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Grain Storage and Marketing Facilities in Mississippi

MISSISSIPPI STATE COLLEGE
AGRICULTURAL EXPERIMENT STATION
CLAY LYLE, Director

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Grain Storage and Marketing Facilities In Mississippi

By

TRAVIS D. PHILLIPS

INTRODUCTION

Farmers of Mississippi have been undergoing a far-reaching agricultural adjustment characterized by dynamic and better-balanced systems of farming. The more important reasons for these changes have been price support and acreage control programs for certain crops, improved markets, technological developments, changing price levels, and a fuller realization of the advantages associated with balanced-farming programs.

Shifts in Sources of Cash Farm Income

A good indication of the nature and significance of the changes which have occurred has been the shift in the relative importance of different farm enterprises as sources of cash farm income (Appendix Table 1). Distinct trends disclose changes of a permanent nature which are leading to a better balance among the agricultural enterprises. Associated with these trends, however, have been highly irregular fluctuations which bear evidence of the impact of such forces as major technological innovations, changing price levels, and government programs.

The most significant of the trends, since World War I, has been the marked increase in the relative importance of livestock and livestock products as sources of cash farm income. This increase has been offset in part by the decline in the relative importance of cotton and cottonseed. Less significant, but of great importance from the standpoint of increased total income, have been the slight relative increases in the grain crops, including soybeans.

The relative changes need to be appraised in terms of changes that have occurred in absolute income. For example, during the years 1924-28 cotton and cottonseed accounted for 77 per-

cent of the total farm income while having an annual average cash value of only \$166 million. In contrast, these two products, in 1949-53, accounted for only 64 percent of the total farm income while having a much higher annual average cash value of \$350 million. The extent of absolute changes in income and of irregular fluctuations is shown in Appendix Table 2.

A study of grain marketing necessarily leads to a closer examination of changes in both the relative and absolute importance of these crops. The reasons for these changes should also be noted in order to understand the significance of the trends toward grain production.

In 1942, the soybean crop in Mississippi, which had never before returned an annual income as great as three-fourth million dollars, exceeded \$3 million in value. The primary causes of this tremendous increase were, first, farmers were faced with acute labor shortages and turned to soybeans as a high-value, low-labor requirement, alternative enterprise; and, second, the government support price of soybeans was relatively favorable. Since 1942, the income from soybeans has never dropped below \$1.5 million. However, annual income from this source has fluctuated widely as a result of cotton acreage control programs, recurrent labor shortages, highly variable per-acre yields, and varying soybean prices.

This expansion in soybean production was dependent upon the availability of marketing and processing facilities. The facilities used for processing cottonseed have been readily adaptable to soybean crushing, and, in the face of declining cottonseed production, cottonseed crushers have been eager to get the soybeans.

The total for other grain crops (corn, oats, wheat, barley, rice) equaled soybeans as a source of cash farm income during the period 1949-53. The increase in importance of these other grains has been less spectacular than for soybeans. In the decade just following World War I, farmers in Mississippi produced little more than enough grain for home consumption requirements. As tractors replaced workstock, grain production was maintained at about the same levels, and more grain was moved through commercial channels.

In more recent years production of grain has been increased, primarily as a result of changing livestock management practices. Large acreages of small grains have been planted for winter grazing. Proper management of these winter grazing crops has made it possible for the farmer to harvest grain which can either be sold or fed to live-stock. Paralleling this increase in small grain production has been an expanding requirement for grain as feed for the rapidly growing poultry and dairy enterprises.

The Grain Storage Situation

Commercial production of corn, oats, wheat, barley, and rice expanded less rapidly than soybeans because facilities for handling these grains were limited. Miley described conditions as late as 1943 as:

In recent years three small grain elevators have been operating in the Delta, two at Greenville and the other at Inverness. The operators of these elevators buy grain outright or store in on a fee basis for the producers. The operators of these elevators have not found the demand for their services sufficient to expand their operations materially. The outlets for the oats they buy are rather limited, since they have not been able to compete successfully in the out-of-state markets in the South with the oats shipped in from other areas.¹

The situation described by Miley partially explains the slow growth of

commercial grain production. Business firms hesitated to invest in expensive facilities because of the uncertain demand for these facilities. Farmers, on the other hand, preferred to allocate their productive resources to farm enterprises for which market outlets were readily available.

Since 1943, facilities for marketing grain have been increased. Severely depressed prices at harvest time indicate that construction of facilities has lagged behind production increases. In years when soybean prices have been at, or near, the support level, the confusion resulting from inadequate facilities has been more evident. Farmers tend to use storage facilities for soybeans and dump their other grains on the market. The grains become, in effect, distress merchandise and sell at prices well below support levels.

Purpose and Method of Study

This study was initiated to obtain information for Mississippi on the adequacy, practices, services, and charges for the storage of commercial crops, other than cotton lint. The present study makes available information needed for a better understanding of production and utilization trends and seasonal price fluctuations. A description of the over-all situation is necessary in order that farmers may examine the alternatives in grain production and in marketing their surpluses, and that business firms interested in investments in the marketing process can help to adjust facilities to production.

An inventory of present storage facilities, both commercially and on-the-farm, was necessary. This information was obtained by personal interviews. All of the operators and/or owners of commercial elevators were interviewed to obtain data on capacities, charges, services, and practices in the normal operation of the facilities. Estimates of the capacity of on-the-farm storage facilities and production trends were obtained by a complete survey of the county extension and Agricultural Stabilization and Conservation per-

¹ Miley, D. Grav, *Commercial Agricultural Production and Marketing Methods and Facilities in Mississippi*, Mississippi Agricultural Experiment Station Bulletin 394, October, 1943, pp. 87-88.

sonnel in each county. As a check against the capacity of storage facilities, supplementary material was obtained from the State ASC office.

Production trends of the grain crops were developed from data available in reports of the Mississippi Crop and Livestock Reporting Service, from other secondary materials, and, as mentioned above, from estimates by county extension agents.

A section of this report was developed to indicate present and potential uses of Mississippi feed grains. Interviews with feed mill operators were made to determine the volume of grain moving through the feed mills the previous year and to study the grain movement between Mississippi and other areas. However, because of the short time some of the mills have been in operation and due to the seasonality of the feed mill business, records were

often inadequate. Therefore, the major part of the section on utilization was developed from secondary material.

The information on seasonal prices and storage costs was assembled largely from secondary sources. Storage costs have been limited to the charges by commercial elevators and to the cost of permanent structures on the farm.

The findings resulting from the survey of the capacity of facilities are presented in the section on storage facilities. Storage capacities were contrasted with the volume of grain placed in the Commodity Credit Corporation loan during 1954 to give some measure of the adequacy as far as capacity was concerned. Conclusions derived from the various segments of the study have been summarized in the final section.

GRAIN PRODUCTION

The combined acreages of the grain crops (corn, oats, wheat, barley, rice, soybeans) in Mississippi have usually been about equal to the acreage of

cotton. Figure 1 shows that the long-time trend in corn acreage has been downward, while in Figures 2, 3, 4, and 5, the trends for the other grain

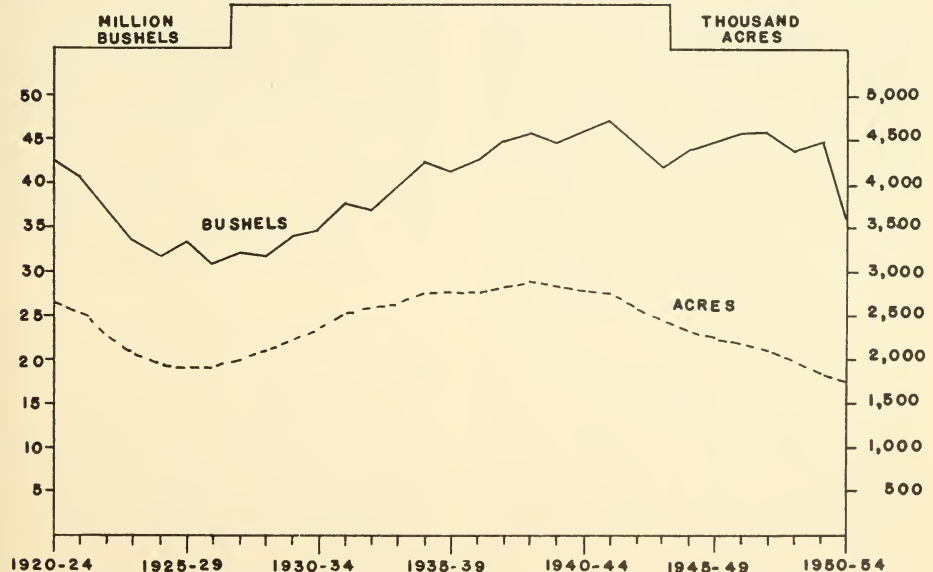


Figure 1. Five-year moving averages of corn acreage and production in Mississippi, 1920-54. Source: See original data in Appendix Table 3.

crops have been definitely upward. The figures on other grains mentioned above, except for rice, do not reflect the full significance of the 1953-54 acreage trends, which have increased much faster than the five-year averages indicated.

With the possible exception of corn, there has been a definite increase in the production of each of the grain crops. The declining acreage of corn has been offset in part by increased yield per acre, so that total production has tended to remain fairly constant.

In this section of the report, past production, factors affecting changes in production, and probable future production have been analyzed for each crop.

Corn

Mississippi has never been a very important commercial corn-producing state. Corn has always been produced primarily for home consumption.² Figure 1 indicates that a fairly constant amount of corn has been required over the past 35 years. As the acreage of corn has decreased, yields have increased to maintain a relatively constant total production.

Even though corn-consuming livestock enterprises have just about doubled in the last 30 years (Appendix Table 1), the total production of corn has not changed materially. This was probably made possible by the sharp decline in workstock as farmers shifted to modern machinery as a source of farm power, and by the transition in the meat animals from large animals carrying a great deal of waste fat to smaller, more compact animals. Also these smaller meat animals have required less feed for body maintenance.

Technology within the last 35 years has increased corn yields in Mississippi about 35 to 40 percent. However, the state's average corn yield per acre still lags behind the United States average by about the same relative amount. Corn production has been dependent greatly upon climatic conditions, rain-

fall in particular. Drought has reduced drastically the yield through the period 1951-54. Technological advances, such as the introduction of hybrids, fertilization, and new cultural methods, have been instrumental in achieving these increases and are capable of pushing yields much higher in the future.

Corn yield in the future will depend upon how far this technology is pushed. The corn acreage probably will depend upon governmental action to control basic commodity prices. However, insofar as such restrictions are imposed, the production of corn should at least hold its present level, or probably show some increase.

Certain livestock enterprises may exert pressure on corn production in the future in Mississippi. There seems to be a growing interest in the possibilities of feeding out beef calves on the farms in the South instead of shipping them to the Corn Belt. Broiler production has caused more consideration to be given to home-produced corn. A survey in Scott County, a heavy broiler-producing area, indicated that approximately a million bushels of shelled corn were brought into the county from sources outside of Mississippi during 1953.³ Lack of processing equipment and storage facilities, together with the fact that enough locally-produced corn was not available, accounted for the heavy in-shipments into Mississippi's greatest broiler-producing county. The development of feed mills which can produce formula feeds at prices below those normally paid should stimulate corn production on livestock-producing farms.

Oats

Oats were formerly planted in the South as feed for workstock. In 1943, Miley stated that:

Oat production was started in the Delta as a means of producing feed for workstock, and are still planted mainly for that purpose; but in recent years there has been a considerable increase in commercial oat production.⁴

² Miley, *Op. Cit.*, p. 87.

³ From a survey made by the Scott County extension personnel in January, 1954, to determine the amount of corn for poultry feed utilized by the feed mills in 1953.

⁴ Miley, *Op. Cit.*, p. 87.

Since Miley's study was made, oat production reached new peaks in 1944 and 1945 followed by a falling off of production in the postwar years. Production during 1953 and 1954 has risen back to the 1944 and 1945 level. Workstock have been disappearing as consumers of oats but are being replaced rapidly by cattle and poultry.

Oat yields have by no means been stable; however, there has been a steady increase. During the past 35 years the yields have about doubled with no indications of leveling off (Appendix Table 4).

The oat crop has been one of the more popular of the small grains planted for winter grazing. Yields have tended to increase, even with grazing, provided the animals were removed at the proper time.

The emphasis on winter grazing, as well as being a solution to the labor shortage, has probably accounted for the popularity of the crop since about 1940. The ease with which the crop can be stored for CCC loans may influence production as long as the support levels are high.

The amount of oats harvested for

grain may be influenced materially by the growing tendency to cut the entire plant in the dough stage for hay. This has been especially true in the upland areas of Mississippi where a great many dairy cattle are found. Cutting the entire plant has eliminated the necessity for combines and facilitated storage as well as provided roughage along with the grain for the cattle. Feed mills which grind this baled oat hay and add the desired concentrates have been responsible to a large extent for this change in the method of harvest.

Indications are that oat production will continue at a high level as long as no restrictions are placed on the acreage. The level of support prices will also be a determinant factor. Lack of storage facilities which meet the CCC standards for loans may influence the amount of production, if market prices fall far below support prices.

Usually oats and corn are fed together—the amount of each depending upon the relative price of the two crops. Therefore, oats would also be in demand for feeder calves in the event a feeding program were initiated in Mississippi.

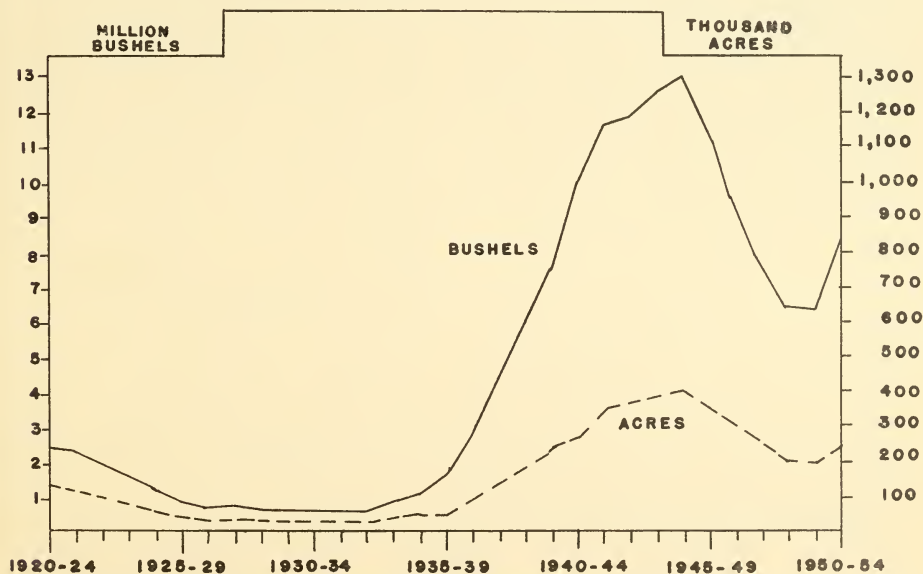


Figure 2. Five-year moving averages of oat acreage and production in Mississippi, 1920-54. Source: See original data in Appendix Table 4.

Soybeans

Soybeans harvested for beans became of importance during World War II. The critical shortage of vegetable oils for war purposes necessitated the imposition of government price supports. A sharp increase in soybean production resulted (Figure 3).

The production of soybeans increased through the war years but dropped back almost to prewar levels after the war. However, beginning with 1948, there has been a rapid increase in the acreage planted in soybeans, with the exception of 1953.

The low level of yields in some years has been a major setback to the crop, Table 1. Since Mississippi has produced such a small part of the total crop in the United States, local fluctuations in production probably have had little influence on prices. Also, cottonseed, a close substitute for soybeans, have been accumulated by the CCC and have tended to act as a price ceiling over soybeans. For these reasons, soybeans have not always been too dependable as the sole source of farm income.

Technology has advanced the yield of

Table 1. Soybean acreage, yield, and production in Mississippi, 1949-54.

Year	Acres (1,000)	Yield (Bu./A.)	Production (1,000 bu.)
1949	103	16.5	1,782
1950	358	25.0	8,950
1951	425	13.0	5,525
1952	455	13.5	6,142
1953	250	12.0	3,000
1954	519	9.5	4,930
Average	352	14.9	5,055

Source: *Agricultural Statistics*, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1951-53; *Crop Production—1954, Annual Summary*, Agricultural Marketing Service, Crop Reporting Board, United States Department of Agriculture, Washington, D. C.

soybeans on the average but has done little to keep yields consistent from one year to the next. These fluctuations are not revealed in Figure 3 because the five-year moving averages have tended to smooth out the extremes; but statistics for individual years give a better idea of just how uncertain the crop has been in Mississippi, Table 1.

The increase in soybean production in Mississippi beginning in the early war years may be accounted for in several ways. Probably one of the more important reasons was the shortage of

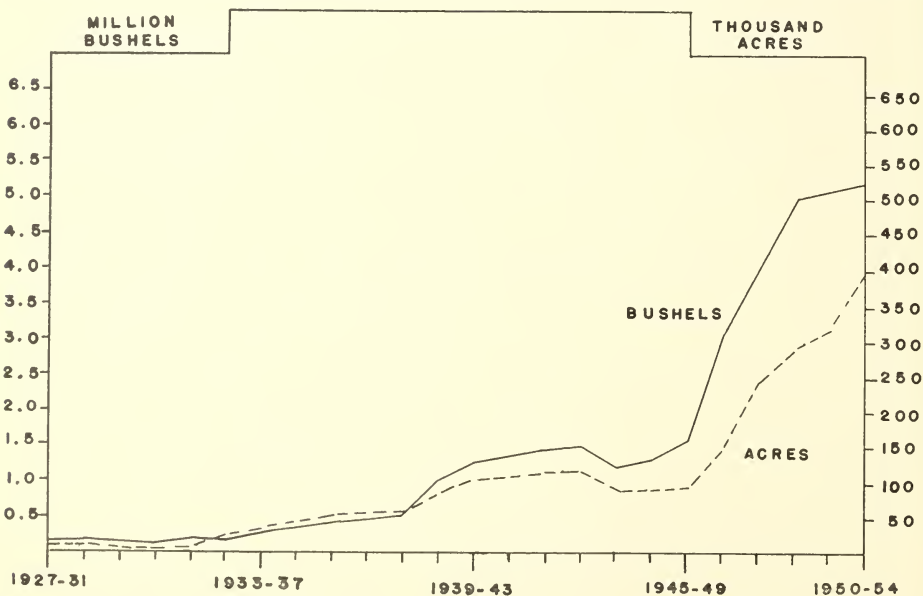


Figure 3. Five-year moving averages of soybean acreage and production in Mississippi, 1927-54. Source: See original data in Appendix Table 5.

vegetable oils which caused the price of soybeans to rise sharply. Labor shortages during the war forced farmers to turn to crops which required less man-hours. Where labor created a problem, soybeans substituted for cotton as a cash crop. Cotton acreage restrictions after the war have had a significant effect on the soybean acreage.

After World War II the soybean acreage in Mississippi declined for two major reasons. First, labor was not as scarce in the postwar years as it had been during the war period. Second, soybean price supports were eliminated when vegetable oils were no longer needed for military purposes. Table 2 gives some indications of how the price of soybeans changed relative to cotton and cottonseed when the supports on soybeans were removed after the war as compared to the support period during the war. After the war with a more abundant labor supply available, farmers were able to turn from lower-priced soybeans to more favorably-priced crops such as cotton.

The trend in the production of soybeans has been sharply upward in recent years following the decreased emphasis on the crop immediately after the war. Perhaps this increased interest can be explained by the method by which cottonseed and soybean prices have been supported. Cottonseed and soybeans have competed with each other from the planting of the seed all the way to oil and meal products. Competition for production has not stopped at the farm level, as both cottonseed and soybeans begin their initial processing through the same facilities—the oil mills. The products from this processing stage have continued to compete because the oils have been almost per-

fect substitutes for each other as have the protein meals. Of course, then, when there have been surpluses of cottonseed and of soybeans, the quantities of each consumed depended upon their relative prices.

The price-support structure since 1951 has been such that even though the support level for cottonseed was lowered in 1953 and 1954, the supports on cottonseed were high enough to cause an accumulation of cottonseed products by the CCC. In contrast, soybean products moved freely into both the domestic and the foreign markets. The quantity of cottonseed has been limited by the price-support and acreage diversion program for cotton.

Under the present program, soybeans have been one of the few commercial crops for which the supply has not seemingly exceeded the demand. Farmers seem to have shifted to soybean production because of acreage restrictions for other price-supported crops and because of the high prices received for soybeans.

Future production of soybeans, then, will depend upon the price support systems in effect for soybeans, rice, cotton, and cottonseed. Soybeans have been slowly taking the market away from cottonseed, and may still be in strong demand even if the support prices between the two were equated. Restrictions on the cotton acreage will not likely terminate in the near future. Unless some restrictions are placed on the soybean acreage, soybeans will probably replace much of the restricted rice and cotton acreages.

Wheat

Wheat has never been a very stable crop in Mississippi as far as production has been concerned. It has become an

Table 2. Average prices received by Mississippi farmers for soybeans, cotton, and cottonseed, 1946-48.

Year	Soybeans		Cotton		Cottonseed	
	Price per bushel	Relative price*	Price per pound	Relative price*	Price per ton	Relative price*
1946	\$3.02	122	\$.284	133	\$61.50	117
1947	3.35	136	.333	157	88.83	170
1948	3.20	130	.330	156	84.50	161

Source: *Agricultural Prices*, Agricultural Marketing Service, United States Department of Agriculture, Washington, D. C., February, 1943, to January, 1948.

*Index of prices received by Mississippi farmers based on 1943-45 averages = 100.

important grain crop since about 1941. The acreage has fluctuated widely since then. The five-year moving averages in Figure 4 have tended to even out these fluctuations. However, statistics for individual years indicate that the acreage has varied from 3,000 in 1951 to 45,000 in 1953.⁵

Most of the wheat in Mississippi has been produced in the Delta. Since it is a crop that prefers a cool climate, the northern part of the state has been best adapted to its production. The major part of the wheat produced in 1954 was in Tunica, Coahoma, Bolivar, Sunflower, and Washington Counties.⁶ However, some wheat was produced in practically every county of the state, except in the coastal area.

Interviews with county extension and with Agricultural Stabilization and Conservation personnel during the summer of 1954 indicated that a larger acreage would be planted for winter grazing in the future. Interest in wheat for winter grazing has increased because this crop has apparently been more resistant to winter-killing than oats. Wheat for grazing has been grown primarily in the northern upland area of the state.

Whether this increased interest in wheat as a grazing crop continues will probably depend upon the way the price-support system operates in the

future in regard to acreage. As long as the support program is in operation, restrictions will probably reduce the amount grown commercially that will be eligible for the loan.

Mississippi wheat yields have been favorable compared to the national averages, Table 3. This has probably been true because most of the commercially-grown wheat in Mississippi

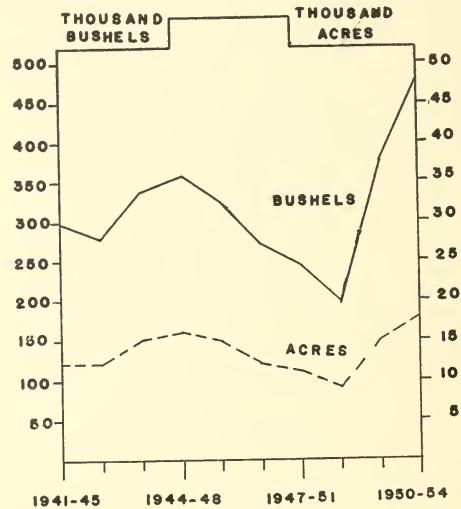


Figure 4. Five-year moving averages of wheat acreage and production in Mississippi, 1941-54.

Source: See original data in Appendix Table 6.

Table 3. United States wheat yields, and Mississippi wheat and oat yields with prices received by Mississippi farmers, 1943-52.

Year	United States wheat yields, bushels	Miss. wheat yields, bushels	Miss. wheat prices	Gross receipts per acre of wheat, Miss.	Miss. oat yields, bushels	Miss. oat prices	Gross receipts per acre of oats, Miss.	Difference between gross receipts per acre of wheat and of oats in Miss.
1943	16.6	28.0	\$1.34	\$37.52	30.0	\$0.84	\$25.20	+ \$12.32
1944	18.1	24.0	1.46	35.04	37.0	0.95	35.15	- 0.09
1945	17.0	21.0	1.45	30.45	31.0	0.76	23.56	+ 6.89
1946	17.2	22.0	1.85	40.70	31.0	1.08	33.48	+ 7.22
1947	18.4	23.0	2.31	53.13	30.0	1.10	33.00	+ 20.13
1948	18.0	22.0	2.20	48.40	33.0	1.04	34.32	+ 14.08
1949	14.9	22.0	1.77	38.94	30.5	0.86	26.23	+ 12.71
1950	16.5	20.0	1.96	39.20	25.0	1.00	25.00	+ 14.20
1951	16.0	25.0	2.09	52.25	29.0	1.03	29.87	+ 22.38
1952	18.3	26.0	2.15	55.90	37.0	1.05	38.85	+ 17.05
Average	17.1	23.3	\$1.85	\$43.15	31.4	\$0.97	\$30.46	+ \$12.69

Source: Agricultural Statistics, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1945-53.

⁵ Agricultural Statistics, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1952-53.

⁶ Data obtained from interviewing county extension and Agricultural Stabilization and Conservation personnel during the summer of 1954.

has been produced in the more fertile Delta.

Table 3 shows some interesting facts concerning wheat and oat yields and prices in Mississippi during the ten-year period 1943-52. Wheat yields have been below those of oats; however, the price of wheat has been nearly twice that of oats. Over the ten-year period shown in the table above, Mississippi farmers in the areas where wheat and oats have grown equally well would have realized an average of \$12.69 per acre more by planting wheat instead of oats. This, of course, assumed that the cost of production of the two crops would have been the same. However, it did not take into consideration the fact that the cost of the seed wheat usually would have been more than for seed oats.

There may be some question whether the oat yields in the area where wheat has been produced are the same as in Table 3, or whether they have actually been higher. Since practically all of the commercially-grown wheat has been produced in the Delta, the yield in the table should be fairly representative of the Delta. Oat yields are state averages and are probably lower than those which have been obtained in the wheat areas of Mississippi. Probably, there still has been a higher gross income per acre from wheat than from oats.

If these assumptions are valid, farmers in commercial grain production may change from oats to wheat within the limits of acreage controls. Since wheat is not very palatable as hay, it probably will not be readily substituted on livestock farms, except where the grain is to be harvested.

It would be hard to project what wheat production will be in Mississippi without restrictions and support prices on many of the crops. Its future in Mississippi as a cash grain crop probably depends almost solely on governmental action.

Rice

A use for some of the tough soils of the Delta was found when rice was

introduced in Mississippi. Rice has been a comparatively new crop in the state and limited acreage and yield data are available. Rice production has been a rapidly expanding enterprise; the acreage increased from 5,000 in 1949 to 82,000 in 1954.

All of the rice in Mississippi has been produced in the Delta, except for a small acreage in Hancock County. In the past, Bolivar County has accounted for slightly more than one-half of the total production. Washington County has ranked second with more than twice that of any county below it.

High support prices without acreage restrictions in recent years in the face of a declining demand for the product, caused acreage restrictions to be imposed for the 1955 crop. Artificially guaranteed prices encouraged increased production in the United States as well as in the remainder of the world. The price has been supported at a level high enough for other countries to come into production and under-sell the United States, and at the same time has insured the domestic farmers of a stable income for an unlimited acreage.

A study by Mehren indicated that the domestic markets could handle only about one-half of the total United States production in 1954.⁷ The government was forced to impose acreage restrictions because the 1954 crop was the largest in the history of rice in the United States in the face of a shrinking foreign market.

Acreage restrictions for the United States as a whole amounted to about a 25 percent reduction in the average for the past five years. A glance at Figure 5 will give some indication of what such legislation meant to Mississippi whose five-year average crop history was far below the 1954 acreage. Even by the time allowances were made for hardship cases, the 1955 acreage was only 48,499 acres, or little more than one-half of the 82,000 acres in 1954. However, if the same method of restriction is used in the future, Mississippi should be able to hold its

⁷ Mehren, George L., *Crisis in Rice*, California Agricultural Experiment Station and Extension Leaflet No. 34, September, 1954.

own because the low acreages of 1950 and 1951 will be replaced by higher ones after 1955 and 1956.

As with most of the other grains, future production depends upon the price-support program. It would be hard to predict what production would be without the programs, but as long as irrigation is not too much of a problem, the high yields obtained in Mississippi will probably induce production on the tough soils of the Delta which have few, if any, alternative uses which appear as profitable.

Barley

The only official data available on barley in Mississippi ceased about 1950. Data indicate that during World War II the barley acreage reached as high as 13,000 in 1944 but by 1950 had dropped to only 1,000.⁸

Estimates by county extension and by ASC personnel during the summer of 1954 indicated that approximately 22,100 acres of barley had been planted with expectations of 1,043,000 bushels. It would seem that if such a large acreage were planted in the crop, that

more data would have been available, but since no other information was available these data were accepted purely as a rough estimate. Under these circumstances, the nearest official measure of production in 1954 has consisted of the quantity which was purchased through CCC agreements and was stored for the loan. Records for a total of 99,317 bushels were processed through the Mississippi ASC State office. In all probability, some of the barley did not come up to CCC specifications and had to be disposed of in other ways. Since no official price data were available, the possibility of part of the crop having been sold on the cash market could not be determined.

If this 22,100 acres were actually harvested, barley may begin to substitute as a cash crop in the Delta for other crops that have restricted acreages. The future of barley, like that of most of the other small grains in Mississippi, depends upon the crops which have government price supports and the methods used to carry out these programs.

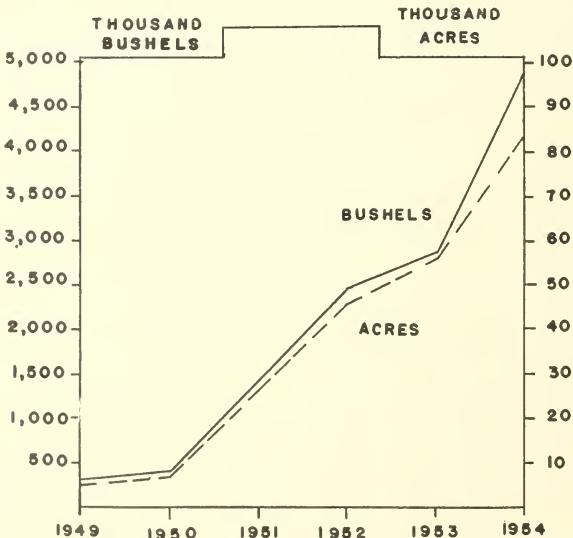


Figure 5. Rice acreage and production in Mississippi, 1949-54. Source: See original data in Appendix Table 7.

⁸ Agricultural Statistics, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1936-1952.

FEED GRAIN UTILIZATION

Corn, oats, barley, and wheat were considered feed grains; however, most of the grain used as feed in Mississippi consisted of corn and oats. Wheat is more generally considered a food grain but was included in this segment of the study as livestock feed because of the small amounts found in certain of the feeds.

Estimates were obtained from feed mills on in-shipments and out-shipments of grain during the previous year in order to determine how much grain was used as feed in the state. At best, these estimates were subject to possible judgment errors because many of the mills kept no records, and their businesses were very seasonal. Also a measure of the entire volume of grain processed for any particular period could not be obtained because new feed mills were continually springing up in Mississippi.

Most of the material in this section has been based on a recent United States Department of Agriculture publication.⁹ Even though the report covered the period October, 1949, through September, 1950, it was not published until June, 1954. Although the study was based only on estimates of grain movements between states, production in each state, and livestock numbers, it is probably the best obtainable at present.

Interstate Grain Movements

Mississippi has remained a deficit grain area, even with the expanded

production in the past few years, and has had to ship in larger quantities, especially corn, to meet feed requirements.

Table 4 gives the sources of total supply and utilization of the different grains for the year October, 1949, to September, 1950. During this period, almost 10 percent of the corn, 16 percent of the oats, and all of the barley had to be shipped in from other areas. Since production has been variable from year to year, the value of the table is concerned more with in-shipment and total utilization.

Tabulation of the shipments of formula feed for the period covered by the table indicated that Mississippi manufactured about 300,000 tons of the 400,000 tons which were fed. The other 100,000 tons, or one-fourth of the total used, had to be shipped in from other areas.

Several large feed mills in the state have been shipping large quantities of formula feeds to other areas. Therefore, instead of just receiving the difference between the amount fed and the amount manufactured, enough had to be shipped in to replace that shipped out from the state also.

Feed Consumption by Livestock Enterprises

Table 5 shows how the feeds were allocated to the different livestock enterprises for the year October, 1949, to September, 1950. Since only 44.5 percent of the formula feed was actually

Table 4. Stocks, production and utilization of corn, oats, wheat and barley in Mississippi for the year October, 1949, through September, 1950.

Grain crops	Stocks Oct. 1, 1949	Production	In-shipments	Total on hand during year	Fed as grain	Fed as formula feed	Other uses	Total utilization	Stocks Oct. 1, 1950
Thousand bushels									
Corn	2,857	41,995	4,785	49,637	40,460	4,785	3,321	48,566	1,071
Oats	1,938	4,312	1,000	7,250	3,125	2,312	688	6,125	1,125
Wheat	—	333	—	333	67	266	—	333	—
Barley	42	—	83	125	—	83	—	83	42
Totals	4,837	46,640	5,868	57,345	43,652	7,447	4,009	55,107	2,238

Source: Jennings, R. D., *Feed Consumed by Livestock, Supply and Disposition of Feeds, 1949-50*, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, June, 1954.

⁹Jennings, R. D., *Feed Consumed by Livestock, Supply and Disposition of Feeds, 1949-50*, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, June, 1954.

composed of corn, oats, wheat, and barley, the table below does not give the exact proportion of grain going to each type of livestock. An analysis of the formula feed, however, indicated that the total proportion of the four grains through both sources was not greatly different from the proportions shown below.

In order to determine present feed requirements, each of the livestock enterprises was analyzed to account for changes in numbers of livestock since 1950. With the limited available data, present feed needs were computed by assuming that the amount of feed per animal for each type of livestock did not change since the time of the Jennings study. The present needs, then, have been arrived at by multiplying these rates by the numbers of livestock. The results have been weighed in the light of present production and estimates of the movement of grain in and out of Mississippi.

Dairy cattle. Dairy cattle have been consuming roughly 15 percent of the total formula feed and of the grain feed alone to livestock in Mississippi.

An analysis of the formula feed showed that about 23.3 percent was grain.

Since the number of dairy cattle two years old and over has increased at about the same rate percentage-wise as other dairy animals, no attempt has been made to compute the present feed requirements for each group separately. Table 6 shows the total requirements of the dairy enterprise, on the basis of the number of animals on January 1 of each year. This gives some indication of the trend in dairy animal numbers and the estimated feed requirements in order to project the future demand for dairy feed. The feeding rates are not applicable specifically to any one class of dairy animals because they are averages for the entire group.

Dairy cattle numbers have shown a substantial gain over the six-year period, indicating an increasing demand for dairy feed. As long as markets can be found for the milk, the trend will probably continue in this direction, especially with continuing acreage restrictions on several of the basic crops and with the threat of cross-compli-

Table 5. Utilization of feed by livestock enterprises in Mississippi for the year October, 1949, through September, 1950.

Livestock enterprise	Formula feed utilized	Grain alone utilized	Total feed utilized	Percent of total utilization
	Thousand tons			
Dairy cattle	95	153	248	15.5
Beef cattle	—	14	14	0.9
Sheep	—	1	1	0.1
Hogs	18	424	422	27.8
Poultry	242	232	474	29.8
Horses and mules	35	343	378	23.7
Others	17	18	35	2.2
Total	407	1,185	1,592	100.0

Source: Jennings, R. D., *Feed Consumed by Livestock, supply and Disposition of Feeds, 1949-50*, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, June, 1954.

Table 6. Consumption of formula feed and grain by Mississippi dairy animals on an annual basis, 1950-55.

Year	No. of animals as of Jan. 1	Formula feeds		Corn		Oats		Total consumption, tons**
		Per head,* tons	Consumed, tons	Per head,* bushels	Consumed, bushels	Per head,* bushels	Consumed, bushels	
	(000)		(000)		(000)		(000)	(000)
1955	952	.1165	111	6.57	6,255	.23	219	321
1954	934	.1165	109	6.57	6,136	.23	215	315
1953	900	.1165	105	6.57	5,928	.23	207	274
1952	855	.1165	100	6.57	5,606	.23	197	260
1951	816	.1165	95	6.57	5,363	.23	188	248
1950	815	.1165	95	6.57	5,356	.23	187	248

Source: *Livestock and Poultry on Farm and Ranch, January 1*, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., 1951-55; and Jennings, R. D., *Feed Consumed by Livestock, Supply and Disposition of Feed, 1949-50*, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, June, 1954.

*A constant feeding rate per head was assumed throughout the period.

**Corn and oats have been converted to tons.

ance acreage restrictions for all of the supported crops.

Mississippi's average milk production per cow has been only slightly above one-half of that for the nation as a whole. Part of this low production can probably be attributed to the quality of dairy animals found in Mississippi. Also responsible is the fact that, on the average, Mississippi milk cows have been receiving only about 65 percent as much concentrates per cow as the national average. This leaves a great deal of improvement possible as far as feeding is concerned, and would require a large volume of concentrates to come up even close to the national average.

Beef cattle. Beef cattle, as used here, include all cattle other than those reported as kept for milk. Dairy-type steers and bulls would be included in beef cattle. In 1950, about 80 percent of these animals was classified strictly as beef. Since most of these received about the same kind of concentrates, they were all dealt with as one group. The feeding rates were averages for the group regardless of type or age, and should not be thought of as the rate for any particular kind of beef cattle.

Little, if any, formula feed has been used in normal commercial beef cattle operations in Mississippi. What little may have been fed would have gone to show cattle and maybe to purebred animals on a very limited scale. Only about 1 percent of the total formula feed and grain fed alone was consumed by beef cattle in Mississippi in the year October, 1949, to September, 1950.

Corn has been the only grain of any significance fed to beef animals. Most of the feed consumed by this class of livestock has been in the form of cottonseed and cottonseed meal along with hay. Winter grazing has helped to reduce the requirements for other feeds during the winter months. Since Mississippi has been primarily an area of grass-fattened cattle, about the only time concentrates have been fed was during the periods when little grass was available.

Table 7 indicates that, on the average, beef cattle in Mississippi have con-

Table 7. Consumption of corn by beef cattle in Mississippi on an annual basis, 1950-55.

Year	Number of animals as of Jan. 1	Consumption per head,* bushels	Total corn consumption, bushels
	(000)		
1955	1,128	.5820	656
1954	1,105	.5820	643
1953	988	.5820	575
1952	813	.5820	473
1951	760	.5820	442
1950	859	.5820	500

Source: **Livestock and Poultry on Farm and Ranch, January 1**, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington D. C., 1951-55; and Jennings, R. D., **Feed Consumed by Livestock, Supply and Disposition of Feeds, 1949-50**, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, June, 1954.

*A constant feeding rate per head was assumed throughout the period.

sumed only a very small amount of corn. Only slightly over one-half bushel per animal was fed in 1950 when prices for all grades of beef cattle were relatively good. This rate may have decreased when cattle prices fell in the spring of 1952 in order to reduce the cost of production. However, since most of the decrease in prices has been for the lower grades of animals, farmers may have put more emphasis on grain feeding to get more animals in the higher grades, which have fallen in price much less proportionally.

If the cross-compliance restrictions are imposed on the crops whose prices are supported by the government and the diverted acreage must be converted to conservation practices, as has been proposed, livestock enterprises which consume large quantities of grass are one of the few alternatives. The market has been such that dairy products are already hard to sell in Mississippi because of present supplies. Even with depressed beef prices for the lower grades, beef cattle would be one of the more feasible livestock enterprises.

Since the higher grades of beef will probably continue to bring a price well above that for the lower ones, the logical operation would be to breed and to feed the animals as economically as possible to get them into the higher grades. The trend should be in this direction regardless of whether it is brought about through governmental

action on the supported crops or by farmers simply attempting to maximize their income from beef cattle. Even if cross-compliance restrictions are imposed, provisions will probably be made for the production of grain eligible only for farm consumption.

It is generally agreed that grass-finished steers and heifers seldom grade "prime," and only the extreme top quality ones ever reach "choice." This means that most of the better grass-finished cattle usually fall in "good" and "commercial" grades. However, if cattle of comparable breeding and conformation are given a short-term grain finishing, they can expect to be upgraded to "choice" and "good".¹⁰

Interviews with county extension personnel and elevator and feed mill operators during the summer of 1954 indicated an increasing interest in feeding out beef animals in Mississippi. If Corn Belt farmers have been able to purchase feeder calves and make a profit on feeding them out, it would seem that Mississippi farmers should be able to produce calves on grass until shortly before marketing and then put them in the feed lot on concentrates at a profit. This would in effect market grain for farmers through higher grades of cattle which sell for more favorable prices. However, part of the benefits from producing quality beef would be offset unless farmers market their cattle through outlets which recognize and pay premiums for high quality animals. Taking into consideration the already-surplus supply of oats and possibility of increasing corn yields, Mississippi should be able to initiate such a program on a limited scale.

Sheep. The sheep industry in Mississippi has been somewhat like that of the beef cattle. Both have increased in numbers at about the same percentage rate over the six-year period. Sheep, too, have been mostly grass fed and have consumed very little concentrates because the sheep enterprise

in the South has been one of producing grass-fattened slaughter lambs.

Of the total concentrates consumed, sheep received less than 0.1 percent in Mississippi during the year October, 1949, to September, 1950. As in the beef cattle enterprise, this has been composed mostly of corn with little or no formula feed. Table 8 gives

Table 8. Consumption of corn by sheep in Mississippi on an annual basis, 1950-55.

Year	Number of animals as of Jan. 1	Consumption per head,* bushels	Total corn consumption, bushels
	(000)		(000)
1955	91	.5454	50
1954	91	.5454	50
1953	83	.5454	45
1952	77	.5454	42
1951	73	.5454	40
1950	66	.5454	36

Source: **Livestock and Poultry on Farm and Ranch, January 1**, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., 1951-55; and Jennings, R. D., **Feed Consumed by Livestock, Supply and Disposition of Feeds, 1949-50**, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, June, 1954.

*A constant feeding rate per head was assumed throughout the period.

some indication of the trend in sheep numbers in Mississippi as well as their feed requirements.

Sheep numbers will probably continue to increase in Mississippi as better management practices are worked out, but will depend upon future prices for feed and slaughter lambs. The more important management problems have been losses due to dogs and other animals, and failures to give adequate care during the winter and lambing season and to cull old ewes.¹¹

Sheep will probably never account for great quantities of grain consumption in Mississippi regardless of numbers, as long as grazing can be provided practically all year. Even if some lambs were grain-fattened in Mississippi, the amount of grain used would be insignificant in terms of the total because of the small quantities required.

¹⁰ Johnson, Jack D., **Livestock Marketing in the Southern Region**, Southern Cooperative Bulletin 26, July, 1952, pp. 66-68.

¹¹ Parvin, D. W., **An Economic Appraisal of Sheep Production in the Northeast Prairie of Mississippi**, Mississippi Agricultural Experiment Station Bulletin 495, December, 1952, p. 12.

Hogs. Hog numbers showed an almost steady decline through the first five years of the period covered by Table 9. However, the upturn in 1955 may be an indication that the trend is going to reverse itself. During the year of Jennings' study, hogs and pigs ranked second as far as total consumption of formula feed and of grains was concerned, Table 5. About 28 percent, composed mostly of corn, went to this group during the year October, 1949, to September, 1950.

Table 9 gives some indication of how total grain and formula feed requirements have declined during the six-year period, assuming feeding rates have not changed to any great extent. Any change that may have occurred in the feeding rates would be hard to detect for several reasons. First, this period was in the midst of the trend to convert from the large lard hog to the smaller meat type. Second, relatively good prices toward the latter part of the period may have influenced farmers to do a better feeding job. Third, since some hogs and corn have been produced on almost every farm, the reduction in numbers may have caused farmers to feed each animal more; however, corn production has been low since 1950 because of drought.

At present, the trend in hog numbers is hard to project. If the expectations for a large pig crop in 1955 materialize, the downward trend in numbers indicated by the above table will probably be checked. Trends will depend upon the prices for hogs and for other meat animals. Diseases have

probably had quite a bit of influence on hog numbers in the past and may continue to depress the quantity produced in the future in Mississippi. Year-to-year production will be dependent to a large extent upon the price of corn and of other concentrates.

Horses and mules. Horses and mules have been decreasing slowly in numbers at about the rate of 25,000 head a year. The decline will continue as modern machinery replaces them as workstock. As Table 5 indicated, this group has been a large consumer of grain. Table 10 gives a more thorough breakdown to show how the grain consumed by workstock has been divided between corn and oats. An analysis of the formula feed showed that it has been composed of more than a third corn and oats divided about equally between the two.

The rate and extent of decline in numbers is rather difficult to project. The rate will probably depend to a large extent on economic conditions, available labor, and trends in sizes of farms. The number of animals will probably never become completely static, but will undoubtedly decrease at a much slower rate than at present. The relatively constant number remaining will depend upon the requirements for purposes other than workstock and the number of small hill farms on which the use of modern equipment is not feasible.

Poultry. Determining feed consumed by poultry was complicated because of the different divisions of the enterprise. The approach used was to di-

Table 9. Consumption of formula feed and grain by hogs in Mississippi on an annual basis, 1950-55.

Year	No. of animals as of Jan. 1	Formula feeds		Corn		Oats		Total consumption, tons**
		Per head,* tons	Consumed, tons	Per head,* bushels	Consumed, bushels	Per head,* bushels	Consumed, bushels	
	(000)		(000)		(000)		(000)	(000)
1955	631	.0186	12	15.615	9,853	.129	81	289
1954	590	.0186	11	15.615	9,213	.129	76	270
1953	756	.0186	14	15.615	11,805	.129	98	347
1952	889	.0186	17	15.615	13,882	.129	115	408
1951	946	.0186	18	15.615	14,771	.129	123	434
1950	965	.0186	18	15.615	15,069	.129	125	442

Source: **Livestock and Poultry on Farm and Ranch, January 1, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., 1951-55;** and Jennings, R. D., **Feed Consumed by Livestock, Supply and Disposition of Feeds, 1949-50, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, June, 1954.**

*A constant feeding rate per head was assumed throughout the period.

**Corn and oats have been converted to tons.

vide this group into turkeys and chickens with a sub-division of chickens into broilers, laying flock, and chickens raised other than in commercial broiler and laying flock production. Instead of using inventories of numbers as of January 1 each year as for other livestock, averages and totals for the year have been used.

In 1950, poultry was the largest consumer of formula feed and of grain fed, receiving alone about 30 percent of the total utilization for all livestock. About half of the feed going to this group was fed as grain composed mostly of corn. However, it was through this group that any appreciable amounts of wheat and of barley were consumed, Table 4. An analysis of the formula feed used by poultry indicated that nearly 40 percent was corn.

Broiler production is the latest addition to Mississippi livestock enterprises. As shown in Table 11, broiler numbers increased from 17,000,000 in 1950 to 40,300,000 in 1954.

This enterprise has required almost 100 percent formula feed, part of which

has been manufactured in Mississippi. A large part of that manufactured in the state has been by local mills which have purchased concentrates from major feed manufacturers and have added the shelled corn. In the past, most of this corn was shipped in from other areas because a year-round supply was not available. There are few commercial corn shellers in the state to shell the corn which has been produced.

Another factor which has prevented locally-grown corn from being processed into broiler feed has been its color. Because of differences in the nutritive content, yellow corn has been preferred over white corn for this purpose. In some areas in Mississippi custom has caused farmers to produce only white corn. These factors have made it necessary for most of the corn used for formula feed for poultry to be shipped in from other areas. One of Mississippi's greatest potential grain markets has been for yellow, shelled corn available on an annual basis as the poultry enterprise needs it.

Table 10. Consumption of formula feed and grain by horses and mules in Mississippi on an annual basis, 1950-55.

Year	No. of animals as of Jan. 1	Formula feeds		Corn		Oats		Total consumption, tons**
		Per head,* tons	Consumed, tons	Per head,* bushels	Consumed, bushels	Per head,* bushels	Consumed, bushels	
	(000)		(000)		(000)		(000)	(000)
1955	266	.0921	24	29.88	7,948	4.11	1,093	264
1954	292	.0921	27	29.88	8,725	4.11	1,200	290
1953	319	.0921	29	29.88	9,532	4.11	1,311	317
1952	339	.0921	31	29.88	10,129	4.11	1,393	337
1951	368	.0921	34	29.88	10,996	4.11	1,512	366
1950	380	.0921	35	29.88	11,356	4.11	1,563	378

Source: **Livestock and Poultry on Farm and Ranch, January 1**, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., 1951-55; and Jennings, R. D., **Feed Consumed by Livestock, Supply and Disposition of Feeds, 1949-50**, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, June, 1954.

*A constant feeding rate per head has been assumed throughout the period.

**Oats and corn have been converted to tons.

Table 11. Consumption of formula feed by broilers in Mississippi on an annual basis, 1950-54.

Year	Number produced during year, million	Feed per head,* pounds	Total consumption, tons	Portion of feed which is corn, bushels
				(000)
1954	40.3	9.2	185	2,642
1953	35.1	9.2	161	2,300
1952	30.8	9.2	142	2,028
1951	23.5	9.2	108	1,543
1950	17.0	9.2	78	1,111

Source: Jennings, R. D., **Feed Consumed by Livestock, Supply and Disposition of Feed, 1949-50**, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, June, 1954; **Poultry and Egg Situation**, United States Department of Agriculture, Agricultural Marketing Service, Washington, D. C., October, 1954, and May, 1955; and **Agricultural Statistics**, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1951-53.

*A constant feeding rate per head has been assumed throughout the period.

The outlook is for the broiler enterprise, even with depressed prices, to continue at the 1954 level or even increase. Since the facilities have practically no alternative use, producers will probably continue as long as they can cover variable costs.

The group of chickens classified as "other chickens raised" is to a certain extent the replacements for the pullets and laying hens. This "other" group also includes "back-yard flocks" — broilers for home use and the small laying flock found on practically every farm.

The pullets and laying flocks consumed nearly 60 percent of the total feed going to poultry in the year October, 1949, to September, 1950. Their numbers have remained almost stable at about five to seven million head, with only slight fluctuations during the period. Present feed requirements probably have not varied far from the 272,000 tons in 1950.

Until a more adequate marketing system for handling eggs is established in Mississippi, production of laying hens will probably continue to fluctuate between five and seven million head. The decrease in the price of eggs during the latter part of 1954 and early in 1955 may have caused some of the laying flocks to be sold. Decreased inventories during this period may cause enough decrease in the egg supply to bring about a rise in egg prices during the latter part of 1955.

The "other" group of chickens mentioned above has remained fairly constant at about 11 to 12 million head. Present feed requirements by this group probably does not vary far from the 120,000 tons of concentrates consumed in the year October, 1949, to September, 1950.

Turkeys have been of minor importance in Mississippi as far as feed consumption has been concerned. In 1950 turkeys consumed less than 1 percent of the concentrates fed to all groups of poultry. Turkey numbers will vary from year to year but feed consumed will be minor unless a drastic increase in numbers is made.

Other livestock. The group classified as other livestock in Table 5 included all livestock and poultry in cities and other than those reported on farms. No reliable estimates of numbers have been made available.

Some of the types of livestock on farms for which no estimates have been available are ducks, geese, guineas, rabbits, dogs, cats, and goats. Livestock in cities included milk cows, horses, chickens, hogs, and goats.

Since no annual estimates of numbers have been made, one way to arrive at present feed requirements was to assume that, if any changes have occurred since 1950, increases and decreases have offset each other so that the total needs have remained approximately the same.

Trends in the Utilization of the Feed Grains

Changes in livestock numbers resulted in a net decrease in corn consumption in 1954 as compared to 1950 (Appendix Table 8). Poultry, and dairy and beef cattle consumption rose while the needs for hogs, horses, and mules declined. Projections into the near future would likely find the same situation except that feed requirements for hogs may begin to rise to provide for increases in their numbers.

Oats fed increased slightly in 1954, if those in formula feeds were considered. This was due primarily to increases in the volume of formula feed for poultry which contained a relatively high percentage of oats.

Since most of the wheat consumed by livestock in Mississippi was in formula feed for poultry, wheat would have increased from about 333,000 bushels in 1950 to 467,000 in 1954. Practically all of the barley also would have been used in this same way. Barley, then, would have increased from 83,000 bushels to 126,000 during this period.

Total formula feed requirements increased about 26 percent. Most of this increase, of course, went to poultry. There was no way to determine exactly how much of this formula feed was manufactured in Mississippi, but with the increased number of feed mills it

may be expected that at least as high a proportion was manufactured in Mississippi in 1954 as in 1950.

Even though corn needs had decreased nearly six million bushels from 1950 to 1954, there was a deficit of over 20 percent in 1954 (Appendix Table 8). Actually more than that amount had to be shipped in because corn was shipped from the state in formula feeds which made the deficit even greater. A large part of this corn received from

other areas was shelled, yellow corn for the poultry enterprises and that in formula feeds of the types which were not manufactured in Mississippi.

Oats, wheat, and barley production were high enough in 1954 to meet Mississippi's feed requirements. However, the local grain supply in some areas was insufficient to meet needs because large quantities of the grains went into the government loan creating local shortages.

SEASONAL PRICE VARIATIONS AND STORAGE CHARGES AND COSTS

This section presents a measure of the income, or possible loss, which may be expected from storing grain crops at estimated storage costs and points out its relationship to seasonal price movements. Estimates of income from grain storage are hard to derive, and results may be misleading because seasonal grain prices are usually based on violently fluctuating monthly prices.

Seasonal Grain Prices in Mississippi

Mississippi farmers have not been receiving the full market value for their grain crops. There has been a tendency for them to sell their grain at harvest when the market has been glutted. An analysis of prices received by farmers over a period of years indicated that a delay of several months in selling their grains has usually paid them well.

Prices of corn, oats, soybeans, and wheat received by Mississippi farmers for the post World War II period 1947-54, have been converted to a seasonal price index using a 13-month moving average to remove the trend. Price data for rice covered only the past four years. Since annual seasonal price trends for rice were not very distinct during this short period, no attempt was made to determine the trend in seasonal price variations. No price data for barley in Mississippi were available after November, 1951.

Figure 6 presents seasonal price indexes for the period 1947-54, which indicate the extent of the fluctuations in

the seasonal prices. Since the prices have been expressed as percentages, the data do not give the range of fluctuations in absolute amounts. However, absolute prices, by months, based on the average for the past eight years, can be computed by multiplying the average annual price for any year, or any group of years, by the percentages in Figure 6, or Appendix Table 9. Seasonal prices derived by the above method simply indicated what has occurred on the average during the eight-year period; however, the actual prices during any particular period included in the graph may have been contrary to the general pattern.

Since seasonal prices have continually shifted from time to time, they must be handled cautiously in order to determine the trend in the amount of the fluctuations and the consistency of prices to follow the same pattern from year to year.

Past seasonal price behavior for the various grains. A brief description and explanation of the price pattern for each grain is necessary, because of the trend in the range of the fluctuations and the consistency of the prices to follow any set pattern have varied from one crop to another. The range of fluctuation has been widest for soybeans and least pronounced for wheat.

Soybeans. Soybean prices over the eight-year period were at the maximum in May and at the minimum in October. A year-by-year analysis of the actual prices indicated that in six out of the

eight years the maximum actually occurred in May, but only in three years did the lowest price come in October. The range of fluctuations from the lowest price of one fall to the highest of the next spring disregarding trend, varied from \$.20 to \$1.15 per bushel. In all instances, the crop was worth more the following spring than at harvest.

Mere observation indicated no significant trend in the amount of variation; however, some evidence existed that farmers were awakening to the wide soybean price spread.¹² Soybean prices for the spring of 1955 were above those at harvest in 1954, but from indications through May, 1955, the seasonal high occurred in February. The average United States price, however, was lower in May than during the normal seasonal low of October. Therefore, as soon as storage facilities become available, farmers in Mississippi may find the range of price variations for soybeans reduced.

Oats. Oats had a peculiar seasonal price pattern over the period of study. Instead of having one high and one low price, the crop reached a maximum of 106.5 percent in November, fell through February to 101.1 percent, and rose again to 104.7 percent in April. The low occurred in July at 89.2 percent. An analysis of the original data showed that during the eight years studied, prices reached their first peak in the above pattern three times in November, once in April, and reached their lowest level four times in July.

The price for oats was higher in the fall than during harvest in the summer, except for one year. The amount of variation ranged from 17 to 35 cents per bushel during the years when the price in the fall was higher than that of the previous summer. The second price peak in April has not been as distinct as the one in November. If no correction is made for trend in the original data, the differential from the low at harvest to the high in the fall has averaged about 18 cents per bushel. The

average range between the high and low has been somewhat reduced by prices during the one year, which did not follow the normal seasonal price pattern.

The double peak in oat prices may have been caused by the nature of the competition between oats and corn. The arrival of corn upon the market immediately after the peak price for oats may have driven oat prices down. Later in the spring the demand for oats as workstock feed may have bid oat prices back up.

Corn. Of the grains under study, corn ranked third in percentage fluctuations of prices. Over the eight-year period, the highest prices have usually occurred in July and the lowest in November. The high price actually was reached in July twice, and the low occurred four times in November. In every year during the period, corn was worth more in the following summer than it was the previous fall.

The range of the price differentials for corn has varied from 5 to 60 cents per bushel. The average, however, has been 27 cents per bushel. No significant trend appears to have developed in the amount of price spread for corn.

Wheat. Of the four grains whose prices were analyzed, wheat has shown the least amount of percentage fluctuation. The large stocks of wheat held by the CCC may have accounted for this behavior. When wheat prices were adjusted for trend, the highest index of price was reported in January and the lowest in August. Neither extreme in the actual prices received was very distinct. However, an average of the actual prices indicated a differential of 23 cents per bushel during the eight-year period.

Observation of the absolute prices revealed no significant trend in the tendency of the range of the price fluctuations. During the period 1947-54, wheat was worth more either in the late fall or the following spring than it was at harvest.

¹² For instance, some comments on soybean stocks in **Crop Production**, Agricultural Marketing Service, Crop Reporting Board, United States Department of Agriculture, Washington, D. C., April 1, 1955, p. 7.

Seasonal trends in grain prices. To summarize briefly, distinct seasonal price fluctuations existed during the period 1947-54 in the price of soybeans, oats, corn, and wheat. Mere observation showed no significant indication of changes in the amount or pattern of seasonal price variations.

Some evidence in the early part of 1955 has indicated that farmers may have become aware of the price differentials for soybeans. As farmers dis-

cover the wide ranges of seasonal prices for some of the crops and begin to take advantage of these spreads by storing, the seasonal differentials should approach a range that reflects storage costs, plus the risk of carrying the grain to a later time.

Grain Storage Charges and Costs

No detailed study of storage costs for the individual grains was undertaken in this study. However, several such stu-

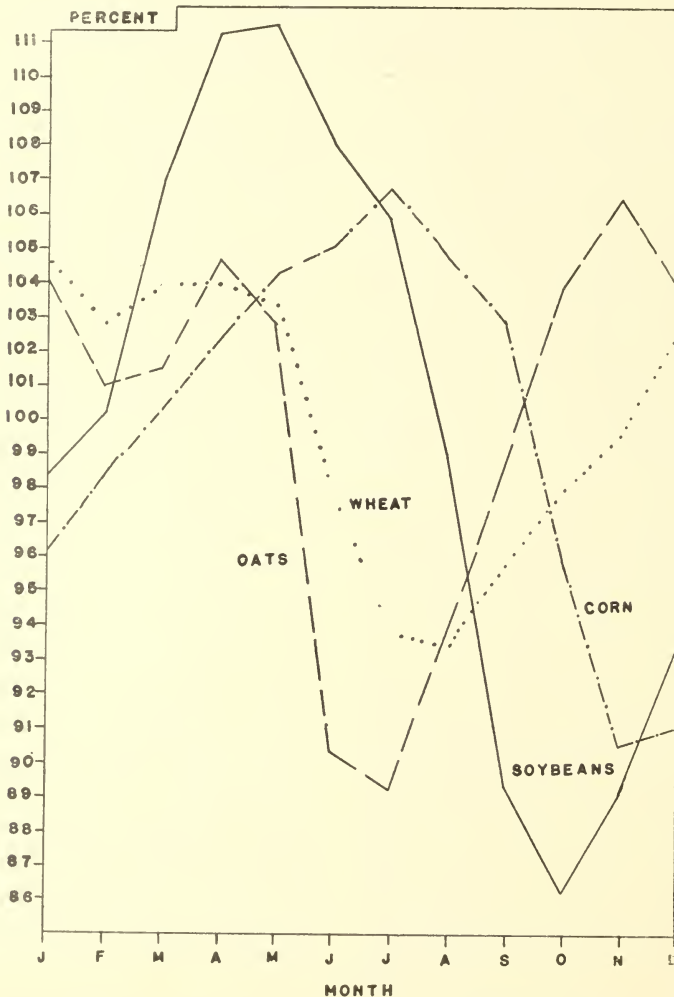


Figure 6. Seasonal index of monthly prices received by Mississippi farmers for corn, oats, wheat, and soybeans, 1947-54.

Source: See original data in Appendix Table 9.

dies have been made fairly recently in some of the other Southern states.¹³ Costs have been mentioned briefly in order to present an estimate of what farmers can expect if they store their grain and take advantage of the seasonal price variations.

Estimates of storage costs presented in this study are not in all instances complete and in some cases only hypothetical. However, these limitations have been pointed out, and methods of determining the exact cost in specific cases mentioned. Since costs have varied from one season to the next, the data presented in this section should be of more value as a guide than as specific amounts.

This section presents costs for different methods of storing, which includes steel bins on the farm, other types of farm storage, commercial elevators, and commercial bins.

Costs of storing grain in steel bins. The fixed costs for storage in steel bins can be fairly accurately computed because installation costs for most types of bins have been almost uniform. However, no farm data have been obtained in Mississippi on the variable costs for grain storage for farm structures. Some of the studies mentioned above have presented these costs. However, these data may not be readily adaptable to Mississippi conditions.

Table 12 was developed as a hypothetical example to give some indication of the cost of erecting a 1,000-bushel steel bin. Most bins of this size

cost about \$400 installed. The expected life of the bin should be 25 to 30 years with few, if any, repairs.

The estimated annual cost of such a bin was \$29 based on an interest rate of 4 percent. This rate of interest was selected because government loans amounting to 80 percent of the cost of the storage structure can be obtained at 4 percent interest. The insurance and tax rates are the same as those used in the North Carolina study.

The major determinant of the fixed costs per bushel has been the capacity to which the structure has been used. As indicated in the Table below, the fixed cost per bushel of storing 250 bushels of grain in a 1,000-bushel bin has been four times the cost of using the bin to capacity.

The difficulty of completing an estimate of the cost of storage in metal bins has been the lack of data on the variable costs. The most important of these have been labor, shrinkage, quality deterioration, insect and rodent control, and loan and interest charges where government loans have been obtained. Quality does not in all cases deteriorate, and in some instances, it may actually improve. Under such circumstances, the change of quality would be an income rather than a cost.

Some of these costs have been constant from one state to another. The loan and interest charges can be computed from a table of rates. The loan or service charge for all grains stored on farms, except rice, has amounted to

Table 12. Estimated annual fixed costs for a 1,000-bushel steel bin.*

Cost	Annual cost	Cost per bushel			
		1,000 bushels	750 bushels	500 bushels	250 bushels
	Dollars	Cents per bushel			
Depreciation @ 4%	16	1.60	2.40	3.20	6.40
Interest @ 4%	8**	.80	1.20	1.60	3.20
Insurance	3	.30	.45	.60	1.20
Taxes	2	.20	.30	.40	.80
Total	29	2.90	4.35	5.80	11.60

Source: Devised from a similar estimate by W. D. Toussaint and John M. Curtis, *Grain Storage in North Carolina—Does It Pay?*, Department of Agricultural Economics, Agricultural Economic series No. 33, North Carolina State College, June, 1954, p. 33-34.

*Based on an original cost of \$400 for the bin.

**Based on \$200 or the average principal instead of the entire \$400 as was done in the North Carolina study.

¹³ Toussaint, W. D., and Curtis, John M., *Grain Storage in North Carolina—Does It Pay?*, Department of Agricultural Economics, Agricultural Economics series No. 33, North Carolina State College, June, 1954; and Efferson, J. Norman, et al., *An Economic Study of Rough Rice Storage in the Southern States*, United States Department of Agriculture, Agricultural Marketing Service, Marketing Research Report No. 75, November, 1954.

1 cent per bushel with a minimum charge of \$3.00. For rice these rates have been \$5.00 for each lot sampled and 2 cents per hundred pounds with a minimum of \$3.00. The interest rate on all grain loans has been 3.5 percent per annum from the date of disbursement of the loan.

Labor cost for filling the bins should not have varied far from those for disposing of the grain directly at harvest. Emptying of the bins in most instances usually comes at a slack period as far as the labor force has been concerned. Costs of these two operations, therefore, should not have been of any great significance. However, computation of the cost of turning the grain in the event it were stored with too high a moisture content involves some difficulties.

Rodent control can be eliminated by the use of steel bins. Insect control, however, has created another problem as far as the computation of costs has been concerned. No farm data have been made available on this subject in Mississippi. If data were available, it would contain only estimates for a selected sample of bins and would not be of any great value because insect infestations vary from season to season and from one grain to another.

As was the case with insect control, no farm data have been obtained on shrinkage and quality deterioration for Mississippi. Both shrinkage and quality deterioration have been largely dependent upon the moisture content of the grain when it was placed in the bins. These factors also have varied with the seasons and kinds of grain.

While a reliable estimate of average variable storage costs could not be made from data available in this study, consideration of variable factors point-

ed out above should aid producers in reaching storage decisions.

Costs of farm storage in other structures. Storage on the farm in structures other than in steel bins has made the computation of cost almost impossible because of the many varied types of facilities. Each type of facility has involved different costs.

The cost of storing in most steel structures can be computed somewhat like that for steel bins. Facilities constructed of less durable materials, such as wood, have involved additional costs for repairs. Some farm bins have not been rodent proof and have required additional costs for rat and mice control.

Even though several of the other costs have changed from those for steel bins, most farmers should be able to compute at least their fixed storage cost and part of the variable ones.

Commercial elevator storage rates. All of the commercial elevators under storage agreements with the CCC reported charging the maximum storage rates as established by the CCC. Therefore, the rates presented in this section were obtained from the CCC schedule of rates for varying intervals of time. Usually the elevators have used these rates regardless of whether the grains were stored for the loan or for some other purpose. Except for grain stored in some of the cooperatively-owned elevators, a large part of that stored in the commercial elevators under storage agreements in Mississippi has been for government loans.

Table 13 shows the CCC schedule of rates for the different grains for varying intervals of time. Determination of charges simply involves the addition of the handling charges to the storage rates for the desired length of

Table 13. Maximum commercial handling and storage rates in Mississippi as allowed by CCC for selected grains for varying intervals of time.

Crop	Handling charges		Storage charges			
	Receiving	Loading out	3 months 91 days	6 months 183 days	9 months 274 days	12 months 365 days
Cents per bushel						
Oats	3.0	0.5	3.0	6.1	8.8	11.2
Corn	4.0	0.5	4.6	9.2	12.6	15.7
Barley	5.0	0.5	4.6	9.2	12.6	15.7
Wheat, soybeans, and rice	7.5	0.5	4.6	9.2	13.5	16.5

Source: 1954 Commodity Credit Corporation "Schedule of Rates," CCC Form 25-1, March 31, 1954.

storage. Payment of these rates, provided they are the ones used by the elevator, relieves the farmer of all responsibility of caring for his grain until it has been sold or returned to his farm. This responsibility for the grain has gone so far as to include shrinkage and quality deterioration. Grain placed in the loan involves a more complicated procedure for cost determination.

When grain is stored for a loan, the same service and interest charges are paid as outlined previously under cost of storage in steel bins. Also the farmer pays for the storage charges before and during the time he has a loan on the grain. If the farmer allowed the CCC to take possession of the grain, he does not pay the handling charges. In the event the farmer has paid the handling charges before obtaining the government loan, a refund is given to him. However, if a farmer chooses to redeem his grain, he has to pay all the above charges. These include service, interest, handling, and storage.

Commercial bin storage rates. In 1954, there were two groups of commercial bins in operation in Mississippi. The larger of these operations was a privately-owned business located at Greenwood. The storage facilities, which were farmer owned, consisted of 86 bins with capacities of 2,200 bushels each.

The other bins, located at Booneville, were cooperatively owned. This storage operation has been performed with 19 bins having a capacity of 1,000 bushels each.

Since each business was operated differently, they are discussed separately here. Under both arrangements farmers obtained government loans in the same manner as for on-the-farm facilities. Also in both cases, the farmers were relieved of most of the responsibility for the condition of the grain.

Farmers were charged \$25 per year as rent for the lot on which their bins were located at Greenwood. Then as handling charges, they paid 5 cents per bushel for oats and 10 cents per bushel for all other grains. Table 14 presents a clearer picture of this operation.

Computation of the cost of storing a particular grain involves only the addition of the handling charge to the storage charge, as made up by the rent of the lot, plus the fixed cost of the bin. No fixed cost data were available for the 2,200 bushel bins, but the cost per bushel should have been near if not below that found in Table 12.

Instead of owning the bins and paying both rent and handling charges as at Greenwood, the farmers at Booneville pay a fee of \$90 for the use of the bins. These bins were erected chiefly to assemble soybeans for the market. The cooperative has assumed responsibility for soybeans if the moisture content has been 14 percent or lower.

The charge for storing 1,000, 750, 500, and 250 bushels of grain has been 9, 12, 18, and 36 cents per bushel, respectively. With such an arrangement, farmers have hardly been able to afford storage of much less than the bins' capacities.

The rent has been set at \$90 per year in order to pay for the bins in four years. Farmers in the area have been encouraged to purchase their own bins and to locate them on the area owned by the cooperative. The goal of this program has been to assemble large quantities of soybeans convenient to loading-out facilities and to the supervision of the Booneville farmer-cooperative manager.

In the case of both groups of bins, the management of the bins assumed responsibility for losses other than shrinkage and normal quality deterioration of the grain. Normal quality deterioration, in this instance, refers to change in quality through no fault

Table 14. Handling and rent charges for storing various quantities of grain at Greenwood, Mississippi, in 2,200-bushel commercial grain bins.

Crop	Handling charges cents per bu.	Annual rent of lot dollars	Rental charge per bushel			
			2,200 bushels	1,650 bushels	1,100 bushels	550 bushels
Oats	5	25	1.14	1.52	2.27	4.54
Other grains	10	25	1.14	1.52	2.27	4.54

of the management of the storage facilities.

The above charges for storage in commercial bins probably have not been far from those for storing grains in commercial elevators and in steel bins on the farm. Lack of a measure for the value of the several services and of variable costs has prevented a more thorough comparison of the costs of storing in the different types of facilities.

Theoretical Storage Income

An attempt to determine possible gains from storing grain by relating past seasonal price fluctuations with storage costs is of little value as evidence of an exact income in the future for any specific period of time. However, a study of these relationships should serve as an indication of what might be expected. At least a brief summary of the relationship between seasonal prices and storage costs is necessary to point out to farmers some of the possible opportunities of holding their grain for a few months in order to obtain a more favorable price.

During the period 1947-54 the seasonal price spread per bushel averaged 76 cents for soybeans, 18 cents for oats, 27 cents for corn, and 23 cents for wheat. Commercial storage and handling charges for nine months, based on 1954 rates, were 22 cents for soybeans, 12 cents for oats, 17 cents for

corn, and 22 cents for wheat. Nine months of storage has usually been sufficient for all of the grains to reach their seasonal peak in prices if storage began at harvest. The differences between the average price spread and the commercial storage rates for 1954 were 54 cents for soybeans, 6 cents for oats, 10 cents for corn, and 1 cent for wheat.

Differences between charges for storage in commercial bins at Booneville, (assuming storage at 100 percent of capacity) and seasonal price spreads were 67 cents per bushel for soybeans, 9 cents for oats, 18 cents for corn, and 14 cents for wheat. It should be borne in mind that storage charges in this case were compiled for an entire year, rather than on a nine-month basis as was done for commercial storage, since the bins were rented on an annual basis.

The two comparisons above were used because data on storage cost were more nearly complete for these types of facilities. A further warning is necessary to remind farmers not to take the above differences between storage charges and seasonal price spreads as an established margin of net income, but to handle these data as a reflection of what has occurred in the past and as a guide in determining future income expectations. Seasonal price spreads depend upon supply and demand factors and may or may not follow a seemingly established pattern of the past.

STORAGE FACILITIES

A numerical measure alone of the capacity of grain storage facilities in Mississippi would not describe the storage situation without an explanation of the adequacy of such facilities. Therefore, the storage facility situation has been described rather than stated as so many bushels of capacity. A description of the storage operation points out in itself why a numerical measure of the capacity of the facilities is little more than one of many clues to the adequacy.

Types of Facilities

Grain storage facilities in Mississippi have been broken into two broad groups

for the purpose of this study. The basis for this division has been the classification given government grain loans under the price support programs. The two major categories have been commercial elevators and on-the-farm facilities. Under this system of classification, on-the-farm facilities have not necessarily been located on farms but may have been elevators or bins centrally located at loading-out sites. The groups of commercial storage bins at Greenwood and Booneville have both been included in this category. Even though these bins were not located on the farms of the producers

who used them, loans for the grain placed in the bins have been processed as if the farmers were performing the storage operation.

Commercial elevators. Commercial elevators have been divided into those under storage agreements with the CCC and those not under agreements. Grain storage agreements are contracts between elevators and the CCC. The elevators agree to accept and store grains, associated with the price support program, up to the capacity stated in the agreement. The management assumes all responsibility for the grain, including shrinkage and quality deterioration.

Practically all of the larger elevators in the state were under storage agreements in 1954. However, the elevators at Natchez and Vicksburg have been acting in the capacity of terminal and sub-terminal warehouses. Instead of providing commercial storage facilities for farmers, these elevators have been more interested in buying and selling operations. Some elevators are corporations owned by farmers who have preferred not to enter into contracts with the CCC but to use their facilities as farm storage.

Most of the smaller elevators have had handling agreements with the CCC to load out the grain from farm storage facilities. Their capacities have been so limited that it has been of minor importance for the storage of grain over a long period of time.

Elevators operating under storage agreements. Commercial storage agree-

ments have been of two types. For storage purposes, rice has been separated from the other grains and contracted under a rice storage agreement. All other grains have been handled under what has been known as a uniform storage agreement. Commercial facilities have been contracted under one or the other of the agreements even though the elevators may have been adapted to storage of both groups of grain. Since most of the contracts between the elevators and the CCC have been for only a year, the elevators capable of handling both rice and the other grains have had opportunities to re-allocate part or all of the facilities to the other grains. Usually, however, the elevators were constructed to handle specific grains and have not been readily converted from one group of grains to the other. Therefore, the elevators under storage agreements have been separated into two groups, corresponding to the type of agreement under which they operated in 1954.

Still another classification has been made of the commercial elevators under storage agreements. The type of ownership has had vast influence on the operating policies of the elevators. Table 15 has been devised to present a view of the ownership of elevators under each type of agreement in 1954.

Even though only half of the commercial elevators under uniform grain storage agreements were cooperatively owned, this group included nearly two-thirds of the capacity in 1954. Rice elevators, on the other extreme, were

Table 15. Number and capacity of grain elevators contracted by the CCC under uniform grain storage and rice storage agreements, by types of ownership, 1954.*

Type of ownership	Elevators contracted under uniform grain storage agreements				Elevators contracted under rice storage agreements**			
	No. of elevators	Total capacity of elevators	Average capacity of elevators	Percent of total	No. of elevators	Total capacity of elevators	Average capacity of elevators	Percent of total
		1,000 bushels				1,000 bushels		
Cooperatives	6	916.2	152.7	63.6	2	475.6	237.8	20.7
Individually-owned businesses and corporations	6	524.1	87.4	36.4	10	1,818.0	181.8	79.3
TOTALS	12	1,440.3	—	100.0	12	2,293.6	—	100.0

Source: United States Department of Agriculture, Commodity Stabilization Service, Commodity Office, Reports "Warehouses Approved Under Uniform Rice Storage Agreements," (Mimeographed), April 1, 1955, and "Warehouses who have executed CCC Form 25, Uniform Grain Storage Agreements, or CCC Form 38-3, Agreement for Handling of Grain Through Country Elevators, with CCC," (Mimeographed), January 3, 1955, Dallas 26, Texas.

*Elevators at Natchez and Vicksburg excluded for reasons mentioned previously.

**Included facilities for storing both bulk and sacked rice.

mostly privately-owned businesses and corporations. However, a total of 847,000 bushels of the capacity owned by individuals and corporations was not facilities for handling bulk grain but only for storing sacked rice.

Under both types of storage agreements, the average capacity for the cooperatively-owned elevators was larger than that owned by individuals and corporations. This difference in size can probably be accredited to the purpose for which the facilities were constructed. Most of the elevators owned by individuals and corporations were constructed more for buying and selling operations than they were as storage facilities for farmers. In contrast, the cooperatively-owned facilities were erected primarily as storage facilities for government loans and as assembling points for marketing farmers' grain.

Elevators not under storage agreements. A few elevators were not under storage or handling agreements in 1954. The capacities of these facilities were of varying sizes and were often erected for storage or marketing of a specific crop. Usually these facilities have been owned on a limited partnership basis or as corporations by farmers or by a large processing firm of the specific crop handled by the elevator.

Most of these elevators have been eligible for storage agreements. However, the elevators which are limited partnerships or corporations owned by farmers usually preferred not to come under such agreements but to obtain loans on their grain as if it were in farm storage facilities.

The significance of these elevators as marketing and storage facilities has been hard to determine because of the degree to which they have specialized and because many were so small that no measure has been made of their capacities.

Elevators under handling agreements. Elevators in either of the above two groups with receiving and loading-out facilities have been eligible for handling agreements with the CCC. Elevators under uniform grain storage agreements may or may not have a handling

agreement because they actually perform handling functions along with storage operations. In contrast, an elevator can contract for the handling functions without performing the storage operations.

Handling agreements have not been classified by types of grain as have the storage agreements. As mentioned earlier, many of the smaller elevators have been contracted under this agreement. Most of the facilities have had only enough capacity to assemble several kinds of grain in carload lots. In 1954 there were six such elevators with an average of 32,500-bushel storage capacity. All were owned by individuals or corporations. Probably the reason none were cooperatively owned has been that most of the cooperative elevators have performed handling operations for their patrons.

Farm storage facilities. Since only a small part of the grain produced in Mississippi has gone into government loans, storage facilities for the grain which has not gone into the loan have also created a problem. This grain has been stored for later use on the farm or for sale at the time when prices were more favorable. Facilities for the grain stored for other than loans have been composed of the conventional bins and cribs.

Shortage of storage facilities eligible for storing grain for loans, however, has caused grains to be sold at prices far below what could have been obtained had facilities been available. Therefore, the major part of this section has been devoted to a description of the facilities which have been eligible for storing grain in the loan.

Facilities on farm for grain stored for CCC loans. Facilities discussed in this section as farm storage have covered all those in which grain has been stored for a government loan other than elevators under storage agreements. According to the loan contracts between farmers and the CCC, the farmers have been responsible for the condition and amount of grain stored in farm facilities. However, in some instances, farmers have been able to pass part, if not all, of this responsibility to oth-

ers by storing in commercial bins and elevators not under storage agreements.

Elevators with storage agreements have had to come up to certain specifications outlined and then approved by the CCC. Farm facilities, however, have been the responsibility of the county ASC committees. Specifications for the facilities have not been very well outlined by the CCC but have been left to each county committee. This lack of regulations has resulted in vast variations from one county to the next as to what has constituted an eligible facility for a loan.

Probably the best division of farm facilities classified as on-the-farm would be into elevators not under storage agreement which store for farmers, commercial bins, metal bins on the farms, and all other eligible farm structures. Actually what has constituted eligible farm storage facilities in a particular county has been defined by the county committee in that county. In 1954, farm storage in Mississippi varied all the way from only steel bins in some counties, to practically any wooden structure which kept the grain off of the ground and had a roof to keep out precipitation in others. Therefore, what did and did not constitute eligible farm storage in 1954 has not been clearly defined.

Since the elevators without storage agreements, commercial bins, and steel bins on farms have already been discussed, no further mention has been made in this section. However, some of the types of other farm structures have been listed.

Most of these other structures have consisted of wooden bins, converted tenant houses, old plantation stores, and so on. A few Quonset-type facilities have been erected in the Delta for rice storage. As far as durability has been concerned, these Quonset buildings would rank near that of the steel bins.

Facilities on farm for grain not stored for CCC loans. Thus far, all of the discussion has consisted of a description of the grain storage facilities which have been eligible for storing grain under government loans. In 1954 only about 14 percent of the corn, oats,

wheat, barley, soybeans, and rice produced in Mississippi went into storage for government loans. Probably part of the grain, not stored for the loan, was marketed at harvest and taken from the state. The major portion, however, did not leave Mississippi but was stored in bins and cribs for livestock feed or for sale later.

Except for part of the oat and rice crops in 1954, farmers have managed to store most of the grain crops in the past. Those who did have to sell their grain at harvest usually received much less than they would if they had been able to have stored beyond the seasonal slump in prices at harvest. Simply because farmers have managed to store most of their grain does not necessarily indicate that sufficient storage facilities have existed.

One of the major complaints by county extension and ASC personnel, when interviewed in 1954 concerning storage facilities, was not so much that the capacity of the facilities has been inadequate but that existing facilities were sub-standard. Probably the worst defect of these structures has been the inability of farmers to control insects and rodents. Most of the facilities have not been constructed tightly enough for fumigation for insects and for the control of rats and mice.

Capacity and Distribution of the Storage Facilities

A measure of the capacity and distribution of the storage facilities in Mississippi has been complicated by the various classification of facilities and by the difficulty of obtaining information. The data on capacity of facilities under the storage agreements were obtained by personal interviews and from materials furnished by the CCC. The capacity of most forms of farm storage has not been so easy to estimate.

The capacity and distribution of facilities has been discussed as elevators under storage and handling agreements and as farm facilities. Rather definite data were obtained on the capacity of the elevators under storage and han-

dling agreements. However, only limited data were available on farm facilities.

Elevators with handling and storage agreements. Even though accurate data were available for the volume of the elevators under storage agreements, operating methods have prevented this volume from becoming the effective storage capacity. Actually, the elevators normally have been able to store only about 85-90 percent of their stated capacity or even less if an elevator has a handling agreement also. About 10-15 percent of the capacity of the elevators has been kept vacant to allow room for turning the grain to prevent spoilage.

The amount of unused capacity has depended upon the type of elevator and kind of grain stored. Usually this unused capacity has consisted of one elevator bin. The amount of turning, of course, has depended upon the grain stored and its moisture content.

Another factor which has caused the effective capacity to be below that stated in the storage agreement has been elevators with handling agreements in combination with storage agreements. Loading out grain directly from the farm has often involved assembling some grain in the elevators to obtain car-loads of grain of the same grade. Of course, the vacant bin for turning the stored grain has been used to a certain extent for this purpose.

Mention should be made of the purchase agreement programs by the government. Under these programs, the CCC takes possession of the grain directly from the farmer without first obtaining a loan. The storage facilities used until the time the CCC takes possession of the grain have been those selected by the farmers regardless of whether the facilities would have been eligible for storing grain in the loan or not. Since grain handled in this manner has had to be shipped at the same time as that stored for a loan in elevators and on the farm, it has served to add pressure on the elevators already operating at near full capacity.

Figure 7 gives some indication of the volume and distribution of the ele-

vators under storage and handling agreements. The elevators in each county have been grouped by the type of storage operation which they have contracted to perform. The distribution of the elevators indicates that practically all commercial storage facilities in Mississippi have been located in the Delta. Except for the elevator at Natchez, the center of concentration has been around Washington County. Most of the commercial facilities in this county have been the large rice elevators at Greenville.

Most of the Delta and Brown Loam Counties which had no elevator in 1954 had a large number of farm storage facilities, Figure 8. A combination of these facilities, Figures 7 and 8, as shown in Figure 9 indicates fairly distinctly the commercial grain area of Mississippi, with the exception of the Northeast Praire. However, much of the grain produced in the Northeast Praire has been for livestock feed.

The elevators at Vicksburg and Natchez were included in Figure 7, even though they have been of little value as storage for farmer-owned grain. The agreement held by the elevator at Vicksburg has allowed it to store for farmers; however its chief value, as has the one at Natchez, has been to handle grain already owned by the CCC and as an outlet for Mississippi grain. The elevator at Vicksburg has been operated in combination with grain-processing operations. Not only has the elevator at Natchez been an important outlet for Mississippi-produced grain at harvest but also an inlet for the deficit grains, especially corn.

Farm storage facilities. The capacity of farm storage facilities has not been as easily estimated as it has for commercial facilities. Attempts were made to obtain estimates of the storage facilities on the farms which would be eligible for storing grain for a government loan, in the event the farmer desired such storage. As mentioned previously, storage qualifications have been too variable from one county to the next for such an estimate to be of any significance. Often during the summer of 1954, extension and ASC

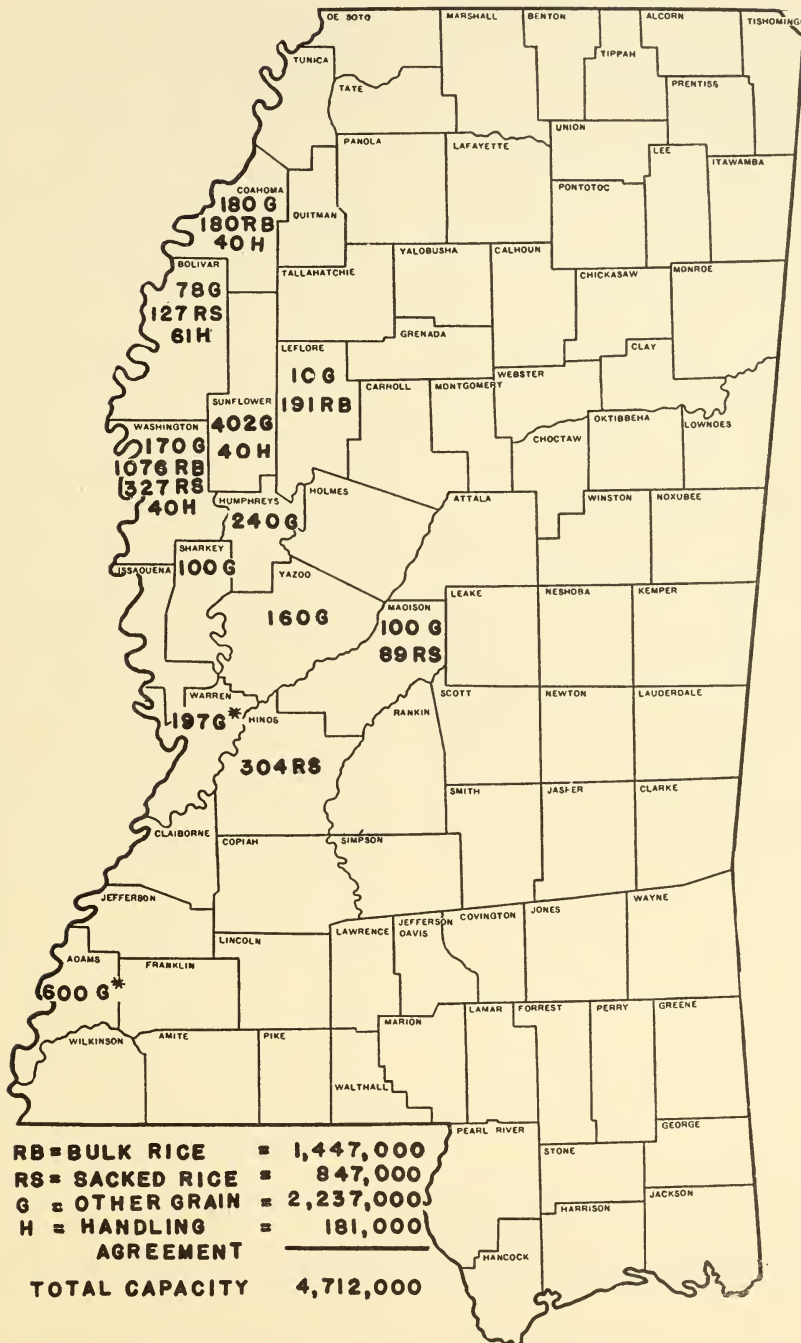


Figure 7. Capacity and distribution by counties of elevators under rice, uniform grain storage, and handling agreements in Mississippi, 1954.

*Terminal and sub-terminal elevators.

personnel being interviewed would admit that an estimate of the facilities within the county would be little better than a wild guess.

The only accurate measure of farm facilities with state-wide acceptance as storage for government loans has been of those purchased through the government farm storage facility loan program. These facilities have by no means been the only ones of their kind in the state because many have been purchased through other means. Since no record of facilities obtained by other methods has been kept and no reliable estimates were available, these other facilities could not be measured. No doubt many wooden structures, which have come up to storage specifications, have been built on farms.

Realizing that the data are far from complete, Figure 8 was devised to show the capacity and distribution of farm storage facilities purchased with government loans. The commercial bins at Booneville, Prentiss County, were added to those purchased through loans. As the bins at Greenwood, Leflore County, have been farmer owned, probably a large part of them have been included in the total county capacity.

Since the program of loaning to farmers for the purpose of purchasing storage facilities was initiated, 1,341 loans have been made in Mississippi for a total of 5,865,257 bushels of storage capacity at a cost of \$2,096,649. The average loan has been for \$1,563 for 4,374 bushels of storage capacity at a cost of \$.28 per bushel capacity.¹⁴ The cost data are of little significance because the maximum loans have only covered 80 percent of the cost of construction of the facilities. About one-third of the facilities mentioned above was erected between April 15, 1954, and February 15, 1955.

The distribution pattern in Figure 8 has not varied far from the one for commercial facilities. However, farm facilities in Figure 8 have begun to spread out into the Brown Loam Area. Another interesting observation is that

more loans have been made in the Delta counties where there have been no commercial facilities.

Storage Facilities and CCC Grain Loans in 1954

To present a brief view of how the balance between storage facilities and loans stood in 1954, Figure 9 was developed. If storage facilities had actually operated in 1954 in the way Figure 9 indicates, they would have been adequate.

As pointed out before, the effective storage capacity of elevators has been only 80-90 percent of its stated capacity mostly due to turning of the grain to prevent spoilage and to handling agreements. Also some of the elevators have been specialized and have not been able to handle all of the grains. A good example of these specialized facilities has been those for handling sacked rice. Distribution of facilities has always had an important effect upon their usefulness. One of the elevators has been operated such that the farmers have removed their oats before the maturity date of the loans in order to store soybeans.

An operational problem has also reduced the useful capacity of elevators, especially in the ones cooperatively-owned. The difficulty of allocating storage capacity to the patrons has involved all types of complications. In many instances, storage capacity has been wasted by the system of allocation. In some of these cases, the farmers have had to pay for their unused capacity; but in other instances, they have not.

Closely related to the problem of allocation of storage capacity has been the decision on which crop to by-pass and which to store. Some of the cooperative elevators have gone practically empty because of a decision by the manager and board of directors not to store oats but to wait for soybeans. Then when harvest came, the price of soybeans would be above the loan price, and farmers would sell on the cash

¹⁴ Memorandum, "Summary of Loans Disbursed Under Farm Storage Facility Loan Program Up to February 15, 1955", Mississippi ASC State Office, Jackson, Mississippi, March 8, 1955.

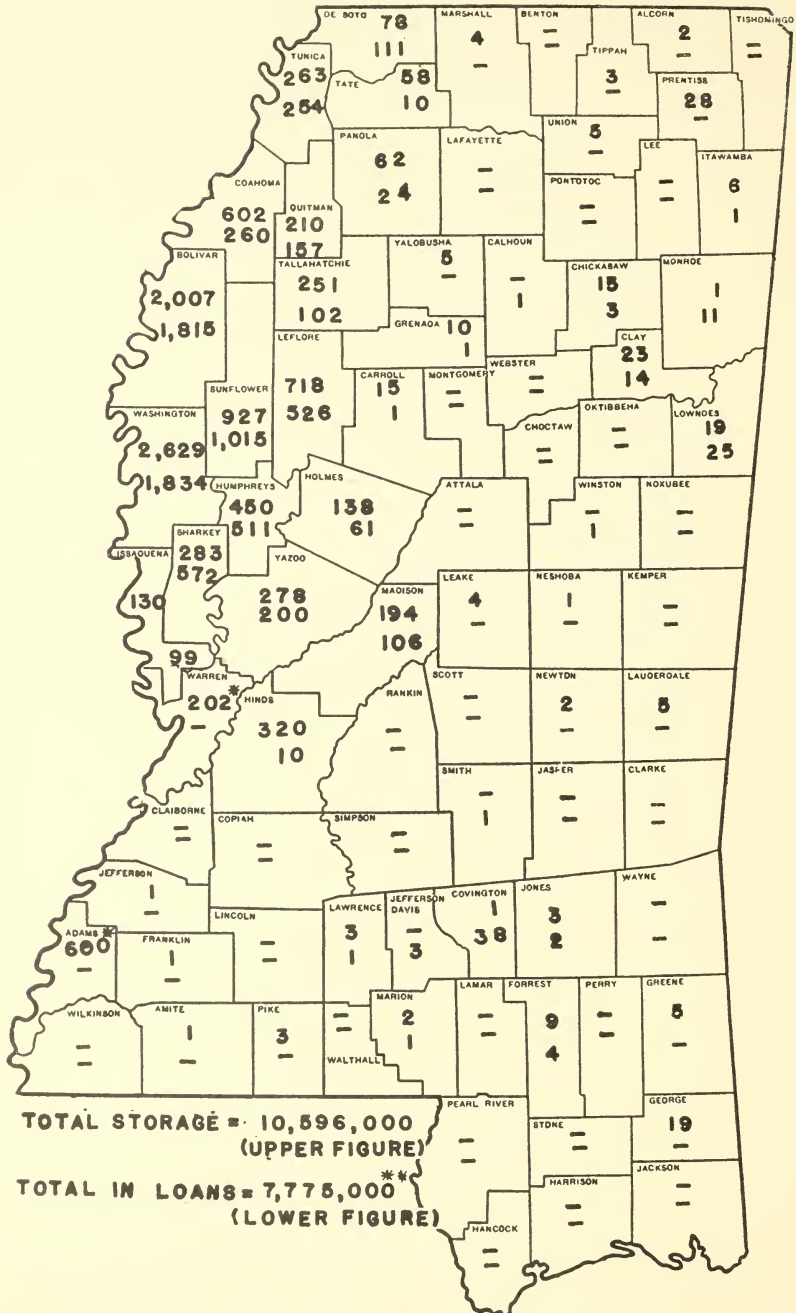


Figure 9. Capacity of commercial and farm storage facilities, and quantity of corn, oats, wheat, barley, rice, and soybeans stored for CCC loans in Mississippi, 1954.

*Includes 797,000 bushels of terminal and sub-terminal elevators.

**Grain in loan as of January 15, 1955. Data from the files of the Mississippi ASC State Office.

market probably because they considered any price near or above the loan rate as acceptable. Also many of the farmers probably sold their soybeans at harvest, when the price was near that of the loan, because they needed the receipts for operating purposes.

Still another obstacle has often developed in commercial storage. Sometimes the previous year's crop has not been moved out by the CCC in time to store grain produced in the current year, or the old crop has had to be shipped at the same time the new crop was coming into storage.

As far as commercial facilities have been concerned, Figure 9 may be a bit deceiving because grain stored in such facilities often crosses county lines, but farmers receive their loans from the county in which the grain was produced. This helps to account for the over-balance of facilities in some counties and under-balance in others.

Another factor which has caused complications in Figure 9 has been that there was no way to determine how many of the farm facilities purchased through government loans were actually used to store grain for loans. In many instances in the Upland areas of the state, there are indications that these facilities were not used at all. The major difficulty of determining the adequacy of storage facilities, however, has been the inability to measure the capacity of other types of farm storage.

Figure 9 shows the volume of the grains going into the loan and the capacity of most of the eligible storage facilities. What has not been determined is how much more grain would have gone into the loan had facilities been available, or how much of the grain which went into the loan would have gone into the cash market had adequate marketing facilities been available to have offered a more enticing price.

Operating Policies of Elevators

Operating policies have been mentioned briefly under various other headings. These policies should at least be mentioned in rather general terms to illustrate some of the attempts by elevator managers and farmers to be

assured of a stable storage program.

A discussion of operating policies requires the same classification of facilities as developed under ownership - cooperatives and privately-owned businesses or corporations. Even in this division of storage facilities, policies have not been very distinct for each type of ownership.

Cooperatives. Practically all of the cooperatives have used some system of allocation of storage capacity. Usually this has been on the basis of so many bushels of storage per share of stock. If the rate of storage per share were low enough so that the entire capacity were not allocated, the remainder has been available for use by non-member farmers.

About half of the cooperatives have been holding the farmers responsible for their allocated capacity. If the farmers do not release their excess capacity by a certain date, they have been charged a certain prearranged fee per bushel of capacity not used.

The idea of handling any farmer's grain was tried but failed when more grain was produced in the immediate area than the elevator was able to handle. One elevator received grain from all farmers in the area with the agreement that the management would have the authority to sell all of the small grains in time to store soybeans. The elevator disposed of the non-stockholder's grain first under this arrangement. This allowed more time to find better markets for the stockholders' grains and also to hold the small grains long enough to determine if more income could be made by continuing to hold the small grains instead of soybeans.

Privately-owned businesses and corporations. Usually the elevators, other than cooperatives, have not been interested in whose grain they have stored. However, some have agreed to store so many bushels or a certain percent of a farmer's grain crop. Indications were that in certain cases there has been an understanding that the farmer would sell the remainder of the crop to the elevator. Such understandings have usually been stated in the form that the elevators would buy the re-

remainder of the crop, rather than that the farmer must sell to the elevator. An arrangement, such as this, could prove very profitable to an elevator in the event the remainder of the crop were purchased at the seasonal low price being paid in the local area, rather than the one quoted in the commodity exchanges. Naturally, to what extent, if at all, such practices have been in operation, could not be determined. Indications were that the practice was not followed now to the extent it once was, probably because farmers were more aware of the effect of such practices.

One rice elevator made contracts with farmers for a five-year period, in order to assure them of a certain percent of the elevator's capacity. The farmers have contracted for an equivalent of 50 bushels of rice per acre for an established number of acres. This type of arrangement has assured both the producers and elevator owners of a stable operation. In this case, farmers have been held responsible for the amount of storage capacity contracted and have paid for the unused capacity at the same rate as that utilized.

One corporation owned by a group of farmers has operated much as a cooperative. This elevator has been allocating its capacity on the basis of

so many bushels per dollar of stock. By operating the business in this manner, the earnings have been divided among the stockholders on the basis of stock held. Since storage capacity has also been allocated on the same basis, dividends, in a sense, have been equivalent to patronage refunds from a cooperative. Also the stockholders have received the income realized from storing grain for non-stockholders.

One soybean elevator was a corporation of six or eight farmers who erected their own storage and crushing facilities. The elevator had not been under a storage agreement but had been eligible for a contract in the event the farmers did not produce enough to use it to capacity. Without a storage agreement, loans on soybeans have been classified as on-the-farm.

Under both types of ownership, cooperative and privately-owned or corporation, basically the same problems have been involved. To be of greatest value, elevators must be used to near their capacity every season. Farmers must be assured of storage and marketing facilities in order to produce a commodity. The elevator operators have attempted to assure both themselves and the grain producers of a stable grain storage program by some of the various means mentioned above.

SUMMARY AND CONCLUSIONS

The pattern of agricultural production in Mississippi has been undergoing a change within recent years. Though cotton still maintains its place as the state's leading source of agricultural income, its position is being challenged by increases in receipts from other farm sources. Part of this gain is accounted for by expanded receipts from the sale of livestock and livestock products. The grain crops—oats, wheat, barley, corn, rice and soybeans—have also been accounting for a higher proportion of the total cash farm income.

If grain production is to continue to expand in Mississippi, marketing and storage facilities must keep pace. An analysis of seasonal prices for the grains indicates that this has not been the

case. The common occurrence of a price slump at harvest signifies that marketing and storage facilities for grain in Mississippi have been inadequate.

This study was made to determine the adequacy of such facilities. Its objectives were to determine the present needs for marketing and storage facilities, and to project probable future needs. In addition to a survey of existing facilities, the work included a study of grain production and utilization, over time, to determine the trend in the supply of feed and in the amount needed for feed.

Oat, barley, and soybean production have been increasing rather rapidly in Mississippi. Corn production has tend-

ed to become stabilized even though in most recent years there has been a deficit supply. With wider use of improved cultural practices and limited irrigation, corn production may be expected to increase, provided adequate marketing and storage facilities become available. Expansion of rice production has been retarded at present by acreage restrictions. Removal, or modification, of these restrictions would, in all probability, mean rapid expansion in the production of this crop. Wheat production is in somewhat the same position as rice. With indications, even under existing conditions, of needs for additional marketing facilities to handle the increasing supply of commercial grains, the relaxing of rigid production controls would push these needs even higher.

Mississippi's large livestock and poultry inventories indicate that more grains will be needed for feeds. Broiler production has made rapid gains in the State since 1950, requiring an abundance of shelled, yellow corn. Cattle and sheep numbers have been increasing steadily in recent years and, especially in the case of dairy cattle, have required more of the feed grains. Hog numbers began an up-turn in 1955, after declining for several years. This has added to the feed grain needs, particularly corn. Horse and mule numbers have been decreasing steadily, and this trend may be expected to continue. Since a large portion of the oats produced in the Delta has been used as feed for workstock, the decline in workstock inventories will release more of the grain for the market. While an expanded livestock program will call for more feed grains, production of some of the grains may increase faster than the feed requirements for livestock.

There are usually appreciable differences in grain prices at harvest and at other seasons of the year. During the period 1947-54, the seasonal price spread for soybeans averaged 76 cents per bushel. The average seasonal price spread per bushel for oats was 18 cents; for corn, 27 cents; and for wheat, 23 cents. Price peaks for most grains

normally occur within nine months after harvest. Commercial storage and handling charges per bushel for nine months, based on 1954 rates, were 22 cents for soybeans; 12 cents for oats, 17 cents for corn; and 22 cents for wheat. Although storage charges for years other than 1954 were not ascertained, these differences between peak prices and charges would imply that, provided storage charges maintained approximately the same relationship to prices throughout the period, grain producers could have netted additional profits through storage operations. The difference between the eight-year average seasonal price spread and commercial storage charges for nine months was 54 cents for soybeans, 6 cents for oats, 10 cents for corn and 1 cent for wheat. At Booneville, where storage charges were made on a twelve-month basis, there were still greater differences between seasonal price spreads and storage charges. Here these differences were: for soybeans, 67 cents; for oats, 9 cents; for corn, 18 cents; and for wheat, 14 cents.

Storage facilities approved for CCC-loan grain in Mississippi may be classified as commercial elevators and on-the-farm facilities. Basis for classification was the type of government loan received on the stored grain, rather than the type or location of the structure. CCC-approved commercial elevator storage capacity in the state was approximately 4.71 million bushels at the end of 1954. This included capacities of 181,000 bushels in elevators with handling agreements only, 797,000 bushels in terminal and sub-terminal elevators, and 847,000 in structures suitable for handling sacked rice only. Of the remaining 2.9 million bushels of approved capacity, only 80 to 90 percent could be considered effective storage capacity, due to operating methods which require excess turn-over space.

No definite quantitative measure of on-the-farm storage potential could be made. The policy of ASC county committee approval of facilities for this purpose has resulted in wide variations of specifications for approved farm storage structures and thus renders this

capacity most difficult to measure. The only accurate measure of farm storage facilities ascertainable was the 5,865,257-bushel capacity of structures purchased through government loans, and a commercial bin capacity of 19,000 bushels.

Total storage capacity, including both commercial and measurable on-the-farm facilities, was approximately 10,596,000 bushels in 1954. By January 15, 1955, approximately 7,775,000 bushels of grain, or about 14 percent of Mississippi's 1954 grain crops, had been stored under government loans. The existence of an unused approved storage capacity of nearly three million bushels did not, however, necessarily mean that effective capacity was ample. Less than half of the 4.71 million-bushel capacity in commercial elevators was effective storage capacity. Not all of the farm facilities purchased through government loans were used. Many of the storage facilities have had very limited use due to their location in areas distant from commercial grain production areas. A market price for oats at harvest averaging 21 cents below the loan rate in 1954 is evidence of the extent of inadequate facilities.

The center of concentration of storage facilities has been around Washington County in the Delta and has spread out toward the Brown Loam Area. Large numbers of on-the-farm storage facilities are in counties having few or no elevators. The Delta and Brown Loam counties have been the major commercial grain areas, followed by those in the Northeast Prairie. No organized

outlet for cash grain has been developed in the Northeast Prairie except through CCC loans for farm-stored grains.

Shortages of storage space were found not only for commercial grain, but also for grain for farm use. More substantial storage structures are needed for farm feed grains to permit effective insect and rodent control

Grain production will probably become a more important part of Mississippi's agricultural pattern, along with the various livestock enterprises. High cotton yields in the West can be expected to exert pressure on cotton producers in Mississippi, forcing them to turn to other sources of cash income. If this expansion is to take place, elevators must be erected at which producers may receive either an equitable price or a bonded warehouse receipt for their grains.

Most farmers must have cash for their crops soon after harvest to cover operating expenses. The development of an adequate marketing system in the state would facilitate the securing of loans on stored grains, while at the same time making it possible for more producers to retain equity in the grain for sale at a higher seasonal price. Facilities which would perform these functions are needed over most of the commercial grain area of Mississippi. As the demand for facilities increases, investment opportunities in the construction of elevators should be attractive to both farmer cooperatives and individuals.

APPENDIX

Table 1. Five-year moving averages of farm cash receipts of Mississippi farmers expressed in percentages from 1924-53.

	1924-1928	1925-1929	1926-1930	1927-1931	1928-1932	1929-1933	1930-1934	1931-1935	1932-1936	1933-1937	1934-1938	1935-1939	1940-1944
Farm products	4.4	4.8	5.9	7.1	8.2	8.7	8.9	8.6	7.5	6.9	6.7	6.9	7.2
Dairy products	2.9	3.1	3.4	3.5	3.7	3.7	3.7	3.6	4.5	4.4	5.0	5.8	6.1
Cattle, calves	1.8	1.7	1.9	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.5	2.8	3.0
Hogs	2.6	2.6	2.9	2.6	3.0	2.8	2.7	2.7	2.3	2.3	2.5	2.6	2.7
Eggs	1.1	1.2	1.4	1.6	1.7	1.8	1.8	1.7	1.4	1.3	1.2	1.5	1.9
Poultry	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Other													
Total livestock and products	13.1	13.6	15.7	17.4	18.9	19.4	19.5	19.9	17.9	17.4	18.0	19.7	21.0
Field crops:													
Cotton lint	69.0	68.6	66.2	65.0	62.4	61.7	61.0	59.9	61.4	62.5	61.5	60.2	59.2
Cottonseed	8.4	8.0	8.2	8.4	8.2	7.9	8.1	8.5	10.0	10.6	11.2	10.8	10.3
Grain crops	0.5	0.2	0.5	0.1	0.5	0.5	0.5	0.6	0.6	0.6	0.8	0.9	1.1
Soybeans	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3
Tobacco crops	3.7	3.3	3.3	3.0	3.4	3.4	3.4	3.5	3.2	2.6	2.2	2.2	2.0
Other	1.9	1.9	2.1	2.4	2.9	3.3	3.6	3.9	3.7	3.3	3.2	3.0	2.9
Fruit and tree nuts	1.0	0.9	0.9	1.1	1.1	1.2	1.2	0.9	0.9	0.9	0.9	0.9	0.8
Forest, greenhouse, nursery	2.3	2.1	2.1	2.2	2.4	2.5	2.5	2.4	2.1	1.9	1.9	2.0	2.4
Total crops	86.9	86.4	84.3	82.6	81.1	80.6	80.5	80.1	82.1	82.6	82.0	80.3	79.0
Total crops and livestock	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Continued)

Table 1. Five-year moving averages of farm cash receipts of Mississippi farmers expressed in percentages from 1924-53.—(Continued)

Farm products	1937-	1938-	1939-	1940-	1941-	1942-	1943-	1944-	1945-	1946-	1947-	1948-	1949-	1950-	1951-	1948-	1949-		
	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1952	1953		
Dairy products	7.3	7.1	6.9	6.6	6.2	6.8	6.8	6.9	6.9	6.9	7.3	7.6	7.6	7.6	7.6	7.6	7.6	7.6	
Cattle, calves	6.5	6.6	6.5	6.1	5.9	7.0	7.6	8.4	8.9	9.3	8.5	8.7	8.7	8.5	8.5	8.7	8.7	8.7	7.9
Hogs	3.0	3.1	3.3	3.4	3.4	3.7	3.9	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.6
Eggs	2.7	2.8	2.9	3.1	3.2	3.5	3.5	3.1	3.0	2.8	2.7	2.8	2.8	2.8	2.7	2.8	2.8	2.8	3.0
Poultry	2.1	2.2	2.6	2.7	2.9	3.2	3.2	3.1	3.1	3.1	3.3	3.2	3.1	3.1	3.3	3.2	3.1	3.3	4.2
Other	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total livestock and products	21.7	21.9	22.3	22.0	21.7	24.4	25.2	25.5	25.9	26.1	25.8	27.0	27.0	26.1	25.8	27.0	27.0	26.6	26.6
Field crops:																			
Cotton lint	58.5	58.2	57.9	58.2	58.7	55.8	55.3	55.2	56.1	56.0	57.5	56.2	57.2	56.0	57.5	56.2	57.2	57.2	57.2
Cottonseed	10.1	10.4	10.3	10.7	10.5	9.6	9.0	8.8	7.9	7.7	7.4	7.3	7.3	7.0	7.4	7.3	7.3	7.3	6.7
Grain crops	1.3	1.4	1.3	1.5	1.6	1.9	2.0	2.1	2.0	2.0	1.8	1.8	2.0	2.0	1.8	1.8	2.0	2.0	2.0
Soybeans	0.3	0.5	0.6	0.6	0.6	0.7	0.6	0.6	0.6	1.2	1.5	2.0	2.0	1.2	1.5	2.0	2.0	2.0	0.8
Truck crops	1.9	1.6	1.6	1.5	1.4	1.5	1.6	1.4	1.4	1.2	1.0	1.0	1.0	1.2	1.0	1.0	1.0	1.0	0.8
Other	2.8	2.8	2.8	2.7	2.8	3.4	3.3	3.2	3.0	2.7	2.0	1.8	1.9	2.7	2.0	1.8	1.9	1.9	1.9
Fruit and tree nuts	0.9	0.8	0.8	0.8	1.0	1.0	1.0	1.0	0.9	0.6	0.5	0.5	0.4	0.6	0.5	0.5	0.5	0.4	0.4
Forest, greenhouse, nursery	2.5	2.4	2.2	2.0	1.7	1.7	2.0	2.2	2.2	2.5	2.5	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4
Total crops	78.3	78.1	77.7	78.0	78.3	75.6	74.8	74.5	74.1	73.9	74.2	73.0	73.4	73.9	74.2	73.0	73.4	73.4	73.4
Total crops and livestock	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Cash Receipts From Farming, By States and Commodities, Calendar Years 1924-44, Washington, D. C., 1946; The Farm Income Situation, United States Department of Agriculture, Agricultural Marketing Service, Washington, D. C., 1945-54.

Table 2. Farm cash receipts of Mississippi farmers, 1924-53.

Farm products	1924	1925	1926	1927	1928	1929	1930	1931
	1,000 dollars							
Dairy products	7,021	7,380	9,001	10,442	12,186	13,455	12,095	9,304
Cattle, calves	4,923	5,336	5,949	6,831	7,516	7,851	5,086	3,438
Hogs	3,523	3,239	2,995	4,823	4,332	3,352	3,081	2,009
Eggs	4,394	4,991	5,940	5,529	5,848	5,737	4,641	2,771
Poultry	2,098	2,094	2,569	2,760	2,616	2,396	2,949	1,899
Other	520	553	576	582	532	308	315	191
Total livestock and products	22,479	23,593	27,030	30,967	33,030	33,599	28,167	19,612
Field crops:								
Cotton lint	131,022	201,648	108,060	157,065	143,233	158,431	93,237	45,427
Cottonseed	12,925	20,012	18,201	18,431	18,766	22,474	12,844	5,214
Grain crops	718	957	841	1,038	861	605	471	460
Soybeans	150	482	399	172	295	189	137	102
Truck crops	7,937	7,957	8,402	8,344	5,285	5,932	3,996	2,783
Other	3,250	4,034	3,895	4,240	4,211	4,699	3,411	2,987
Fruit and tree nuts	1,766	2,524	2,159	1,469	2,424	1,358	1,677	1,745
Forest, greenhouse, nursery	5,408	5,128	4,981	4,384	4,280	4,148	3,187	2,370
Total crops	163,176	242,742	146,938	195,143	179,355	197,836	118,960	61,038
Total crops and livestock	185,655	266,335	173,968	226,110	212,385	231,435	147,127	80,700

Farm products	1932	1933	1934	1935	1936	1937	1938	1939
	1,000 dollars							
Dairy products	7,120	7,094	8,110	9,387	10,750	11,713	10,891	9,676
Cattle, calves	2,983	2,848	3,951	9,379	6,856	8,082	9,344	9,655
Hogs	1,474	1,993	2,493	3,401	3,753	4,390	4,592	4,690
Eggs	2,155	1,912	2,358	3,601	3,885	4,240	4,850	3,366
Poultry	1,465	1,415	1,250	1,609	2,009	2,598	1,962	3,180
Other	169	191	201	170	189	247	143	114
Total livestock and products	15,366	15,453	18,363	27,547	27,442	31,270	31,782	30,681
Field crops:								
Cotton lint	40,940	54,715	81,476	75,352	120,628	104,830	87,940	78,843
Cottonseed	5,297	5,766	14,094	14,213	26,444	17,233	14,882	11,923
Grain crops	567	396	714	923	1,000	1,394	2,631	1,418
Soybeans	142	75	142	276	522	705	414	404
Truck crops	4,071	3,396	2,369	3,456	3,867	4,441	2,907	2,522
Other	3,506	3,141	4,668	4,869	4,660	4,872	4,602	4,297
Fruit and tree nuts	578	1,008	1,205	1,186	1,383	1,139	1,371	1,495
Forest, greenhouse, nursery	2,075	2,155	2,176	2,262	3,252	3,440	3,194	3,384
Total crops	57,176	70,652	106,846	102,537	161,756	138,054	117,941	104,286
Total crops and livestock	72,542	86,105	125,209	130,084	189,198	169,324	149,723	134,967

Farm products	1940	1941	1942	1943	1944	1945	1946	1947
	1,000 dollars							
Dairy products	9,506	12,490	15,783	19,667	22,394	23,332	26,989	30,301
Cattle, calves	9,075	11,357	14,257	19,055	18,530	26,152	32,894	41,964
Hogs	3,890	3,739	8,512	14,610	13,215	12,178	11,402	19,890
Eggs	3,359	4,638	7,388	12,548	11,918	12,175	11,632	12,608
Poultry	3,194	3,827	6,008	11,008	10,576	12,625	11,567	10,563
Other	135	154	190	288	346	755	1,224	1,340
Total livestock and products	29,159	36,205	52,138	77,176	76,979	87,217	95,708	116,671
Field crops:								
Cotton lint	55,789	121,855	161,155	190,393	215,953	183,023	140,681	281,082
Cottonseed	9,161	25,894	31,718	34,242	34,846	26,305	25,334	42,329
Grain crops	1,408	2,996	3,441	4,707	6,216	6,600	9,112	9,163
Soybeans	305	410	3,088	3,440	1,560	1,539	1,964	3,103
Truck crops	1,817	2,397	3,724	5,839	4,703	4,760	5,521	7,281
Other	3,082	4,268	7,211	9,358	10,202	11,679	15,052	12,417
Fruit and tree nuts	766	1,846	1,733	2,356	4,024	4,678	3,515	2,868
Forest, greenhouse, nursery	3,585	5,102	3,716	4,019	4,984	5,890	8,503	14,289
Total crops	75,913	164,768	215,786	254,354	282,488	244,474	209,682	372,532
Total crops and livestock	105,072	200,973	267,924	331,530	359,467	331,691	305,390	489,203

(Continued)

Table 2. Farm cash receipts of Mississippi farmers, 1924-53.—(Continued)

Farm products	1948	1949	1950	1951	1952	1953
			1,000 dollars			
Dairy products	34,429	29,157	33,649	60,067	42,100	44,628
Cattle, calves	50,703	37,695	47,759	38,314	52,150	37,597
Hogs	19,543	16,683	18,080	20,188	22,273	19,602
Eggs	12,284	12,456	14,933	17,470	16,304	20,145
Poultry	14,996	15,913	18,265	25,020	28,319	28,852
Other	1,695	2,050	1,559	1,696	1,603	1,617
Total livestock and products	133,650	113,954	134,245	162,755	162,749	152,441
Field crops:						
Cotton lint	309,557	315,024	266,756	293,471	280,452	413,887
Cottonseed	51,236	26,424	33,268	36,898	44,951	40,533
Grain crops	9,109	6,726	9,180	10,758	12,566	15,810
Soybeans	4,387	2,978	15,812	12,101	16,235	7,780
Truck crops	5,844	5,099	3,916	4,116	6,850	—
Other	11,152	9,329	8,809	8,445	9,603	15,385
Fruit and tree nuts	3,397	2,522	1,198	2,921	2,322	3,233
Forest, greenhouse, nursery	10,029	8,180	15,538	14,967	14,033	13,246
Total crops	404,711	376,282	354,477	383,677	387,012	509,874
Total crops and livestock	538,361	490,236	488,722	546,432	549,761	662,315

Source: Cash Receipts From Farming, By States and Commodities, Calendar years 1924-44, Washington, D. C., 1946; The Farm Income Situation, United States Department of Agriculture, Agricultural Marketing Service, Washington, D. C., 1945-54.

Table 3. Five-year moving averages of corn acreage, yield, and production in Mississippi, 1920-54.

Five-year moving averages	Corn			Five-year moving averages	Corn		
	Acres harvested (1000)	Yield Bu./A.	Production (1000 bu.)		Acres harvested (1000)	Yield Bu./A.	Production (1000 bu.)
1920-24	2,673	15.6	42,400	1936-40	2,781	14.9	42,578
1921-25	2,514	16.0	40,653	1937-41	2,839	15.4	44,915
1922-26	2,263	16.2	36,599	1938-42	2,899	15.3	45,679
1923-27	2,076	16.3	33,435	1939-43	2,843	15.2	44,505
1924-28	1,964	16.2	31,628	1940-44	2,803	15.9	45,853
1925-29	1,915	17.3	33,333	1941-45	2,757	17.1	46,953
1926-30	1,920	16.0	30,809	1942-46	2,596	17.0	43,995
1927-31	1,996	15.9	31,950	1943-47	2,468	16.9	41,594
1928-32	2,095	15.0	31,640	1944-48	2,353	18.6	43,601
1929-33	2,220	15.2	33,868	1945-49	2,240	20.0	44,701
1930-34	2,370	14.6	34,816	1946-50	2,198	20.7	45,410
1931-35	2,509	15.0	37,490	1947-51	2,110	21.7	45,745
1932-36	2,595	14.2	36,897	1948-52	2,004	21.6	43,814
1933-37	2,631	15.0	39,455	1949-53	1,857	21.2	39,692
1934-38	2,770	15.2	42,160	1950-54	1,762	20.0	35,596
1935-39	2,788	14.8	41,234				

Source: Yearbook of Agriculture, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1920-35; Agricultural Statistics, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1936-53; Crop Production—1954 Annual Summary, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., December, 1954.

Table 4. Five-year moving averages of oat acreage, yield, and production in Mississippi, 1920-54.

Five-year moving averages	Oats			Five-year moving averages	Oats		
	Acres harvested (1000)	Yield Bu./A.	Production (1000 bu.)		Acres harvested (1000)	Yield Bu./A.	Production (1000 bu.)
1920-24	128	18.2	2,379	1936-40	91	30.1	2,831
1921-25	119	18.6	2,267	1937-41	138	32.1	4,602
1922-26	98	19.0	1,859	1938-42	187	32.5	6,116
1923-27	82	19.2	1,567	1939-43	235	32.8	7,563
1924-28	64	20.4	1,211	1940-44	301	33.0	10,035
1925-29	47	20.2	936	1941-45	354	32.8	11,622
1926-30	34	21.1	685	1942-46	370	31.8	11,824
1927-31	36	20.5	769	1943-47	393	31.8	12,520
1928-32	32	19.7	689	1944-48	399	32.4	12,917
1929-33	31	19.5	653	1945-49	363	31.1	11,277
1930-34	31	19.9	633	1946-50	301	29.9	9,164
1931-35	33	19.8	681	1947-51	252	29.5	7,599
1932-36	33	22.2	876	1948-52	203	30.9	6,392
1933-37	37	24.7	859	1949-53	189	32.3	6,277
1934-38	45	27.7	1,146	1950-54	230	34.2	8,315
1935-39	54	27.7	1,563				

Source: Yearbook of Agriculture, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1920-35; Agricultural Statistics, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1936-53; Crop Production—1954 Annual Summary, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., December, 1954.

Table 5. Five-year moving averages of soybean acreage, yield and production in Mississippi, 1927-54.

Five-year moving averages	Soybeans			Five-year moving averages	Soybeans		
	Acres harvested (1000)	Yield Bu./A.	Pro-duction (1000 bu.)		Acres harvested (1000)	Yield Bu./A.	Pro-duction (1000 bu.)
1927-31	12	10.3	125	1939-43	105	11.1	1,266
1928-32	11	11.2	127	1940-44	109	11.8	1,366
1929-33	10	12.0	122	1941-45	114	12.4	1,450
1930-34	9	12.5	119	1942-46	114	13.3	1,510
1931-35	12	13.1	154	1943-47	92	13.3	1,208
1932-36	23	11.5	210	1944-48	90	14.5	1,346
1933-37	31	11.0	272	1945-49	94	15.3	1,472
1934-38	41	9.9	348	1946-50	149	17.7	3,101
1935-39	53	9.2	452	1947-51	224	17.3	3,996
1936-40	57	8.6	484	1948-52	296	17.2	4,959
1937-41	57	9.3	532	1949-53	319	16.0	5,060
1938-42	88	10.4	1,020	1950-54	401	14.6	5,709

Source: **Yearbook of Agriculture**, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1928-35; **Agricultural Statistics**, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1936-53; **Crop Production—1954 Annual Summary**, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., December, 1954.

Table 6. Five-year moving averages of wheat acreage, yield and production in Mississippi, 1941-54.

Five-year moving averages	Wheat			Five-year moving averages	Wheat		
	Acres harvested (1000)	Yield Bu./A.	Pro-duction (1000 bu.)		Acres harvested (1000)	Yield Bu./A.	Pro-duction (1000 bu.)
1941-45	12	24.6	298	1946-50	12	21.8	270
1942-46	12	23.6	279	1947-51	11	22.4	245
1943-47	15	23.6	338	1948-52	9	23.0	200
1944-48	16	22.4	355	1949-53	15	23.9	377
1945-49	15	22.0	322	1950-54	18	25.1	481

Source: **Agricultural Statistics**, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1943-53; **Crop Production—1954 Annual Summary**, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., December, 1954.

Table 7. Rice acreage, yield, and production in Mississippi, 1949-54.

Year	Rice		
	Acreage harvested	Yields, bushel per acre	Production (bushels)
1949	5,000	60.0	300,000
1950	7,000	60.0	420,000
1951	27,000	54.4	1,471,100
1952	48,000	51.7	2,480,000
1953	53,000	54.4	2,884,444
1954	82,000	60.0	4,920,000

Source: **Agricultural Statistics**, United States Department of Agriculture, United States Government Printing Office, Washington, D. C., 1951-53; **Crop Production—1954 Annual Summary**, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., December, 1954.

Table 8. Supply and utilization of corn by the various livestock enterprises in Mississippi, 1950 and 1954.

Livestock enterprise	1950			1954		
	Fed as corn	Corn in formula feed	Total corn fed	Fed as corn	Corn in formula feed	Total corn fed
	1,000 bushels					
Dairy	5,356	712	6,068	6,136	817	6,953
Beef	500	—	500	643	—	643
Sheep	36	—	36	50	—	50
Hogs	15,070	71	15,141	9,213	44	9,257
Poultry	7,499	3,431	10,930	7,499	4,948	12,447
Horses and mules	11,356	214	11,570	8,725	165	8,890
Other livestock	643	357	1,000	643	357	1,000
Total for livestock	40,460	4,785	45,245	32,909	6,331	39,240
Uses other than livestock feed			3,321			3,321
TOTAL UTILIZATION			48,566			42,561
Production from previous year			41,995			32,934
Difference between production and utilization			6,571			9,627
Status of stocks during year*			-2,216			+ 233
Deficit coming from out-of-state			4,355			9,860

Source: Jennings, R. D., **Feed Consumed by Livestock, Supply and Disposition of Feed, 1949-50**, United States Department of Agriculture, Agricultural Research Service, Statistical Bulletin No. 145, Washington, D. C., June, 1954; **Livestock and Poultry on Farm and Ranch**, January 1, United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Washington, D. C., 1951-55; **Crop Production**, United States Department of Agriculture, Agricultural Marketing Service, (Bureau of Agricultural Economics through November, 1953), Washington, D. C., October, 1950, October, 1954, and 1950 and 1954 Annual Summaries.

*October 1 stocks were used for the old crop to prevent combining of two years' production.

Table 9. Seasonal index of monthly prices received by Mississippi farmers for corn, oats, wheat, and soybeans derived from 13-month moving averages, 1947-54.

Crop	Months											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Corn	96.2	98.4	100.3	102.5	104.3	105.1	106.8	105.8	102.9	95.9	90.5	91.1
Oats	104.0	101.0	101.5	104.7	102.7	90.3	89.2	93.7	98.5	103.9	106.5	103.9
Wheat	104.6	102.8	103.9	104.0	103.4	97.9	93.9	93.5	95.8	98.0	99.6	102.6
Soybeans	98.4	100.2	106.8	111.2	111.5	108.1	105.4	99.1	89.2	86.4	89.7	93.7

Source: **Agricultural Prices**, Agricultural Marketing Service (Bureau of Agricultural Economics through October, 1953), Washington, D. C., February, 1947, to January, 1955.