prices for No. 2 yellow corn in the Guntersville-Decatur area were obtained from reports of the Federal-State Market News Service, Birmingham, Alabama. These prices were f.o.b. elevators at Guntersville-Decatur. Wholesale prices for Birmingham represented bulk carlot quotations. Prices used to represent the above areas were as of Thursday nearest the 15th of each month.

For the major corn markets—Kansas City, Omaha, Chicago, St. Louis and Minneapolis—No. 2 yellow corn prices were obtained from reports issued by the Agricultural Marketing Service, U.S. Department of Agriculture, Washington, D.C. Prices for 1960

were those quoted on the 15th of each month except when the 15th was a holiday, a Saturday or a Sunday. When this occurred, the quotation for the day nearest or the day preceding the 15th was used. For 1961 and 1962, prices were those quoted on Thursday nearest the 15th of each month.

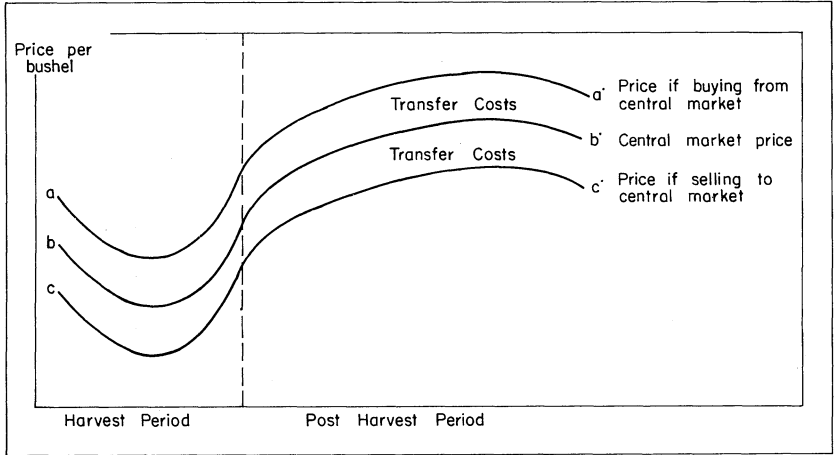
### Price Relationships

Corn is among the major commodities for which production and use are greatly influenced by price changes. Both the general level of and fluctuations in prices have important effects. Corn can be grown over wide geographical areas, is sold on a national market, and has many different and important uses. Among the factors influencing corn prices are levels of production, volumes used and stored, seasons of the year, and marketing practices. On the basis of some of these factors, market areas for corn can be delineated. The nature of the balance that exists between production and utilization of corn in a specified area affects prices. Surplus areas and deficit areas are general terms used in describing the balance between production and utilization of corn in an area.

Prices of a product at selected markets, at a given time and with traders free to trade, may be expected to differ only by an amount equal to inter-market transfer costs. Post-harvest prices at a given market may be expected to equal harvest period prices plus storage costs. Differences in prices resulting from form and grade are reflected by payment and receipt of premiums and discounts based on a standard grade.

For a commodity that is traded under a system similar to that used with corn, prices in local market areas follow directional changes in the general level of prices at central markets. Minor fluctuations in prices will occur independently at local markets from local supply and demand conditions and from quality and quantity of specific lots.

It should be possible to establish theoretical price limits at a local market for a specific grade of corn through the use of storage and transfer costs. A model for estimating expected price limits over the period of a season for a simplified two-market situation is presented in Figure 3. This model could be applicable to any two markets where trading takes place. Assumptions would be that buyers in the deficit area bought corn, that sellers in the surplus area sold corn, and that the corn moved through the central



**FIG. 3.** This chart is a spatial and seasonal price model of corn for relating prices in a local market with those of a central market.

market. The price in the deficit area would be represented by line  $aa'$ , the price at the central market would be represented by line  $bb'$  and the price in the surplus area would be represented by line  $cc'$ . However, if the assumption that the corn moved through the central market was removed, the deficit area price would be expected to fall within the range of  $aa'$  to  $bb'$ . Furthermore, when the prices occur outside of the delineated area, market imperfections exist.

Curvature of the lines indicate that there was seasonal variation in prices. The magnitude and rate of increases and decreases in prices varied from season to season and from year to year. The average seasonal price pattern was similar to the one illustrated.

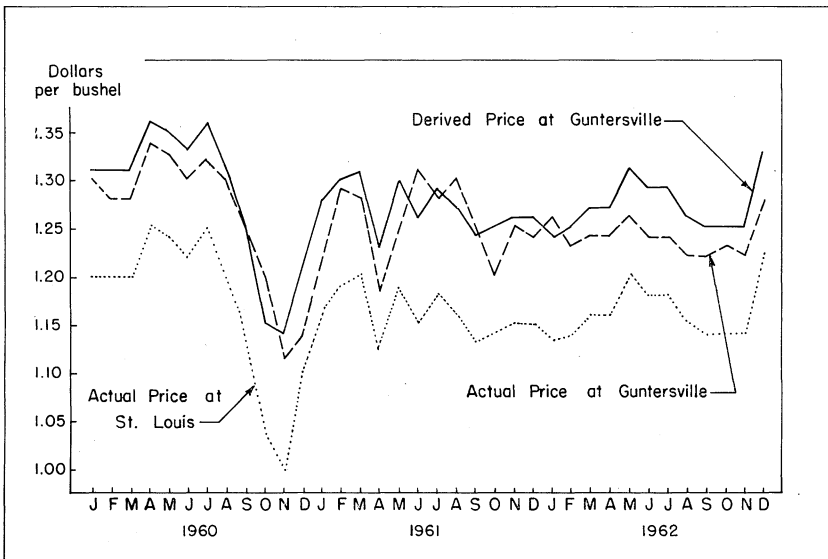
The price of corn in the deficit area should not be greater than the central market price plus transfer charges to the deficit area. At the same time, the deficit area price should not be lower than the central market price. However, the corn market is imperfect and prices will sometimes occur outside the limits set forth in the model. When these imperfections exist, the time necessary to bring the market back to equilibrium will be the same as the time necessary to move corn over the transfer distance with consideration given to transportation rates and price interaction.

The perfect market concept of a base price after adjustments have been made for grade, form, time, and space provides a ref-

erence for determining prices to be used as a benchmark for observed price relationships. To imply that the existing market operates as a perfect one would be erroneous. This concept only gives a basis for understanding the actual market.

**Comparison of Model Prices and Actual Prices**

Actual prices at Guntersville, Alabama, were compared with estimated prices derived by combining St. Louis prices with transfer costs to Guntersville to test the hypothesis advanced under the perfect market concept, Figure 4. In 5 of the 36 months considered, the estimated price was less than the Guntersville price, indicating that corn could have been purchased cheaper from St. Louis than from sources used. During the remaining 31 months, the price estimated for Guntersville, based on St. Louis prices, was greater than the actual price at Guntersville. Furthermore, when the actual price at Guntersville was lower than the estimated procurement price, St. Louis was not the market from which corn could have been procured at lowest cost. Corn received at Guntersville was from markets with lower net procurement costs than those from St. Louis.



**FIG. 4.** A relationship between derived price, based on St. Louis price, and actual price for corn by months, Guntersville, 1960-62 is in the above chart.

Prices and respective transfer costs of markets able to deliver corn to Guntersville had to be considered simultaneously in obtaining the lowest procurement price for corn delivered to Guntersville. The same relationship existed between other supply and consuming markets. Time and communication considerations were primary limiting factors in considering all markets simultaneously. Also, the dynamic nature of corn markets placed another restriction on operation of a perfect market.

Prices considered in this model were those reported for the Guntersville-Decatur area and Birmingham as receiving points. Kansas City, Omaha, Chicago, St. Louis, and Minneapolis were shipping points. Price data for shipping points—particularly for Cairo, Davenport, Peoria, Louisville, Des Moines, and Cincinnati would have been helpful. Also, price series for receiving points in Alabama, such as Brundidge, Montgomery, Selma, Andalusia, and Sheffield, would have increased the effectiveness of these analyses.

### **Prices Received by Farmers**

Mid-month prices received for corn by farmers in Alabama varied among Crop Reporting Districts, Figure 5. However, monthly price variation within each district was greater than monthly price variation among districts. In general, areas with least production experienced highest prices. Districts 4 and 6 had the highest prices, while areas in the Tennessee Valley had the lowest prices.

When Alabama was delineated into three general areas, northern Alabama, central Alabama, and southern Alabama, the highest 3-year average price received for corn by farmers was in central Alabama while northern Alabama registered the lowest price. The difference amounted to 8 cents between central and northern Alabama and 4 cents between central and southern Alabama.

Comparative data for prices received by farmers in the Corn Belt indicated that farmers in Minnesota received the lowest price for corn. The price in Nebraska was next lowest, followed by Iowa, Indiana, Illinois, Ohio, and Missouri, Table 9. For a 3-year average, Alabama farmers received at least 16 cents per bushel more than did farmers in the Corn Belt States. There was 32 cents per bushel difference in the price received by farmers for corn in Minnesota and that received by farmers in Alabama. Moreover, seasonal variation in prices received by farmers was approximately the same for the Corn Belt and Alabama. Prices at peak



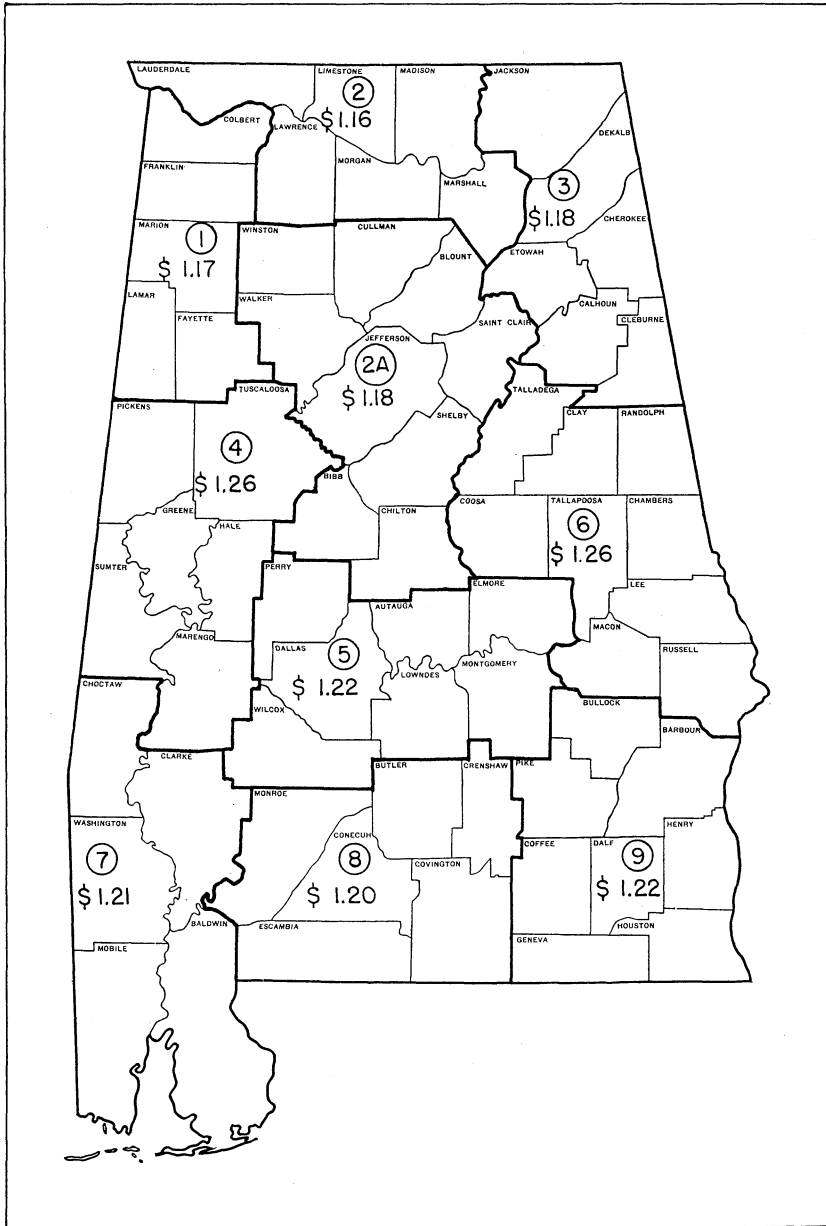


FIG. 5. This map shows the price per bushel received by farmers, for corn, by Crop Reporting Districts, 3- year average, Alabama, 1960-62.

TABLE 9. AVERAGE MID-MONTH PRICES RECEIVED FOR CORN BY FARMERS IN SELECTED STATES, 1960-62

Area	Price per bushel			
	1960	1961	1962	Av. 1960-62
	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>
Ohio.....	1.02	1.01	1.01	1.01
Indiana.....	1.02	.99	.97	.99
Illinois.....	1.03	1.01	.98	1.01
Missouri.....	1.03	1.04	1.05	1.04
Minnesota.....	.87	.87	.90	.88
Iowa.....	.92	.95	.94	.94
Nebraska.....	.96	.96	.99	.97
Alabama.....	1.19	1.19	1.21	1.20
United States.....	1.01	1.00	1.00	1.00

Source: Statistical Reporting Service, *Agricultural Prices*, 1960, 1961, and 1962 annual summaries.

harvest, however, were more markedly lower in the Corn Belt than in Alabama.

Prices received by farmers in the major corn producing states for 1960-62 averaged 10 to 17 cents per bushel less than prices quoted for No. 2 yellow corn, f.o.b. track, at the central market in respective states. For the same time period, prices quoted for Guntersville-Decatur and Birmingham were 8 and 15 cents respectively greater than prices received by farmers in northern Alabama. These differences between prices represented assembling, shelling, drying and grading costs.

### Prices at Central Markets

Price ranges within a market on the same day indicated, to some degree, the competitiveness that existed and the rapidity of price discovery within that market. Where strong competitive forces and good communication existed in a market, prices usually fluctuated through ranges more narrow than those in markets that did not have adequate competition and communications. Corn prices at Chicago usually varied 1 cent or less per bushel within a day. At Minneapolis, Omaha, and Birmingham, price ranges averaged 2 to 4 cents per bushel within a day. Price ranges on any given day were from 0 to 8 cents per bushel. Markets at St. Louis and Kansas City registered wider price ranges than other markets. Price ranges at these two markets averaged approximately 8 cents per bushel.

## PROCUREMENT of CORN

Procurement in this report means performance of major functions pertinent to the transfer of corn from producers to users. These functions consist of buying and selling (including title transfer), financing, grading, handling, storing, and transporting of corn.

### Availability of Corn

Imported corn was available throughout the year in adequate quantities while locally produced corn was available primarily in September through December and in limited quantities. Locally produced corn was available as ear or shelled corn during the harvest season. Eighty-five per cent of the corn sold by local producers was sold as ear corn. Imported corn was usually available only as shelled corn. Supplies of imported corn were offered through established, organized markets during the entire year and locally produced corn was offered for sale at random points and times.

### Procedure

Efficiency of procurement practices was determined by comparing actual procurement costs with estimated costs for alternative methods and sources. To study procurement efficiency in Alabama, data were developed for 1960, 1961, and 1962. The procurement cost of corn was determined when delivery from major markets in the Midwest—Chicago, Minneapolis, Kansas City, Omaha, and St. Louis—was made to various points in Alabama by the lowest cost transportation method.

Monthly price quotations for corn at major markets were used in this procurement analysis. To these prices, transfer costs were added to obtain procurement prices. Transfer costs were composed of transportation charges and related handling and merchandising costs incurred between points of origin and points of destination. Handling and merchandising costs were included in transfer costs only when corn moved by barge-truck. In other situations, corn was assumed to have been transported by one method only, thus eliminating a handling and merchandising charge.

### Handling and Merchandising Charges

Charges were made for handling and merchandising when grain was transferred from one transporting vehicle to another. Receiving and delivering operations, transit storage, quality maintenance, and merchandising constituted major costs. These costs totaled near 5 cents per bushel for most firms. The 5 cents per bushel charge approximated the difference between prices paid and prices received by corn handlers. Handling and merchandising charges for grain were lowest when shipment was by barge and highest when shipment was by truck. However, differences were small.

Estimated handling charges were based on those published by the Alabama State Docks Department, Mobile, Alabama, and on data obtained from grain handlers, Table 10.

### Methods for Procurement

Barge was the cheapest method of transportation from all origins to Guntersville and Decatur. For moving corn to Birmingham and Montgomery, a combination of barge and truck (barge-truck) movement was cheapest. Corn was moved from the Midwest to Guntersville by barge and then transported to Birmingham and Montgomery by truck.

Moving corn from Cairo to Brundidge was cheapest by rail. Corn was delivered to Brundidge from other origins at lowest cost by barge-truck. Also, corn was transported by barge-truck to Dothan at lowest cost from all origins except Cairo and Louisville where rail transportation was cheaper. Barge-truck was the method by which corn was most often delivered at lowest cost.

It might be expected that a large proportion of the corn moving to a given destination would be transported by the method with the lowest transportation rate. However, that situation did not exist between all points. Movements by rail were taking place where transit privileges were important in the transfer of grain or grain products to final destinations. Truck movements were preferred at some points because of quick delivery. Also, truck movements occurred where truckers were backhauling grain. Rates on backhauls were often lower than rates charged by competing methods of transportation. Backhaul rates were not uniform, nor were they published.

Application of "Big John" rates would have changed the means of transporting grain between various locations. "Big John" rates

TABLE 10. CHARGES FOR HANDLING BULK GRAIN, ALABAMA, 1959, 1961, AND 1962

Type of carrier	Handling charges			Handling charges		
	Receiving by <sup>1</sup>	Receiving by <sup>2</sup>	Receiving by <sup>3</sup>	Delivering to <sup>1</sup>	Delivering to <sup>2</sup>	Delivering to <sup>3</sup>
	Cost per bushel					
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Cars.....	1.50	1.51	1.50	0.75	0.67	0.75
Barge.....	1.50	.84	---	.75	.88	.75
Standard grain barge.....	---	---	1.50	---	---	---
Double deck barge.....	---	---	3.00	---	---	---
Ocean vessel.....	1.50	---	---	.75	---	.75
Truck.....	2.00	1.26	2.75	.75	.78	.75

<sup>1</sup> Alabama State Docks Department *Public Grain Elevator Tariff No. 1-A* (Mobile, Alabama, July 29, 1959).

<sup>2</sup> Data in this study.

<sup>3</sup> Alabama State Docks Department *Public Grain Elevator Tariff No. 1-B* (Mobile, Alabama, September 15, 1962).

on single carloads would have been lower than rates for other means of transportation from Kansas City to Montgomery, Brundidge, and Dothan; from Omaha to Birmingham, Montgomery, and Dothan; and from St. Louis to Birmingham, Montgomery, Brundidge, and Dothan. The same would have been true for grain moved from Minneapolis to Brundidge and Dothan in January, February, and March. Barge transportation was not available to Minneapolis during these months. In the absence of "Big John" rates, barge-truck transportation via Guntersville was the cheapest method.

### Sources for Procurement

Shipping and receiving points for corn transported into Alabama are geographically illustrated in Figure 6. The cities in Alabama represent receiving points while the other cities represent shipping points.

Estimated procurement prices at selected points in Alabama indicated that Minneapolis was consistently the least-cost source of corn during April through December. Occasional exceptions to this were St. Louis in October and Chicago in November.

During January through March, Kansas City, Omaha, Chicago or St. Louis provided the least-cost source of corn. The basic explanation for this situation was that the upper Mississippi River was frozen and closed to barge traffic. In those months, corn at Minneapolis was moved only by truck or rail. Movements by these methods made procurement prices in Alabama, based on the Minneapolis market, greater than procurement prices based on other markets.

Procurement prices based on the St. Louis market averaged about one and one-third cents per bushel lower than when based on the Chicago market, about two and two-thirds cents lower for the Omaha market, and about three and two-thirds cents lower for the Kansas City market. However, the minimum monthly procurement price shifted from one market to another. The variation of relative differences in prices among the four markets and differences in transportation rates to Alabama permitted the shifting.

Comparison of procurement prices based on Minneapolis and the other four markets indicated that a much larger volume of corn should have been obtained from Minneapolis. Theoretically, heavy purchases from that source would have caused the price in

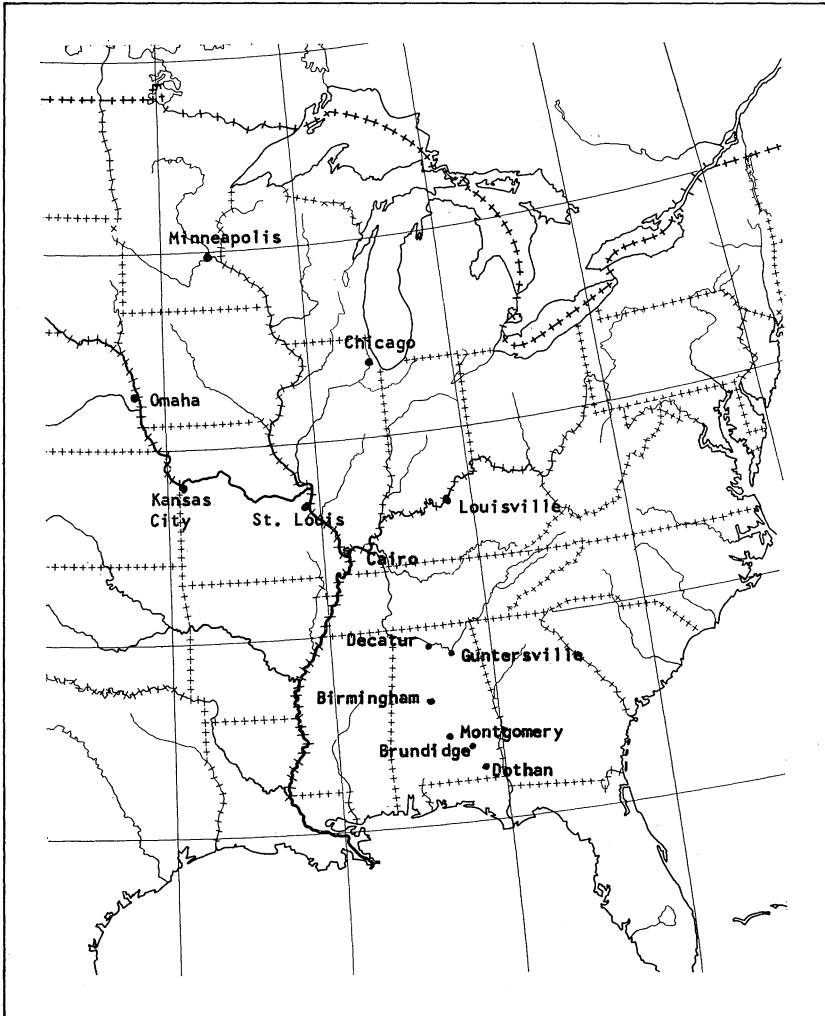


FIG. 6. Shown here are shipping and receiving points for corn transported into Alabama.

Minneapolis to rise. At the same time, less corn would have been purchased from other markets; thereby, exerting a depressing effect on prices in these markets. As a result of shifting purchases, a new equilibrium price should have been established. Apparently a new equilibrium price was not established. Therefore, it is assumed that grain handlers were not purchasing corn from the least-cost source.

The source of corn would have shifted for all procurement points except Guntersville and Decatur assuming that "Big John" rates had been in effect in 1962. The source for Birmingham, Montgomery, Brundidge, and Dothan would have been St. Louis for the entire year. This change in source brought about by using "Big John" single carload rates would have reduced procurement costs of corn for these cities in Alabama 4, 5, 8, and 8 cents per bushel, respectively. Shipments in multiple carloads rather than single carloads would have further lowered the procurement costs of corn 1 to 3 cents per bushel for these procurement points in Alabama.

St. Louis would have been the lowest cost source for Birmingham, Montgomery, Brundidge, and Dothan if "Big Johns" had been used to transport corn. In January, February, and March, procurement prices for these points in Alabama using "Big John" rates and Omaha as a source would have been lower than the lowest procurement prices if "Big Johns" had not been used. Also, this would have been true for Minneapolis as a source of corn for Brundidge and Dothan. There were a few other months for different sources and destinations when "Big Johns" would have facilitated lower procurement costs.

### Seasonal Variation in Price

Seasonal variation in corn prices influenced procurement practices of grain users. Prices received by farmers, and prices f.o.b. track at Birmingham and f.o.b. elevator at Guntersville were consistently lowest in October and November. No consistency in highest prices was exhibited during the crop year for the three markets. Prices received by farmers in Alabama were 8 cents per bushel lower than the f.o.b. elevator price at Guntersville and 15 cents per bushel lower than the f.o.b. track price at Birmingham.

In the crop year 1960-61, farmers in northern Alabama reported receiving \$1.08 per bushel in the September-December period, \$1.18 in January-April, and \$1.23 in May-August. Farmers in the same sample reported paying \$1.18, \$1.26, and \$1.26 for corn during corresponding periods. The differences in the received and paid prices by farmers were 10 cents, 8 cents, and 3 cents, respectively.

Farmers paid a lower price for corn bought from other farmers than for corn bought from other sources. Only ear corn was bought from other farmers. The highest price farmers paid was



for shelled corn when it was bought from feed manufacturers. The lowest price for shelled corn was paid to grain dealers.

Furthermore, corn purchased by farmers from other farmers required a minimum of handling and merchandising. Corn purchased from importers of grain was hauled greater distances to the grain feeder than locally produced corn.

#### **Advantages and Disadvantages of Purchasing Locally Produced Corn for Farm Use**

There were three major advantages of purchasing locally produced corn. During the year when locally produced corn was available it was usually bought for less than imported corn. In most cases, local corn was of good quality. The other advantage was that ear corn could have been purchased.

The most critical disadvantage of purchasing locally produced corn was that the corn was available only during harvest season, which necessitated concentration of purchases during that period. Further, storage facilities would had to be available or made available for use along with equipment and labor to handle unscheduled arrival of corn. In operations where ground feed was fed, processing facilities were necessary to overcome the costly problem of transporting corn to and from a processor.

#### **Advantages and Disadvantages of Purchasing Imported Corn for Farm Use**

The most outstanding advantage of purchasing imported corn was that graded shelled corn was available in adequate quantities throughout the year. Deliveries of corn could have been scheduled during slack farm work periods. Farm trucks could have been used to haul corn to the farm, thus lowering costs for the overall operation.

Among disadvantages of purchasing imported corn was that imported corn could be purchased only as shelled corn. This placed a limitation on operations using ear corn for meat production. Prices of imported corn were usually higher than prices of locally produced corn and the differences in the two prices were greater during the corn harvesting season.

## SUMMARY

Significant changes have taken place during recent years in Alabama's feed-grain and meat-producing industries. Specialization of enterprises and size of operations have increased. Production of livestock and poultry has increased while total production of corn in Alabama has remained about the same during the past decade. Acquisitions of corn and other grains have been necessary to meet needs of the expanding poultry and livestock industries.

The increasing difference between corn production and utilization in Alabama has focused attention on the movement of corn from surplus producing areas into Alabama. Corn has been purchased in relatively large volumes throughout the year by grain handling firms in Alabama. The major portion has been imported from the Corn Belt.

Purchases of imported corn and locally produced corn by firms in Alabama have been greatest during the harvesting season—October through December. Purchases of locally produced corn have been more concentrated during this period than purchases of imported corn.

Approximately 85 per cent of all corn purchased by grain handlers in Alabama in 1959 and 1960 came from sources outside the State. Illinois was the leading source of corn during both years. Iowa, Missouri, and Indiana were also important sources of corn.

Corn was imported into Alabama by barge, truck, and rail. Barges transported approximately 60 per cent in 1959 and 80 per cent in 1960. Major points for barge imports were along the Tennessee River at Gunterville, Decatur, and Sheffield, with Gunterville receiving three-fourths of all barge imports. Imports by trucks direct from the Corn Belt went primarily into southern Alabama with a lesser amount going into central Alabama. Railroads were used to transport corn to Birmingham, Montgomery, Tuscaloosa, and other points where transit privileges were important.

Barge, truck, and rail transportation has been available to a limited number of firms. Receipt and shipment of corn by barge have been limited to firms located on the Tennessee River and Mobile Bay. All firms have been equipped to handle truck receipts and shipments, and at the same time truck transportation

has been available to them. Railroad transportation has been available to 41 per cent of the firms.

Barge rates have been the lowest for moving corn between points where navigable waterways were available. In some cases where barge transportation was not available, barge-truck transportation was cheaper than other means because the barge portion of the rate was lower than other methods. Truck transportation has been particularly effective for short distances and when backhauls of corn were made. Transit privileges granted by railroads have had a strong influence on the means of transportation selected for shipments of corn stored or processed enroute.

An analysis of prices in corn-deficit and corn-surplus areas indicated that deficit area prices have not been greater than the sum of surplus area prices and transfer charges.

For 1960-62, prices received by farmers in the major corn producing states averaged 10 to 17 cents per bushel less than prices quoted for No. 2 yellow corn, f.o.b. track, at the central market in respective states. Prices quoted for Guntersville-Decatur area and for Birmingham were 8 and 15 cents greater, respectively, than prices received by farmers in northern Alabama.

Seasonal variation in prices received by farmers was approximately the same for major corn producing states and Alabama. Prices at peak harvest, however, were more depressed in the Corn Belt than in Alabama.

Imported corn was available as shelled corn throughout the year in adequate quantities; whereas, locally produced corn was available primarily as ear corn during harvest season. Imported corn was for sale through established, organized markets and locally produced corn was for sale at random points.

Estimated procurement prices at selected points in Alabama indicated that Minneapolis was consistently the least-cost source of corn during April through December. Kansas City, Omaha, Chicago or St. Louis provided the least-cost source of corn during January, February, and March. Assuming that "Big John" rates had been in effect in 1962, the source of corn would have shifted for all procurement points except Guntersville and Decatur. The source for Birmingham, Montgomery, Brundidge, and Dothan would have been St. Louis for the entire year.

The major advantage of purchasing locally produced corn was that good quality ear corn could have been bought during the harvest period for less than imported shelled corn. The most

critical disadvantage of purchasing locally produced corn was that such corn was available only during harvest season.

An outstanding advantage of purchasing imported corn was that graded, shelled corn was available in adequate quantities throughout the year. Among the disadvantages of purchasing imported corn was that it was available only as shelled corn. Furthermore, the price of imported corn was usually more than the price of locally produced corn.

Alabama is expected to continue to be a corn-deficit area. Corn will be imported in increasing amounts from surplus producing areas in the Midwest.

In situations where ear corn is desired and adequate storage facilities are available, users of locally produced corn can profit by making purchases during the harvest season.

Sources of corn procurement for Alabama will change if "Big John" rail rates as originally proposed by Southern Railway System are permitted by ICC. Application of "Big John" freight rates will lower procurement cost of corn for grain users in Alabama. Transportation at "Big John" rates will be most beneficial to grain users who do not need transit privileges.

## APPENDIX

APPENDIX TABLE I. EFFECTIVE RATES FOR CORN TRANSPORTED IN BULK CARLOADS, AS OF JANUARY 1, 1960

From	Cost per bushel to:					
	Guntersville	Decatur	Birmingham	Montgomery	Brundidge	Dothan
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Cairo <sup>1</sup> .....	20.16	14.71	17.92	21.84	24.08	26.32
Chicago <sup>1</sup> .....	36.96	32.48	36.96	40.88	42.56	44.24
Kansas City <sup>2</sup> .....	33.88	28.84	31.08	35.56	37.24	40.04
Louisville <sup>3</sup> .....	20.72	16.80	20.72	24.64	26.32	28.00
Minneapolis <sup>2</sup> .....	45.64	41.16	43.96	47.88	50.12	52.36
Omaha <sup>2</sup> .....	39.48	35.00	37.80	41.72	43.96	46.20
Peoria <sup>1</sup> .....	37.80	33.32	36.12	40.04	42.28	44.52
St. Louis <sup>1</sup> .....	25.20	21.28	24.08	26.88	28.56	30.24

<sup>1</sup> Local rate to Ohio or Mississippi River crossing.

<sup>2</sup> Proportional rate to Ohio or Mississippi River crossing.

<sup>3</sup> Local rate.

Source: Navigation Economics Branch, Tennessee Valley Authority, Knoxville, Tennessee.

APPENDIX TABLE 2. RAIL RATES FOR CORN, IN BULK SINGLE CARLOADS VIA "BIG JOHN" HOPPER CARS AND SOUTHERN RAILWAY SYSTEM, OCTOBER, 1963<sup>1</sup>

From	Cost per bushel to:					
	Guntersville	Decatur	Birmingham	Montgomery	Brundidge	Dothan
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Cairo.....	8.596 <sup>2</sup>	8.064 <sup>2</sup>	<u>8.064<sup>2</sup></u>	<u>9.604<sup>2</sup></u>	<u>10.584<sup>2</sup></u>	<u>11.900<sup>2</sup></u>
Chicago.....	26.068 <sup>3</sup>	25.704 <sup>4</sup>	<u>26.600<sup>4</sup></u>	<u>30.240<sup>4</sup></u>	<u>28.868<sup>3</sup></u>	<u>31.584<sup>4</sup></u>
Kansas City.....	25.648 <sup>3</sup>	23.576 <sup>5</sup>	<u>24.752<sup>5</sup></u>	<u>28.420<sup>5</sup></u>	<u>27.664<sup>3</sup></u>	<u>29.932<sup>5</sup></u>
Louisville.....	9.016 <sup>2</sup>	8.064 <sup>2</sup>	<u>8.960<sup>2</sup></u>	<u>12.600<sup>2</sup></u>	<u>11.816<sup>2</sup></u>	<u>13.944<sup>2</sup></u>
Minneapolis.....	34.048 <sup>3</sup>	31.976 <sup>5</sup>	<u>33.152<sup>5</sup></u>	<u>36.820<sup>5</sup></u>	<u>36.064<sup>3</sup></u>	<u>38.332<sup>5</sup></u>
Omaha.....	27.888 <sup>3</sup>	25.816 <sup>5</sup>	<u>26.992<sup>5</sup></u>	<u>30.660<sup>5</sup></u>	<u>29.904<sup>3</sup></u>	<u>32.172<sup>5</sup></u>
Peoria.....	26.208 <sup>3</sup>	24.136 <sup>4</sup>	<u>25.312<sup>4</sup></u>	<u>28.980<sup>4</sup></u>	<u>28.224<sup>3</sup></u>	<u>30.492<sup>4</sup></u>
St. Louis.....	11.368 <sup>2</sup>	9.296 <sup>2</sup>	<u>10.472<sup>2</sup></u>	<u>14.140<sup>2</sup></u>	<u>13.384<sup>2</sup></u>	<u>15.652<sup>2</sup></u>

<sup>1</sup> The underlined rates represent rates lower than those by any other means for the corresponding origins and destination.

<sup>2</sup> It is assumed that the grain would be moved by truck into indicated origins and that either "non-transit" box car rates or "Big John" hopper car rates, as applicable, would be the lowest charges.

<sup>3</sup> It is assumed (a) that grain moved by rail box car from origin to destination; (b) that it had a prior rail movement into the indicated origin; (c) that it moved under full transit rates up to the river crossings; and (d) that it moved on non-transit box car rates beyond the river crossings.

<sup>4</sup> It is assumed (a) that the grain moved by truck into indicated origins and that flat rates would apply from indicated origins to applicable river crossings; and (b) that the grain comes to rest at the river crossings and is available for movement in "Big John" cars beyond the crossings.

<sup>5</sup> It is assumed (a) that grain moved by rail into the indicated origins and that, as applicable, intermarket proportional rates can be used; and (b) that the grain comes to rest at the river crossings and is available for movement in "Big John" cars beyond the crossings.

Source: Special letter from Southern Railway Senior Transportation Economists, October 9, 1963.

APPENDIX TABLE 3. RAIL RATES FOR CORN, IN BULK MULTIPLE CARLOADS VIA "BIG JOHN" HOPPER CARS AND SOUTHERN RAILWAY SYSTEM, OCTOBER, 1963<sup>1</sup>

From	Cost per bushel to:					
	Guntersville	Decatur	Birmingham	Montgomery	Brundidge	Dothan
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Cairo.....	7.504 <sup>2</sup>	6.720 <sup>2</sup>	<u>7.476<sup>2</sup></u>	<u>9.016<sup>2</sup></u>	<sup>3</sup>	<u>10.948<sup>2</sup></u>
Chicago.....	25.144 <sup>4</sup>	24.360 <sup>5</sup>	<u>25.116<sup>5</sup></u>	<u>28.140<sup>5</sup></u>	<sup>3</sup>	<u>29.260<sup>5</sup></u>
Kansas City.....	23.744 <sup>4</sup>	22.036 <sup>6</sup>	<u>23.016<sup>6</sup></u>	<u>26.068<sup>6</sup></u>	<sup>3</sup>	<u>27.328<sup>6</sup></u>
Louisville.....	7.504 <sup>2</sup>	6.720 <sup>2</sup>	<u>7.476<sup>2</sup></u>	<u>10.500<sup>2</sup></u>	<sup>3</sup>	<u>11.620<sup>2</sup></u>
Minneapolis.....	32.144 <sup>4</sup>	29.036 <sup>6</sup>	<u>31.416<sup>6</sup></u>	<u>34.468<sup>6</sup></u>	<sup>3</sup>	<u>35.728<sup>6</sup></u>
Omaha.....	25.984 <sup>4</sup>	24.276 <sup>6</sup>	<u>25.256<sup>6</sup></u>	<u>28.308<sup>6</sup></u>	<sup>3</sup>	<u>29.568<sup>6</sup></u>
Peoria.....	24.304 <sup>4</sup>	21.196 <sup>5</sup>	<u>23.576<sup>5</sup></u>	<u>26.628<sup>5</sup></u>	<sup>3</sup>	<u>27.888<sup>5</sup></u>
St. Louis.....	9.464 <sup>2</sup>	6.356 <sup>2</sup>	<u>8.736<sup>2</sup></u>	<u>11.788<sup>2</sup></u>	<sup>3</sup>	<u>13.048<sup>2</sup></u>

<sup>1</sup> The underlined rates represent rates lower than those by any other means for the corresponding origins and destinations.

<sup>2</sup> It is assumed that the grain would be moved by truck into indicated origins and that either "non-transit" box car rates or "Big John" hopper car rates, as applicable would be the lowest charges.

<sup>3</sup> Non published.

<sup>4</sup> It is assumed (a) that grain moved by rail box car from origin to destination; (b) that it had a prior rail movement into the indicated origin; (c) that it moved under full transit rates up to the river crossings; and (d) that it moved on non-transit box car rates beyond the river crossings.

<sup>5</sup> It is assumed (a) that the grain moved by truck into indicated origins and that flat rates would apply from indicated origins to applicable river crossings; and (b) that the grain comes to rest at the river crossings and is available for movement in "Big John" cars beyond the crossings.

<sup>6</sup> It is assumed (a) that grain moved by rail into the indicated origins and that, as applicable, inter-market proportional rates can be used; and (b) that the grain comes to rest at the river crossings and is available for movement in "Big John" cars beyond the crossings.

Source: Special letter from Southern Railway Senior Transportation Economics, October 9, 1963.

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