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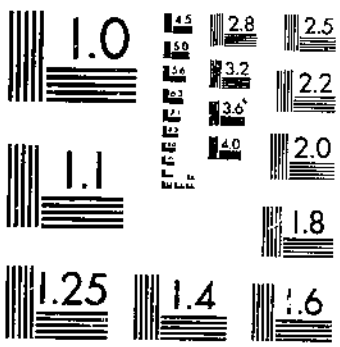


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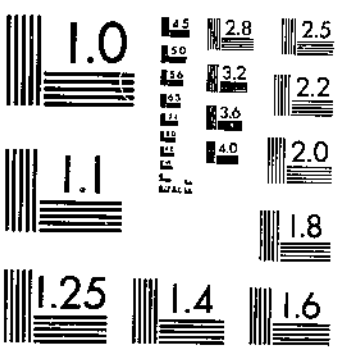


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# PLANTATION ORGANIZATION AND OPERATION IN THE YAZOO-MISSISSIPPI DELTA AREA[1]

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CONTENTS



## INTRODUCTION

The Yazoo-Mississippi Delta area is one of the most highly specialized cotton-producing areas in the world. A large percentage of the land in farms is in large plantations ranging from 400 to several thousand acres, and operated largely with tenants. Changes in

[1] Submitted for publication December 2, 1938.

[2] This study was begun under the leadership of the late C. L. Holmes, of the Bureau of Agricultural Economics, and the late W. E. Ayres, formerly of the Delta Branch Station of the Mississippi Agricultural Experiment Station. Acknowledgment is made of the assistance of Sherman E. Johnson and M. Reese Cooper, of the Bureau of Agricultural Economics, in outlining and criticizing the manuscript. Credit is due H. C. McNamara and other members of the staff of the Delta Experiment Station for their ready cooperation during the analysis of the data. T. L. Moore and Juanita Rivers assisted in the tabulation of the data. The authors thank the planters who furnished the information for this study.

economic conditions during recent years have brought about problems in plantation organization and operation that have affected both owners and tenants. This has made it essential to analyze the problems encountered and adjustments made by farmers in the area to

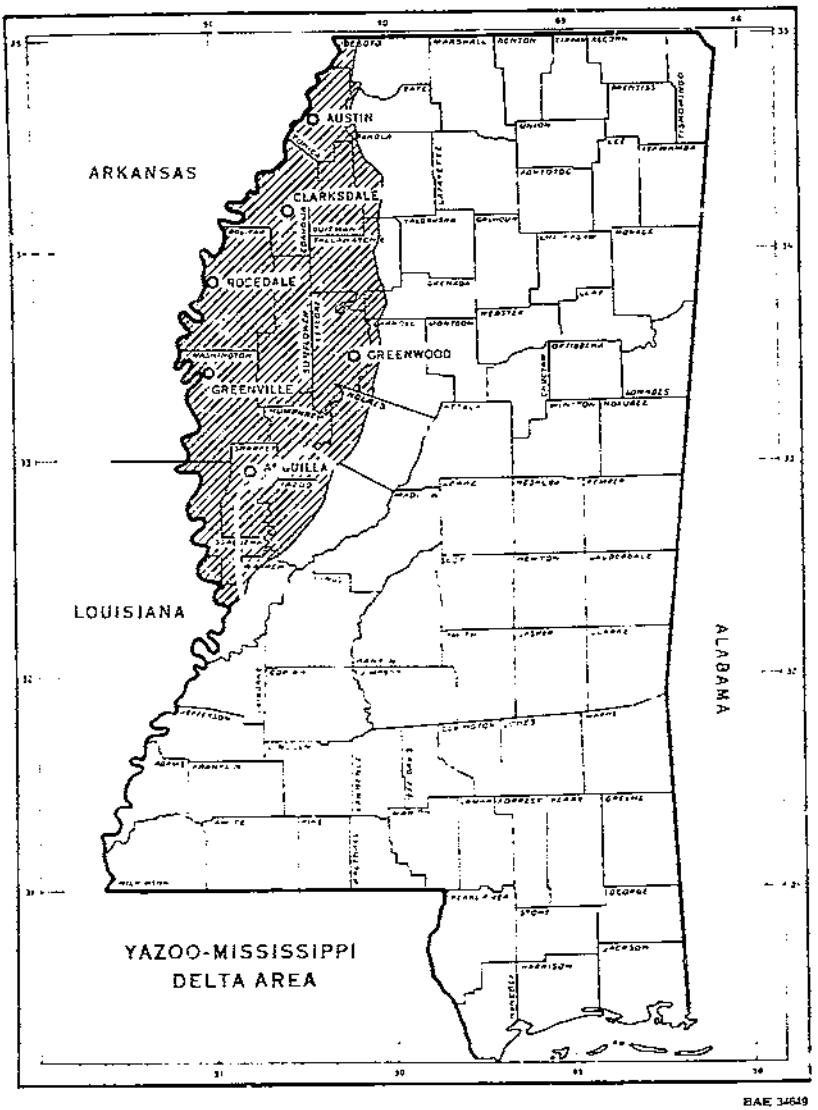


FIGURE 1.—The location and extent of the Yazoo-Mississippi Delta area are indicated by the shading. The circles indicate the location of the weather stations for which data are shown in table 1. These stations are Austin, Clarksdale, Rosedale, Greenwood, Greenville, and Anguilla.

meet changing conditions during recent years, and the relative economic advantages of various adapted systems of plantation organization and operation.

The Yazoo-Mississippi Delta area comprises approximately 4.2 million acres in the northwestern part of Mississippi. It includes all of 10 counties and parts of 9 others. The 10 counties entirely within the area are Bolivar, Coahoma, Humphreys, Issaquena, Leflore, Quitman, Sharkey, Sunflower, Tunica, and Washington. The nine counties partly within the area are De Soto, Tate, Panola, Tallahatchie, Grenada, Carroll, Holmes, Yazoo, and Warren (fig. 1).

The agriculture of this area is characterized by a high specialization in cotton production, by the dominance of the plantation system of farming, and by a high proportion of tenancy. In 1929, before the initiation of governmental cotton-acreage-adjustment programs, 78 percent of the cropland in the 10 counties completely within the area was in cotton. Although small farms are numerous, approximately 69 percent of the farm land in these counties in 1934 was in plantations of 400 acres or more. Of the total farm land in the 10 counties in 1934, 62 percent was operated by tenants. Approximately 87 percent of the tenants that year were colored; practically all of the colored tenants were Negroes.

The successful operation of a cotton plantation requires a high degree of managerial ability in buying and selling, and in organizing, operating, and financing a large agricultural business. The plantation-management problem is further complicated by economic conditions such as prevailed during the past decade. The violent fluctuations in cotton prices from year to year and the low prices of cotton in relation to prices of commodities purchased during that period induced many planters to readjust their systems of plantation organization and operation in an endeavor to maintain earnings at profitable levels.

The readjustments made were primarily in the direction of attempting to reduce production costs. Many planters have turned to the use of wage labor and large-scale machinery in efforts to improve production efficiency and to decrease costs. Tractors have become increasingly numerous as sources of motive power, particularly within the last 15 years, following the development of the all-purpose tractor.

Associated with these relatively recent developments was the old question of diversification as a means of minimizing the income risks incident to a one-crop system of farming. Efforts to substitute other cash enterprises for cotton have not been generally successful, but increased attention has been given to the production rather than the purchase of feed for work stock. Other considerations relative to efficiency in production have been the questions of soil fertility and of the most economical means of maintaining or increasing yields.

### PURPOSE OF STUDY

This study was conducted to determine the nature of plantation-management problems, and to provide information that should be helpful in planning desirable production systems. It is undertaken, in this bulletin, to describe the situation as to the organization, operation, and earnings of representative plantations in the area during the 5-year period 1932–36, and to account for the major causes of differences in plantation earnings during that period; to examine certain aspects of the tenancy and labor situation on plantations; to present information on the labor, power, materials, and other items used in connection

with different production methods; and lastly, to analyze the relative economic advantages of various adapted systems of plantation organization in the area. Throughout this bulletin, the major emphasis is on the economic aspects of plantation management, and only incidental consideration is given to sociological factors.

### METHOD OF STUDY

The data for this study were collected during the 5-year period 1932–36, from an average of 24 plantations located in Coahoma, Bolivar, Sunflower, Washington, Sharkey, Humphreys, and Leflore Counties. These plantations were selected with the assistance of county agricultural agents, and are well representative of conditions in the area generally. Each plantation studied represents a management unit, and not necessarily all of the land owned or operated by an individual planter cooperating in this study. In the cases in which one person operated two or more plantations entirely separate as to headquarters, each management unit was considered as one plantation.

Information on the financial aspects of the plantation business was taken directly from plantation accounts in the course of frequent visits during each year. This financial information included detailed inventories, at the beginning and end of each year, of land and improvements, equipment, feed, seed, and livestock; plantation receipts and expenses; and tenant transactions, involving consideration of the credit advances made to tenants and of the tenants' shares of crops produced. The accounts for each year pertained to the 12 months beginning January 1. Approximately one-third of the cooperating planters kept accounts on special forms furnished for the purpose. The accounts kept by other cooperators were sufficiently similar to provide for uniformity in the data obtained on different plantations.

The financial data for each plantation were supplemented with information pertaining to details of land and livestock organization, crop yields, crop-production practices, livestock feeding, power costs, labor perquisites and supervision, and other phases of plantation operation not available from the plantation financial accounts. This supplemental information was obtained from the plantation operator or manager in the course of a number of periodical visits spaced at intervals during each year so as to follow closely the production operations performed during the different seasons.

At the end of each year of the study, a preliminary financial statement was prepared for individual cooperators showing summary details of the organization, production, income, and expenses for his plantation as compared with similar data for the other plantations. This bulletin serves to summarize these annual preliminary statements and to analyze the other data that were obtained on plantation organization and operation.

### EXPLANATION OF TERMS

*Plantation.*—In this bulletin, a plantation is regarded as comprising approximately 300 or more acres of cropland and accompanying production resources, with the land in one or in closely adjoining tracts, operated with wage labor or tenants or both, managed as a single

unit in respect to the control of labor and of production, and on which cotton is the major enterprise.[3]

*Plantation operator.*—The person responsible for the management of the plantation.

*Tenant.*—A person who operates rented land. In this bulletin, the term when used alone includes sharecroppers, share tenants, and cash tenants.

*Tenant crops.*—Land operated or crops produced by tenants on a share or cash-rent basis.

*Sharecropper.*—A tenant who usually furnishes all of the labor, and bears one-half of the expenses for fertilizer, poison, and ginning in return for one-half of the crops that he produces. Croppers sometimes cash-rent feed land and the work stock and equipment necessary to work it, bear all expenses of production other than real estate and power expenses on this land, and receive all of the products. Seed for interplanted legumes to be turned under on cash-rented land usually is furnished by the plantation operator. The cropper usually is furnished without charge a house, space for a garden and livestock (principally chickens and hogs), water, and wood for fuel. The sharecropper works under the direction and supervision of the plantation operator. In this area, the sharecropper is sometimes referred to as a "half hand" or "half tenant."

*Share tenant.*—A tenant who usually furnishes all of the labor, power and equipment, and seed, and bears three-fourths of the expenses for fertilizer, poison, and ginning in return for three-fourths of the crops that he produces. In the rarer cases in which the share tenant receives only two-thirds of the corn and other feed crops, he furnishes two-thirds of the fertilizer used on these crops. Share tenants often cash-rent feed land, bear all expenses of production other than real estate expenses on this land, and receive all of the products. The share tenant usually is furnished without charge a house and barn, space for a garden and livestock (principally work stock, chickens, and hogs), water, and wood for fuel. Share tenants on plantations usually are as closely supervised as are sharecroppers. In this area, the share tenant is sometimes referred to as a "fourth tenant."

*Cash tenant.*—A tenant who pays a cash rent for the land that he operates, bears all of the expenses of production other than real estate expenses and receives all of the products. The cash tenant is usually furnished without additional charge a house and barn, space for a garden, a small lot for livestock, water, and wood for fuel. A cash tenant usually does not receive close supervision. In this area, the cash tenant is sometimes referred to as a "cash renter."

*Standing-rent tenant.*—A tenant who rents land on substantially the same basis as a cash tenant, except that rent is paid in the form of a fixed quantity of crops, usually lint cotton, instead of in cash. Such tenants are not common in this area, and none was found on the plantations studied.

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[3] This definition follows closely definitions contained in certain previous reports of studies of plantations, except for the qualification as to crop area and the lack of reference to the number of labor or tenant families per plantation. See the following publications:

BRANNEN, C. O. RELATION OF LAND TENURE TO PLANTATION ORGANIZATION. U. S. Dept. Agr. Bull. 1269, 78 pp., illus. 1924.

UNITED STATES BUREAU OF THE CENSUS. PLANTATION FARMING IN THE UNITED STATES. 40 pp., illus. 1916.

*Number of workers per family.*—This term is used primarily in connection with tenants to indicate the number of persons per family who actually do farm work. The number of workers is not expressed on a man-equivalent basis, and includes persons of both sexes between the ages of 10 and 70 years.

*Man workday.*—The equivalent of 10 hours of labor performed by a man under conditions of average efficiency. Work performed by women and children was reduced to a man-equivalent basis.

*Wage laborer.*—A person who receives cash wages for his labor. Laborers like blacksmiths and hostlers usually receive a weekly or monthly wage. Other laborers receive a daily wage for the days when they work, or are paid on a contract basis per acre hoed or per hundredweight of seed cotton picked. Wage-labor families living on plantations usually are furnished without charge, individual houses and garden plots, water, and wood for fuel. Wage labor may also be performed by tenants at times when they are not occupied with their own crops, or by transient laborers from towns. The latter are employed principally for hoeing and picking cotton. Wage laborers work under close supervision. In this area, wage laborers are usually referred to as "wage hands."

*Wage crops.*—Land operated or crops produced by the plantation operator with the use of wage labor, his family's labor, or both.

*Plantation net income.*—Gross plantation income minus gross plantation expenses. Gross plantation income includes sales of cotton lint and seed (including croppers' and share tenants' shares); the plantation operator's share of other crop sales and of Government benefit payments; charges to tenants for supervision, commissions on sales, and interest on advances; increases in inventories of plantation feed and seed; and appreciation in the value of work stock and machinery other than capital purchases. Gross plantation expenses include the purchase value of the sharecroppers' and share tenants' shares of cotton lint and seed; the plantation operator's share of cash expenses; decreases in plantation inventories of feed and seed; depreciation on plantation work stock, machinery, and buildings; and interest on cash used in production and in furnishing credit to tenants. Thus the term "plantation net income" as used in this report refers to the net income that the plantation operator obtains in payment for his management and for the use of his plantation.

## DESCRIPTION OF AREA

### PHYSICAL CONDITIONS AND NATIVE VEGETATION[4]

#### TOPOGRAPHY, FLOOD HAZARDS, AND DRAINAGE

The Yazoo-Mississippi Delta area is a part of the flood plains of the Mississippi and the Yazoo Rivers. The surface is generally level, and soil erosion is not a problem. The altitude above sea level ranges from approximately 200 feet in the northern part of the area to approximately 85 feet in the southern part. Frequent depressions and

[4] This section is based largely upon information derived from the following sources:

UNITED STATES CONGRESS. LETTER FROM THE SECRETARY OF WAR TRANSMITTING . . . LETTER FROM THE CHIEF OF ENGINEERS . . . SUBMITTING A REPORT . . . ON THE YAZOO RIVER, MISS. U. S. Cong. 73d, 2d sess., H. Doc. 198, 195 pp., illus. 1934.

HUTTON, F. Z., THARP, W. E., KIRK, N. M., HAWKER, H. W., and JONES, E. M. SOIL SURVEY OF COAHOMA COUNTY, MISSISSIPPI. U. S. Bur. Soils Field Oper. 1915, Rept. 17: 973-997, illus. 1919.

LOGAN, WILLIAM N. THE SOILS OF MISSISSIPPI. Miss. Agr. Expt. Sta. Tech. Bull. 7, 84 pp., illus. 1916.

low ridges occur as remnants of former watercourses and from irregular deposits of water-borne soil material, but these generally do not hinder the fullest use of large-scale agricultural machinery on the land in cultivation. (See fig. 2.)

Flood hazards and inadequate drainage are the most important physical production problems in the area generally. The area is now protected from direct floods from the Mississippi River by a levee that extends from the bluffs 20 miles south of Memphis, Tenn., to a point near the outlet of the Yazoo River, approximately 10 miles north of Vicksburg, Miss. However, approximately 768,000 acres of land in the southern part is flooded by backwater from the Mississippi River through the Yazoo River outlet on an average of once in

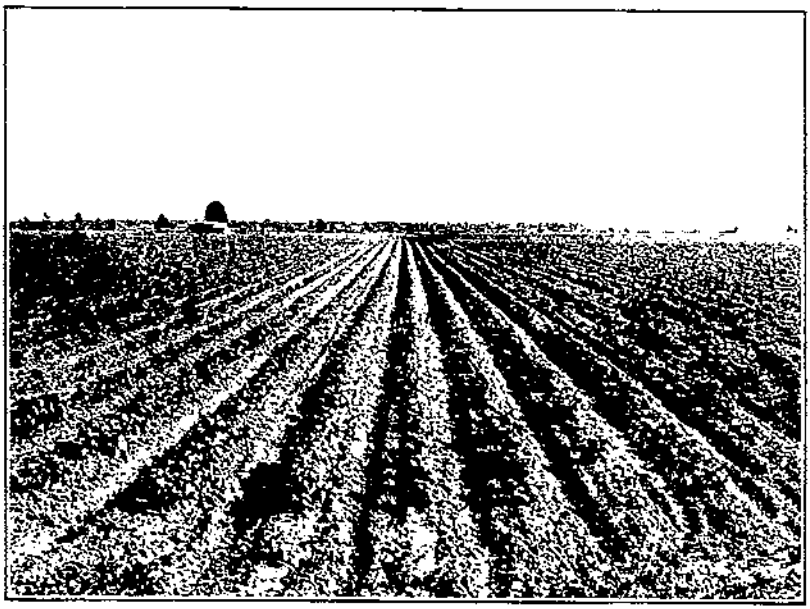

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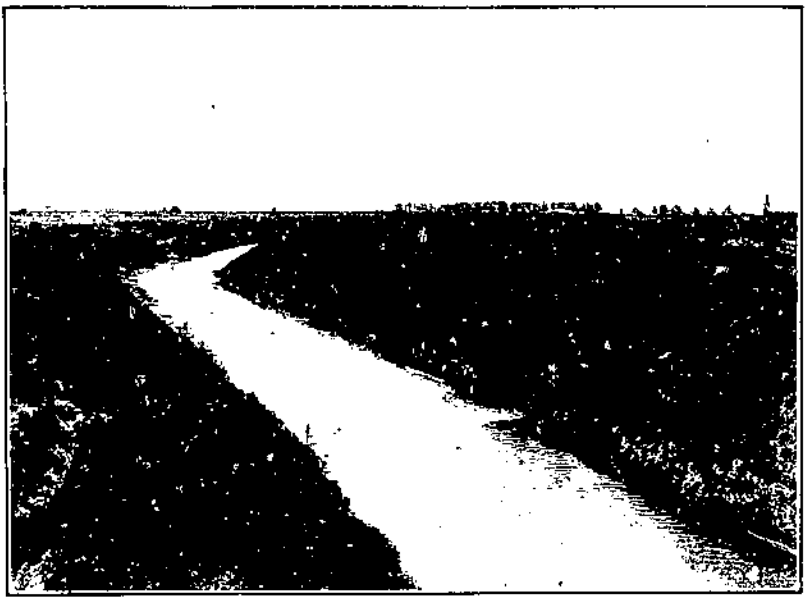
FIGURE 2.—A field of growing cotton in the Yazoo-Mississippi Delta area. The soils of this area generally are deep and naturally fertile, and, when adequately drained, are highly productive. The level topography and large fields permit the fullest use of large-scale machinery.

5 years. Parts of this backwater land are flooded almost every year. Consequently, approximately only 17 percent of this backwater-overflow land was in cultivation in 1930.

In addition to the Mississippi River backwater-overflow area, an estimated 462,000 acres in the eastern part are flooded on an average of once in 6 years from overflows of the Yazoo River and its tributaries. Approximately 45 percent of this direct-overflow land was in cultivation in 1930. It is evident that the further agricultural development of much of this land depends on a successful solution of the overflow and drainage problems.

In 1930, approximately 2,926,000 acres of land in the area were in drainage districts. Many of these districts have been effective in correcting the drainage situation, but in general their operation has

not relieved local flood problems. The expenses incident to the establishment and maintenance of each drainage district are repaid by means of taxes levied against the land within the district. A typical drainage canal is shown in figure 3.



GAE 36143

FIGURE 3.—A drainage canal in the Yazoo-Mississippi Delta area. Because of the level topography and abundant rainfall, drainage is a major production problem. In 1930 approximately 2,926,000 acres of land in this area were in drainage districts.

## SOILS

The soils of the area are derived from the alluvium of fine sand, silt, clay, and organic material deposited by the Mississippi and Yazoo Rivers and their tributaries. These deposits later were modified by subsequent additions of organic material from residues of plant growth. The present soils in the area generally are deep, naturally fertile, and, when adequately drained, are highly productive.

Wide variations exist in the texture of the surface soils and of alternate soil layers as a result of variations in water currents and in the type of sediment carried at times of different overflows. Generally, the highest elevations and the sandier soils are near streams or former watercourse banks, where the largest amounts of sediment and the coarser soil particles were deposited by overflows. With increased distance from the point of overflow, the soils become heavier, marking the deposition of increasingly fine particles by slower water currents, until heavy clays are encountered.

Based on differences in texture, the soils in the area may be classed roughly into two broad divisions—(1) loam soils, containing a high proportion of sand in relation to clay, and (2) the more extensive clay soils, containing a high proportion of clay in relation to sand. The sand in both of these divisions is usually fine-textured. From the

standpoint of production, the least desirable soils in the area are those with impervious subsoils. Relatively small acreages of such soils occur in both the loam and the clay divisions.

The loam soils with permeable subsoils are usually better drained naturally than are the clay soils. All crops grown in the area do well on the well-drained loams, although liming may be required for the successful production of alfalfa. The loam soils can be cultivated over a wider moisture range than can the clay soils, and are generally termed "safe" because of their relatively stable yields under widely varying moisture conditions. Corn yields usually average higher on the loams than on the heavier clays. In low-rainfall seasons, the loams do not dry out so rapidly nor so completely in the soil zone occupied by the shallow-rooted corn plants, and hence are better able to meet the heavy moisture needs of the corn crop. This is particularly significant because, as indicated later in this bulletin, the seasonal distribution of rainfall, even during years of normal precipitation, is usually lowest during the late summer, when the moisture needs of the corn crop are heaviest.

The clay soils contain more organic matter than do the loam soils, and generally are classed as stronger soils. When adequately drained, the clay soils with permeable subsoils are generally highly productive, and are particularly well adapted to the growing of alfalfa because of their high lime content. In relatively dry years, high yields of cotton are obtained, but in years of excessive rainfall the stalk growth may be profusely rank at the expense of lint production. Adequate drainage is particularly important on the clay soils because of their relatively low elevation, and the narrow range of optimum moisture conditions under which they can be most successfully tilled.

The frequent overflows formerly served to renew the organic content and the fertility of the soil, and permitted an exploitative type of agriculture to be practiced without decreasing soil productivity. With flood protection, however, it is increasingly evident on some of the soils that have been in cultivation for a long time that more attention needs to be given to the planned conservation and renewal of humus and plant nutrients, particularly nitrogen.

The turning under of leguminous crops is becoming an increasingly widespread practice. It has been a common practice to interplant crops such as cowpeas and soybeans in corn and plow under the residue after corn harvest. During the last 5 years, this practice has been supplemented to an important extent by the turning under of leguminous winter cover crops. Systematic crop rotations, however, are not commonly followed. Nitrogenous commercial fertilizers are usually applied to cotton and oats, and frequently to corn.

### NATIVE VEGETATION

Most of the area formerly was heavily forested, principally in hardwoods like gum, oak, cypress, hickory, and pecan. Soils that are too wet for cultivation support a dense growth of trees, but with the extension of drainage systems much of this land is being cleared and brought into cultivation. A common means of clearing cut-over timberland in the area is to contract for the work to be done by tenants who receive rent-free all of the first two or more field crops that they grow on the new land.

Bermuda, the most common pasture grass here, grows well on all types of soils. Bermuda and Johnson grass are difficult to control once they gain a foothold on cultivated land. Coco or nutgrass, crabgrass, and the so-called "tie vines" also are obnoxious weeds on cultivated land. The heavy weed growth encouraged by the combination of a productive soil and abundant rainfall necessitates frequent cultivations and hoeings of row crops.

### CLIMATE

Data on the long-time average rainfall and on the annual rainfall recorded at selected stations during each year of the study are shown in table 1 and figure 4. The annual rainfall usually does not fluctuate widely from year to year, and severe droughts seldom occur. For example, precipitation data for a period of 36 years at Greenwood, Leflore County, indicate that the annual rainfall for 26 of the years varied less than 20 percent from the long-time average of 53 inches, and in only 4 years did the rainfall vary more than 25 percent from the average.

TABLE 1.—*Rainfall at six weather stations in the Yazoo-Mississippi Delta area, 1932–36*

| Station [1] | County | Years in rainfall record | Average annual rainfall | Annual rainfall | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 1932 | 1933 | 1934 | 1935 | 1936 |
| | | *Number* | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* |
| Austin | Tunica | 33 | 52.61 | 58.43 | 58.13 | [2] | 50.09 | 44.38 |
| Clarksdale | Coahoma | 27 | 48.33 | 61.34 | 50.11 | 45.20 | 48.32 | 33.63 |
| Rosedale | Bolivar | 25 | 49.16 | 66.33 | 57.12 | 47.21 | 46.11 | 32.80 |
| Greenwood | Leflore | 36 | 52.91 | 74.18 | 45.77 | 55.99 | 46.35 | 38.55 |
| Greenville | Washington | 14 | 50.87 | 61.70 | 54.80 | 60.37 | 46.38 | 35.02 |
| Anguilla | Sharkey | 28 | 51.69 | 66.74 | 47.79 | 52.99 | 46.72 | [2] |

[1] For location of stations, see fig. 1.
[2] Reports incomplete.

Weather Bureau.

The rainfall usually is heaviest in the winter and spring; it decreases during the summer, and reaches its lowest point in the early fall. This seasonal distribution is particularly favorable to cotton production. An abundant spring rainfall, provided it does not hinder seed-bed preparation and timeliness of planting, enables the cotton crop to attain a quick and early growth, an important essential in combating boll weevil and other insects. At the peak of the growing season, on the other hand, low rainfall and sunshine are effective in promoting fruiting, in decreasing weed growth, and in lessening the damage from insects and diseases. The low average rainfall during the harvest season is a factor in the production of high-grade cotton in the area.

The average seasonal distribution of rainfall is not so favorable for corn production as it is for cotton. The relatively low average rainfall during the growing season occurs when moisture usually is most needed by the corn crop. Consequently, high yields of cotton are often associated with low yields of corn in the area, and vice versa.

This is borne out in part by observations of the association of cotton and corn yields with rainfall obtained during June, July, and August at the Delta Branch Experiment Station, covering a period of 16 years. During that period, the average precipitation in June, July, and August

was 25 percent or more below average for 6 years. The average yield of cotton for these 6 years was 25 percent above, and the average yield of corn was 19 percent below their respective average yields for the

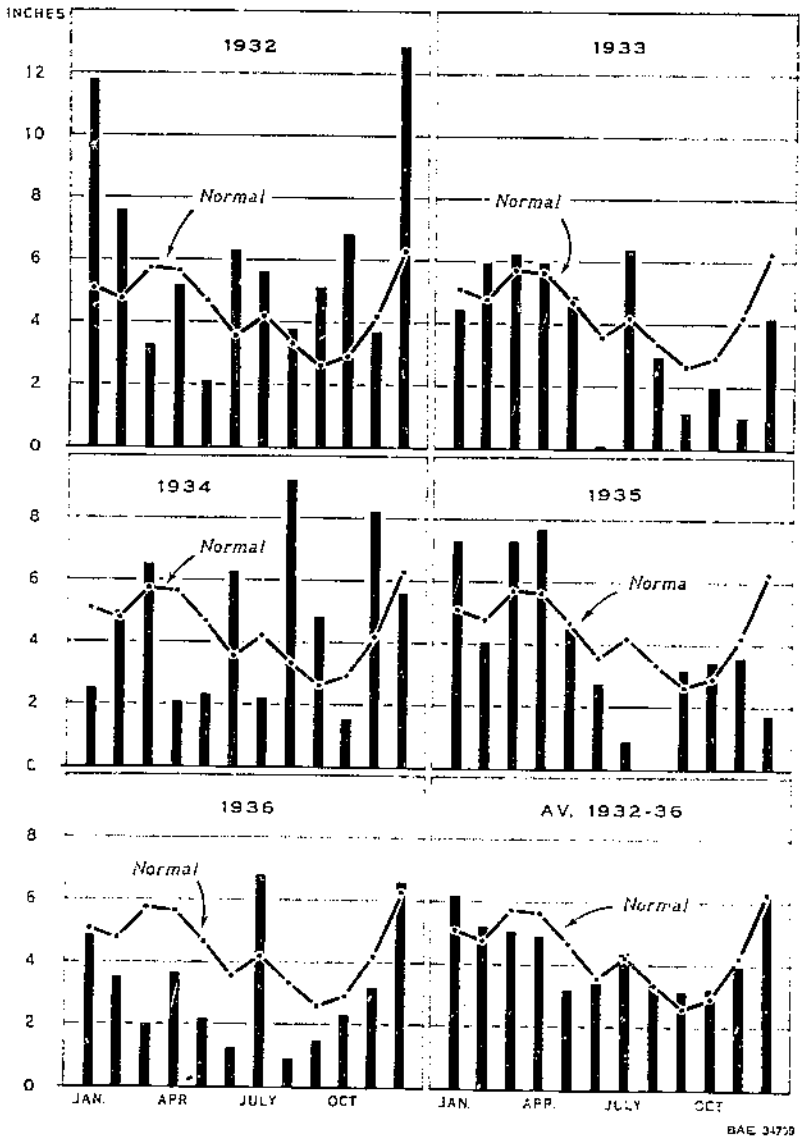



FIGURE 4.—Distribution of rainfall by months for each year and for the 5-year average, 1932-36, compared with the normal or long-time average, at Greenwood, Leflore County, Yazoo-Mississippi Delta area. (U. S. Weather Bureau.)

entire 16-year period. In the 5 years in which rainfall was 25 percent or more above average during June, July, and August, cotton yields were 30 percent below their 16-year average and corn yields were 15 percent above their average for the same period. These data are

based on a 3-year rotation, without fertilizer, of cotton, oats and sagrain, and corn.

Other observations of the association of cotton and corn yields with the precipitation in June, July, and August were in the same general direction as indicated above. These data are not entirely conclusive, of course, because of the few years involved in the test and the impossibility of removing the influence of other factors such as the amount, distribution, and type of rainfall during the entire year, the influence of climatic conditions on insects and diseases, and others. Moreover, occasional years occur when moisture may be too deficient or too plentiful for both cotton and corn.

The data do indicate, however, the general influence of rainfall distribution on yields of cotton and corn and furnish an explanation, at least in part, of the relatively unimportant position in the area's agriculture of corn and other feed crops with similar moisture requirements.

Information on the length of the growing season at a representative station is shown in table 2. The average dates of the last killing frost in the spring and of the first killing frost in the fall are March 24 and November 1, respectively, leaving an average frost-free growing season of 222 days. There are also indicated in the table the ranges in frost dates and lengths of growing seasons within which 68 percent of the years may be expected to fall, assuming a continuation of weather conditions as in the past.

Because of the warm climate and high humidity during much of the growing season, insect pests and diseases affect practically every staple crop grown in the area. Of greatest economic importance are those insects and diseases that affect cotton. The boll weevil usually is the most injurious of these. Other insects of major importance that affect cotton are the cotton plant bug, the tarnished plant bug, the cotton flea hopper, and the plant louse. Severe infestations of leaf worms occur only occasionally. Wilt and angular leaf spot or bacterial boll rot are the most important diseases affecting cotton. The heaviest insect and disease damage ordinarily occurs during growing seasons having wet, sultry weather.

TABLE 2.—*Dates of first and last killing frosts, and length of growing season, Greenwood, Leflore County, Yazoo-Mississippi Delta area, annual 1932–36 and 37-year average*

| Year | Last killing frost in spring | First killing frost in fall | Frost-free days |
|---|---|---|---|
| | | | *Number* |
| 1932 | Mar. 14 | Nov. 12 | 243 |
| 1933 | Mar. 21 | Nov. 8 | 232 |
| 1934 | Mar. 28 | Nov. 12 | 229 |
| 1935 | Mar. 12 | Nov. 18 | 251 |
| 1936 | Apr. 3 | Nov. 15 | 226 |
| Average, 37 years | Mar. 24 | Nov. 1 | 222 |
| Average dates and lengths of growing season within which would fall 68 percent of the years. | Mar. 10–Apr. 7 | Oct. 21–Nov. 10 | 206–236 |

Weather Bureau.

## HISTORICAL DEVELOPMENT

The agricultural development of the Yazoo-Mississippi Delta area was retarded by flood hazards and inadequate drainage, and by the lack of adequate internal transportation facilities. In 1880, only 12 percent of the total land area was improved, and the population,

entirely rural, averaged only three persons per 100 acres of total land area. Farm land and improvements were valued at an average of $14 per acre. After 1880, the construction of a more adequate system of flood-control levees along the Mississippi River, improved drainage, and increased railroad facilities were associated with a tremendous increase in the agricultural development and in the population of the area. From 1880 to 1890, the proportion of the total area in improved land was nearly doubled, and the population per 100 acres increased by 50 percent. The value per acre of farm real estate also increased by approximately 50 percent within that decade.

The upward trend in the agricultural development and in the population of the area has continued until the present. In 1935, nearly 71 percent of the land in the area was in farms, and about 73 percent of the farm land was improved. Of the total land in the area, approximately 52 percent was classed as improved land. In 1930, the most recent year for which such data are available, the population averaged 11 persons per 100 acres of total land area. The area is still predominantly rural; only 20 percent of the total population in 1930 lived in incorporated places. The nature and extent of agricultural production in the area and data on certain related factors are shown in table 3 for selected census years from 1880 through 1935.

TABLE 3.—*Density of total population and of rural population, agricultural land use, production of major crops and numbers of principal classes of livestock per unit of farm land, drainage districts, railroad mileage, and proportion of farm tenancy in the Yazoo-Mississippi Delta area, for census years 1880–1935*

| Item | | 1880[1] | 1890 | 1900 | 1910 | 1920[1] | 1930 | 1935 |
|---|---|---|---|---|---|---|---|---|
| Total land area | 1,000 acres | 3,335 | 3,335 | 3,335 | 3,335 | 3,473 | 3,473 | 3,473 |
| Total population per 100 acres of land area | number | 3.0 | 4.5 | 5.9 | 7.6 | 9.1 | 11.0 | (2) |
| Proportion of total population that was rural[3] | percent | 100.0 | 97.0 | 88.9 | 84.8 | 81.6 | 79.9 | (2) |
| Proportion of total land area in— | | | | | | | | |
| Farms | do | 31.8 | 44.0 | 41.8 | 52.2 | 55.1 | 65.7 | 70.8 |
| Improved land[4] | do | 11.6 | 22.8 | 27.9 | 37.6 | 44.3 | 53.1 | 51.9 |
| Proportion of farm land classed as improved | do | 36.2 | 51.8 | 66.6 | 72.1 | 80.5 | 80.7 | 73.3 |
| Proportion of farm land in— | | | | | | | | |
| Cotton | do | 21.9 | 34.9 | 35.4 | 42.2 | 53.8 | 62.0 | 35.7 |
| Corn | do | 7.9 | 7.3 | 14.1 | 11.7 | 16.3 | 8.3 | 21.3 |
| Hay | do | .1 | .5 | .5 | .9 | 1.6 | 2.8 | 8.5 |
| Production per 100 acres of farm land: | | | | | | | | |
| Cotton | running bales | 17.5 | 22.5 | 22.6 | 18.3 | 21.9 | 35.6 | 18.7 |
| Corn | bushels | 171 | 178 | 389 | 237 | 301 | 189 | 316 |
| Hay | tons | .1 | .8 | 1.0 | 1.2 | 2.9 | 5.0 | 12.1 |
| Livestock per 100 acres of farm land: | | | | | | | | |
| All horses and mules | number | 2.3 | 2.7 | 4.4 | 3.9 | 5.0 | 4.1 | 3.6 |
| All cattle | do | 4.4 | 4.1 | 4.4 | 4.6 | 3.9 | 2.1 | 3.6 |
| All swine | do | 5.1 | 4.0 | 11.5 | 10.1 | 8.9 | 5.0 | 7.2 |
| All chickens | do | 11.2 | 29.4 | 59.9 | [5]37.7 | 52.6 | 35.4 | 46.1 |
| Value per acre, farm land and buildings | dollars | 14.30 | 21.03 | 25.40 | 47.16 | [6]94.07 | 87.20 | 47.64 |
| Proportion of farms operated by tenants | percent | (2) | 83.0 | 89.8 | 92.4 | 94.1 | 94.9 | 93.2 |
| Approximate number of drainage districts[8] | number | (2) | (2) | (2) | 0 | 53 | 100 | (2) |
| Approximate area in drainage districts[8] | 1,000 acres | (2) | (2) | (2) | 327 | 1,987 | 2,926 | (2) |
| Railroad mileage[7] | miles | 80 | 578 | 718 | 1,008 | 1,019 | 894 | 864 |

[1] From 1880 through 1910, the census data pertain to 9 counties—Bolivar, Coahoma, Issaquena, Leflore, Quitman, Sharkey, Sunflower, Tunica, and Washington. From 1920 through 1935, the data pertain also to Humphreys County, organized in 1918.

[2] Comparable data not available.

[3] Farm population plus population in unincorporated places.

[4] Land that was harvested, idle, fallowed or in crop failure, plowable pasture, and, except in 1930 and 1935, land occupied by farm buildings.

[5] All poultry.

[6] Data from House Document No. 198, 73d Cong., 2d sess., 1934. These data pertain to the entire area, including all or parts of 19 counties.

[7] Information obtained from railroads. The data pertain to the entire area, including all or parts of 19 counties.

[8] Bureau of the Census, except as otherwise stated.

Further development of the area will depend largely upon the correction of the overflow and drainage problem still present in some parts, and upon the agricultural prices and incomes that may prevail. A considerable acreage of land included in farms is still in process of being cleared, particularly following years of favorable incomes.

From the beginning of its rapid development the agriculture of the area has been characterized by a high degree of specialization in cotton production, and by the relative unimportance of feed production and of livestock other than work stock (table 3). In 1880, the acreage in cotton occupied only about 22 percent of the total farm land, but comprised 60 percent of the farm land that was improved. Corn and hay, the other most important crops, comprised only about 8 and 0.1 percent, respectively, of the farm land that year. Variations occurred from year to year in the relative proportions of the farm land in these three major crops, but the proportion in cotton trended steadily upward until recent years. Decreases in cotton acreage and increases in the area in corn and hay from 1930 to 1935 resulted primarily from the cotton-acreage-adjustment programs of the Agricultural Adjustment Administration, beginning in 1933.

The relative unimportance of feed production was reflected in a small number of livestock other than work stock in the area generally. Cattle were the most important class of livestock in 1880, but the number per 100 acres of farm land decreased as additional cropland was cleared and range grazing became more restricted. The number of hogs and chickens per 100 acres of farm land increased with the expansion of the crop area, but they were principally minor home-use enterprises, and usually insufficient to provide for the needs of the increasing farm population.

Thus the development since 1880 has largely been an expansion of a type of agriculture based principally on the production of cotton. Several factors influenced this high specialization in cotton production. A contributing factor was the influx from older parts of the Cotton Belt of farmers and laborers experienced in cotton growing. Probably foremost, however, was the factor that is now operative in the area generally; that is, cotton usually is more remunerative than any other crop grown in the area generally, and farmers find it to their economic advantage to specialize in its production. Corn and other feed crops are grown extensively, but principally as complementary enterprises to furnish feed for work stock kept primarily for the production of cotton.

Agricultural land values in this area generally are based largely on the actual or potential returns from systems of farming based principally on cotton production. Land values in turn serve effectively to limit the economic use of improved agricultural land in farming systems that are less intensive than the cotton system, particularly if mortgages are outstanding against the land. Closely associated with land values has been the availability of an abundant supply of labor sufficiently low-priced to permit land to be used intensively.

Another characteristic of the area, from its early development to the present, is the high proportion of farms operated by tenants. In 1890 about 84 percent of the farms in the area were operated by tenants (table 3). Increases were noted each census year until 1930, when approximately 95 percent of the farms were operated by tenants.

In 1935, the proportion of farms operated by tenants had decreased slightly to about 93 percent. The term "farm" as used in table 3 follows the practice of the United States Census Bureau of classifying the land operated by each tenant as a separate farm. Thus a plantation with 49 tenant families and a small acreage in wage crops is indicated in census reports as 50 separate farms.

The high proportion of tenancy is closely associated with the conditions that have resulted in large operating units, or plantations, in the area. The land generally is highly productive, and, on the basis of the farm systems and incomes that have prevailed, the more successful or thrifty farmers have been able to accumulate larger holdings than they could operate with their own labor, or desirable opportunities for investment were presented to others. This in turn necessitated the hiring of labor on either a cash or a share basis. The large proportion of the labor operating on a share basis is influenced in part by factors such as custom and the type of people hired, but more largely by considerations related to the system of farming that is followed and to the mutual interest of employer and employee.[5]

### PRESENT AGRICULTURE

A summary of certain of the major characteristics of the agriculture of the 10 counties completely within the area is given in table 4. The situation in these 10 counties is representative of the conditions in those parts of the 9 other counties that lie within the area, but for which no separate statistical data are available. Comparable data are also shown in the table for the 10 principal cotton-producing States to indicate the relative position of the Yazoo-Mississippi Delta area in the agriculture of the Cotton Belt generally. Census data for 1929 are used because of the dislocations in the agriculture of certain sections of the Cotton Belt caused by drought in 1934.

The Yazoo-Mississippi Delta area is one of the most highly specialized cotton-producing areas in the United States. In 1929, approximately 66 percent of the land was in farms, and 80 percent of the farm land was cropland. Of the cropland, 78 percent was in cotton, 10 in corn, 2 in annual legumes, 1 in alfalfa, and 9 percent in other crops, principally for food and feed. The value of cotton lint and seed comprised about 92 percent of the total value of all agricultural products in the area, and 40 percent or more of the total value of all agricultural products on 97 percent of the farms. Livestock other than work stock were relatively unimportant.

The high specialization in cotton production combined with high yields of cotton result in a relatively high gross income per 100 acres of farm land. This in turn is reflected in a relatively high average value per acre of farm land. Because of the small acreage operated per individual, however, the average income per agricultural worker was lower in the Yazoo-Mississippi Delta area in 1929 than in the 10 principal cotton-producing States.

If the land operated by each tenant be classed as a farm, as reported in the census, the proportion of tenancy in the Yazoo-Mississippi Delta area is very high as compared with the Cotton Belt generally. As shown in table 4, approximately 95 percent of the farms in the 10 counties completely within the area were operated by

[5] For a fuller description of tenants and wage laborers on the cotton plantations, see section beginning on p. 40.

tenants in 1929 as compared with only about 59 percent of the farms so operated in the 10 major cotton States. The proportions of the farm land operated by tenants is smaller in each case, however, in that farms operated by owners or managers are larger than farms operated by tenants. Sharecroppers are the most numerous form of tenancy in the area, whereas other forms of tenancy predominate in the Cotton Belt generally.

TABLE 4.—*Comparative summary of selected data pertaining to the agriculture of the Yazoo-Mississippi Delta area and of the 10 principal cotton-producing States* [1]

| Item | | Yazoo-Mississippi Delta area | 10 principal cotton States |
|---|---|---|---|
| Proportion of approximate land area in farms | percent | 65.7 | 63.5 |
| Proportion of farm land in cropland | do | 79.6 | 38.5 |
| Proportion of farm land in cotton | do | 62.0 | 14.6 |
| Proportion of cropland in cotton | do | 78.0 | 38.0 |
| Average yield of cotton lint per acre, 5-year period 1928–32 [2] | pounds | 222.2 | 168.9 |
| Cotton production per 100 acres farm land | bales [3] | 35.6 | 4.8 |
| Value of agricultural products per acre of farm land | dollars | 39.58 | 9.76 |
| Value per acre of farm land and buildings | do | 87.20 | 32.79 |
| Value per acre of farm land, excluding buildings | do | 69.40 | 25.49 |
| Proportion of total value of agricultural products from cotton lint and seed | percent | 91.8 | 47.0 |
| Agricultural workers 10 years old and over per 100 acres of farm land | number | 7.2 | 1.6 |
| Value of agricultural products per worker | dollars | 548.09 | 610.72 |
| Proportion of farms operated by tenants | percent | 94.9 | 59.3 |
| Proportion of farm land operated by | | | |
| Croppers | do | 45.9 | 10.1 |
| Cash tenants | do | 11.8 | 8.5 |
| Other tenants | do | 14.7 | 20.4 |
| Proportion of rural-farm population colored | do | 81.1 | 34.2 |
| Proportion of tenants colored | do | 86.1 | 41.7 |
| Livestock per 100 acres of farm land: | | | |
| Horses and mules | number | 4.1 | 2.0 |
| Cattle | do | 2.1 | 5.1 |
| Swine | do | 5.0 | 3.3 |
| Chickens | do | 35.4 | 27.1 |
| Total land area per farm | acres | 28.5 | 105.9 |
| Cropland per farm | do | 22.7 | 40.8 |

[1] Data for 1929 unless otherwise specified. Data for the Yazoo-Mississippi Delta area pertain to the 10 counties completely within the area—Bolivar, Coahoma, Humphreys, Issaquena, Leflore, Quitman, Sharkey, Sunflower, Tunica, and Washington. The 10 principal cotton-producing States are North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas.

[2] Data from the Bureau of Agricultural Economics.

[3] Running bales.

Bureau of the Census except as otherwise stated.

A higher proportion of the farm population is colored than in the Cotton Belt generally. In 1929, about 81 percent of the rural farm population and 86 percent of the tenants were colored persons, principally Negroes. Comparable proportions for the 10 major cotton-producing States were about 34 and 42 percent, respectively.

Although small farms are numerous, the greater proportion of the farm land is in large operating units, or plantations. Indication of this is given in table 5 in terms of the situation in 1934 in the 10 counties completely within the area. These data were obtained from individual applications submitted under the terms of the Bankhead Cotton Act of 1934 by owners, cash tenants, and other tenants who managed the operation of their farms.

The term "farm" as used in the applications pertained to all of an applicant's farm holdings in a county, although in some cases holdings operated from different farming headquarters in the same county

were reported individually as separate farms. Thus the data pertain to individual holdings and management units within each county regardless of the number of tenants per farm, and are better representative of the size of individual operations in the area than are census data that indicate each tenant tract as a separate farm. As shown in table 5, approximately 56 percent of the farms were 80 acres and less in size. But these farms contained only about 10 percent of the farm land in the area. Only 13 percent of the farms were more than 500 acres in size, but this relatively small number of farms contained about 64 percent of the total farm land. Approximately 2 percent of the farms were of more than 2,000 acres and contained about 22 percent of the farm land.

TABLE 5.—*Proportion of farms and of farm land in units of various sizes, Yazoo-Mississippi Delta area, 1934*[1]

| Size of farm (acres) | Proportion of all farms | Proportion of total farm land | Size of farm (acres) | Proportion of all farms | Proportion of total farm land | Size of farm (acres) | Proportion of all farms | Proportion of total farm land |
|---|---|---|---|---|---|---|---|---|
| | *Percent* | *Percent* | | *Percent* | *Percent* | | *Percent* | *Percent* |
| 1–20 | 10.7 | 0.6 | 141–160 | 5.1 | 3.1 | 751–1,000 | 2.6 | 8.3 |
| 21–40 | 24.5 | 3.5 | 161–200 | 3.2 | 2.4 | 1,001–1,250 | 1.6 | 7.5 |
| 41–60 | 8.3 | 1.7 | 201–250 | 3.3 | 3.0 | 1,251–1,500 | 1.1 | 5.8 |
| 61–80 | 12.0 | 3.7 | 251–300 | 2.2 | 2.5 | 1,501–2,000 | 1.3 | 8.7 |
| 81–100 | 4.0 | 1.4 | 301–400 | 4.4 | 6.0 | 2,001 and over | 1.6 | 21.5 |
| 101–120 | 4.4 | 2.0 | 401–500 | 2.9 | 5.2 | | | |
| 121–140 | 2.0 | 1.0 | 501–750 | 4.8 | 11.6 | Total | 100.0 | 100.0 |

[1] The data pertain to the 10 counties listed in footnote 1, table 4. The term "farm" as used here refers to a unit covered by an individual application submitted under the terms of the Bankhead Cotton Act of 1934. Applications were submitted by owner-operators, cash tenants, standing-rent tenants, tenants who managed their own operations, or by authorized representatives.

Farm Security Administration. Unpublished data compiled by C. O. Henderson from applications submitted in 1934 under the terms of the Bankhead Act.

The favorable climate and fertile soils permit the production of longer-staple cotton than in the Cotton Belt generally (table 6). During the 5-year period 1928–32, approximately 90 percent of the cotton produced in 12 counties almost wholly within this area was 1 1/16 inches in length and longer. In the 10 principal cotton-producing States, on the other hand, only 10 percent of the cotton grown during the same period was of this length. During the 1928–32 period, the 12 counties for which data are shown in table 6 accounted for an average of 56 percent of the United States production of cotton of 1 1/8 inches and longer. Consequently, unless their cotton is of low grade, producers in the Yazoo-Mississippi Delta area generally obtain a premium over the basis prices quoted for ¾-inch Middling cotton (table 7).

It is usually only in unfavorable harvesting seasons of prolonged wet weather that grades are adversely affected. During the 5-year period 1928–32, an average of approximately 72 percent of the cotton produced in the 12 Yazoo-Mississippi Delta counties averaged Middling White or better in grade. This compares with 70 percent of the cotton in the 10 principal cotton-producing States that graded as high during the same period.

TABLE 6.—*Comparison of the proportions of the cotton crop of various staple lengths, Yazoo-Mississippi Delta area and 10 principal cotton-producing States, average 1928–32* [1]

| Staple length (inches) | Yazoo-Mississippi Delta area | 10 principal cotton States | Staple length (inches) | Yazoo-Mississippi Delta area | 10 principal cotton States | Staple length (inches) | Yazoo-Mississippi Delta area | 10 principal cotton States |
|---|---|---|---|---|---|---|---|---|
| | *Percent* | *Percent* | | *Percent* | *Percent* | | *Percent* | *Percent* |
| Shorter than 7/8 | (2) | 12.5 | 1 and 1 1/32 | 8.3 | 12.4 | 1 1/16 and 1 3/32 | 12.9 | 1.0 |
| 7/8 and 29/32 | 0.5 | 40.3 | 1 1/16 and 1 3/32 | 33.7 | 5.5 | 1 1/4 and longer | 1.5 | .1 |
| 15/16 and 31/32 | 1.5 | 24.6 | 1 1/8 and 1 5/32 | 41.6 | 3.6 | | | |
| | | | | | | Total | 100.0 | 100.0 |

[1] Data for the Yazoo-Mississippi Delta area pertain to the 10 counties listed in footnote 1, table 4, and, in addition, to Tallahatchie and Warren Counties. The 10 principal cotton-producing States also are listed in footnote 1, table 4.
[2] Less than 0.1 percent.

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TABLE 7.—*Spot prices of Middling cotton of various staple lengths, and percentage premiums above 7/8-inch cotton, Memphis, average 1925–31* [1]

| Staple length (inches) | Price per pound | Premium above 7/8 inch | Staple length (inches) | Price per pound [1] | Premium above 7/8 inch | Staple length (inches) | Price per pound [1] | Premium above 7/8 inch |
|---|---|---|---|---|---|---|---|---|
| | *Cents* | *Percent* | | *Cents* | *Percent* | | *Cents* | *Percent* |
| 7/8 | 13.20 | 0.0 | 1 1/16 | 14.60 | 10.6 | 1 3/16 | 16.69 | 26.4 |
| 15/16 | 13.61 | 3.1 | 1 1/8 | 15.38 | 16.5 | 1 1/4 | 19.52 | 47.9 |
| 1 | 14.07 | 6.6 | | | | | | |

[1] Averages of yearly averages. Prices of cotton of over seven-eighths of an inch determined from quoted premiums.

Bureau of Agricultural Economics.

## PLANTATION ORGANIZATION, OPERATION, AND EARNINGS

The average earnings on the plantations studied varied widely from year to year as a result of changes in production organizations and yields, in prices paid and received, and in payments obtained for participating in Government agricultural adjustment programs. The average situation that existed in respect to these factors during each of the 5 years of the study is given here. This will provide a descriptive background for an analysis of the factors causing variations in earnings among plantations, and for an economic evaluation of various types of plantation organization and operation common to the area.[6] The presentation here pertains to the plantation as a whole. Reference is made to tenant operations, but the treatment is primarily in terms of the plantation operator's returns. A more detailed examination of tenant operations and returns occurs later.[7]

Changes were made in the plantations studied from year to year, consequently the data presented on individual items of plantation organization and operation do not always indicate trends that may have been in progress in the area. Information for certain items that represent significant trends is given at pertinent points, however, in

[6] The reader who is already familiar with the situation in the area during the period of the study may prefer to omit reading this descriptive section, and to proceed directly to the sections relating to the planning of plantation organizations and operation, beginning on p. 54.
[7] See section beginning on p. 40.

terms of those plantations for which data were obtained during all 5 years.

The largest proportion of the plantations studied contained from 650 to 800 acres in crops, and, if operated on a share basis, had from 30 to 40 tenant families. Holdings materially larger than this most common size usually are subdivided into two or more operating units, each with its own resident manager or overseer; its headquarters of manager's dwelling, barns, tool shed, and blacksmith shop; and its complement of tenant and wage-laborer houses. The data obtained pertain to one-unit plantations operated by their owners or by managers who exercised all the prerogatives of owners, but the information is applicable also to the individual operating units that constitute parts of multiple-unit plantations.

A few plantations operated by hired managers were considered owner-operated for the purposes of this study, and no charges were made in the plantation expenses for the manager's salary. A few of the plantations had gins and stores, but transactions in connection with these enterprises were not considered, except in the case of credit advances made through the store to the plantation tenants. The ginning of cotton grown on the plantations that had gins was charged as an expense at prevailing rates.

## LAND ORGANIZATION

During the 5-year period 1932-36, an average of 738 acres per plantation, or 79 percent of the total plantation area, was in cropland. Data on the average organization of land on the plantations are shown in table 8. Of the total cropland, an average of 2 percent was idle. Normally, little or no cropland is left idle on plantations; the largest acreages idle during the period of the study were in 1934 and 1935, years of large reduction in cotton acreage. Of the total plantation area, an average of 10 percent was in woodland; 6 percent in farmsteads, roads, and ditches; 2 percent in waste; and the remainder in permanent pastures and orchards.

The relatively large acreage in woodland is the source of fuel for the plantation families. A large proportion of the woodland on plantations comprises low, wet land unsuited for cultivation until drained. The long-time upward trend in crop acreage is attributable in large part to the gradual clearing and draining of surplus woodland on farms and plantations.

Another significant factor in land use on plantations is the large area occupied by farmsteads, principally tenant home sites and gardens, and by ditches, roads, and turnrows. Permanent pastures, on the other hand, are almost insignificant because of the few livestock other than work stock that are kept, and the greater relative productivity of rotation pastures and cultivated feed crops. The waste land on plantations comprises principally watercourses or small lakes. A small acreage in orchards, principally pecans, is maintained primarily for home use.

Cotton was the only significant cash crop on the plantations, the remainder of the cropland being devoted to the production of feed, primarily for the plantation work stock. An average of approximately 61 percent of the cropland on the plantations was in cotton during the 5-year period 1932-36. In 1932 and 1933, almost three-

fourths of the cropland in these plantations was planted to cotton, but in 1933 an average of 28 percent of the acreage in cotton was plowed up before harvest in cooperation with the cotton-reduction program of the Agricultural Adjustment Administration. Curtailments in cotton acreage also occurred in 1934, 1935, and 1936 in cooperation with the cotton-acreage-adjustment programs of the Agricultural Adjustment Administration, and in conformity with the Bankhead Cotton Act, under which a tax penalty was incurred in 1934 and 1935 for cotton ginned in excess of a specified quota per plantation. A significant increase in the proportion of cropland in cotton occurred in 1936 as a result of more favorable prices and of relaxations in production restrictions. These variations in cotton acreage were associated with increases or decreases in the acreages in corn, alfalfa, soybeans, and other hay crops.

TABLE 8.—*Organization of all land and of cropland per plantation, 1932–36*

| Item | 1932 | 1933 | 1934 | 1935 | 1936 | 5-year average 1932–36 |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Plantations studied | 24 | 26 | 26 | 20 | 22 | 24 |
| | *Acres* | *Acres* | *Acres* | *Acres* | *Acres* | *Acres* |
| Plantation area | 934 | 899 | 934 | 935 | 945 | 929 |
| Land in crops | 750 | 699 | 735 | 740 | 768 | 738 |
| Cropland idle | 8 | 22 | 27 | 24 | 4 | 17 |
| Orchards (pecan) | 5 | 4 | 0 | 1 | 0 | 2 |
| Permanent pasture | 3 | 3 | 5 | 5 | 13 | 6 |
| Woodland | 97 | 93 | 92 | 90 | 93 | 93 |
| Farmsteads, roads, and ditches | 45 | 53 | 63 | 60 | 65 | 57 |
| Waste | 26 | 25 | 12 | 15 | 2 | 16 |
| Cropland in | | | | | | |
| Cotton | 536 | 1 206 | 388 | 396 | 436 | 452 |
| Corn and interplanted legume | 112 | 119 | 201 | 191 | 166 | 158 |
| Oats (for grain) | 19 | 5 | 14 | 5 | 21 | 13 |
| Soybeans (for seed) | 10 | 0 | 8 | 26 | 18 | 12 |
| Alfalfa hay | 28 | 25 | 32 | 37 | 42 | 33 |
| Soybean and cowpea hay | 17 | 21 | 47 | 27 | 30 | 28 |
| Other hay crops | 7 | 12 | 15 | 13 | 32 | 16 |
| Rotation pasture | 6 | 6 | 10 | 13 | 5 | 8 |
| Miscellaneous crops [2] | 17 | 2 | 24 | 32 | 30 | 22 |
| | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| Proportion of farm land in crops | 80.3 | 77.8 | 78.7 | 79.1 | 81.4 | 79.4 |
| Proportion of cropland in— | | | | | | |
| Cotton | 71.5 | 72.4 | 52.8 | 53.5 | 56.7 | 61.3 |
| Corn and interplanted legume | 15.0 | 17.0 | 27.3 | 25.8 | 21.6 | 21.4 |
| Oats (for grain) | 2.5 | .7 | 1.9 | .7 | 2.7 | 1.7 |
| Soybeans (for seed) | 1.3 | 0 | 1.1 | 3.5 | 2.3 | 1.6 |
| Alfalfa hay | 3.7 | 3.6 | 4.4 | 5.0 | 5.5 | 4.5 |
| Soybean and cowpea hay | 2.0 | 3.4 | 6.4 | 3.6 | 3.9 | 3.8 |
| Other hay crops | 1.2 | 1.7 | 2.0 | 1.8 | 4.2 | 2.2 |
| Rotation pasture | .8 | .9 | 1.4 | 1.8 | .7 | 1.1 |
| Miscellaneous crops [3] | 2.3 | .3 | 3.5 | 4.3 | 3.9 | 2.9 |

[1] Of this acreage, 141 acres were plowed under in cooperation with the 1933 cotton-acreage-reduction program of the Agricultural Adjustment Administration. Some of this land later was planted to corn, but most of it failed to produce a crop.

[2] Include 2, 6, and 12 acres double-cropped in 1932, 1934, and 1936, respectively.

[3] Include 0.3, 0.8, and 1.5 percent double-cropped in 1932, 1934, and 1936, respectively.

The soils generally are well adapted to the production of cotton, but on individual plantations the cotton crop is usually given first choice of the more productive soils as well as first consideration in timeliness of planting, cultivation, and harvest.

Corn, the principal feed-grain crop in the area, ranked next to cotton in point of crop acreage occupied on the plantations. Oats also are grown as a feed grain, but were relatively of small importance. Corn,

like cotton, is grown on practically all soils in the area, and often is grown in preference to cotton on the heavier soils on which drainage is relatively slow. Practically all of the corn was interplanted with a legume, principally soybeans. The interplanted legume in wage and sharecropper corn usually is turned under, but share tenants and cash tenants often harvest part of their production for hay, and graze the remainder.

Alfalfa and soybeans were the principal hay crops, although small acreages in sweetclover, cowpeas, and sorghum for hay also were harvested. The choice between the two principal hay crops depends largely on the type of soil on individual plantations. Well-drained clay or clay loam soils usually are better adapted to alfalfa than are the sandy loam soils. Ordinarily, the former are less acid in reaction, maintain satisfactory alfalfa stands over a longer period and produce relatively higher yields of alfalfa than of soybeans or other hay crops. Soybeans, if inoculated, grow well on practically all of the well-drained soils. Soybeans are often planted in excess of hay needs to provide a surplus that is harvested for seed or turned under for soil maintenance.

The rotation or temporary pastures on the plantations were principally sagrain grown alone or interplanted with a legume, usually soybeans.

### LAND ORGANIZATION BY TENURE

The relative importance of various tenant and labor groups on the plantations, expressed in terms of the proportions of the total crop acreage operated by each, is shown in table 9. Sharecroppers operated an average of approximately 47 percent of the cropland on the plantations during the 5-year period, and constituted the most important single source of labor on these plantations. Share tenants operated an average of only about 10 percent of the cropland, while cash tenants, with an average of about 1 percent of the cropland, were relatively unimportant. Wage labor, close to sharecroppers in importance, was used on the remainder, or an average of about 42 percent, of the cropland.

The data in table 9 are not entirely representative of changes in the relative importance of different types of plantation labor from one year to another because of changes in the plantations. In 1932, three of the plantations were operated almost entirely with wage labor and with the use of tractor power. These three were replaced in 1933 with five plantations operated largely with sharecroppers and share tenants, thus affecting the relative distribution of the cropland as between wage labor and share labor. A more accurate indication of changes in the types of plantation labor used is obtained from the 12 plantations for which data were obtained during all 5 years of the study. On these plantations, a pronounced increase occurred from 1933 to 1936 in the proportion of cropland operated with wage labor. This increase in the use of wage labor was associated with a small decrease in the proportion of the cropland operated with sharecroppers, and with a marked reduction in the proportion operated with share tenants. The situation on these 12 plantations was representative, at least in part, of changes in the use of labor in the area generally.[8]

[8] For a fuller discussion of recent changes in the types of labor used on plantations in the area, see section beginning on p. 52.

TABLE 9.—*Organization of cropland according to tenure, per plantation, 1932–36*

| Item | 1932 | 1933 | 1934 | 1935 | 1936 | 5-year average 1932–36 |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Plantations studied | 24 | 26 | 26 | 20 | 22 | 24 |
| Crop acres per plantation | 750 | 699 | 735 | 740 | 768 | 738 |
| | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| Proportion of cropland operated by— | | | | | | |
| Sharecroppers | 43.7 | 54.9 | 48.7 | 46.1 | 41.7 | 46.9 |
| Share tenants | 15.7 | 13.0 | 9.1 | 6.9 | 6.1 | 10.1 |
| Cash tenants | .9 | 1.3 | .6 | 1.3 | .7 | .9 |
| Wage laborers [1] | 40.2 | 30.8 | 42.4 | 45.7 | 53.0 | 42.6 |
| Proportion of sharecropper crops in— | | | | | | |
| Cotton | 85.5 | [2]87.7 | 73.5 | 74.9 | 80.4 | 80.5 |
| Corn (share rented) | 11.1 | 8.5 | 25.2 | 23.4 | 13.7 | 16.3 |
| Corn (cash rented) | 2.8 | 3.8 | 1.3 | 1.7 | 5.9 | 3.1 |
| Hay | .6 | 0 | 0 | 0 | 0 | .1 |
| Proportion of share-tenant crops in— | | | | | | |
| Cotton | 79.5 | [2]84.1 | 68.5 | 68.5 | 68.7 | 75.8 |
| Corn (share rented) | 7.4 | 4.6 | 7.2 | 7.0 | 10.3 | 7.6 |
| Corn (cash rented) | 12.8 | 11.3 | 24.3 | 24.5 | 20.8 | 17.1 |
| Hay | .3 | 0 | 0 | 0 | .4 | .1 |
| Proportion of cash-tenant crops in— | | | | | | |
| Cotton | 100.0 | [2]90.9 | 90.9 | 67.4 | 80.0 | 84.3 |
| Corn | 0 | 6.7 | 9.1 | 26.3 | 20.0 | 12.9 |
| Hay | 0 | 3.3 | 0 | 6.3 | 0 | 2.8 |
| Proportion of wage crops in— | | | | | | |
| Cotton | 31.8 | [2]39.5 | 24.6 | 29.3 | 31.8 | 35.4 |
| Corn | 14.1 | 26.1 | 27.0 | 27.7 | 21.5 | 22.8 |
| Oats (for grain) | 6.3 | 2.4 | 4.6 | 1.4 | 5.2 | 4.1 |
| Soybeans (for seed) | 3.3 | 0 | 2.5 | 7.7 | 4.3 | 3.9 |
| Alfalfa hay | 9.0 | 11.5 | 10.3 | 10.8 | 10.2 | 10.3 |
| Soybean and cowpea hay | 4.1 | 11.3 | 15.2 | 7.8 | 7.4 | 9.0 |
| Other hay crops | 3.0 | 5.4 | 4.9 | 3.8 | 7.9 | 5.1 |
| Rotation pasture | 2.1 | 2.7 | 3.0 | 3.9 | 1.4 | 2.5 |
| Miscellaneous crops | 5.7 | 1.1 | 8.5 | 9.6 | 7.3 | 6.9 |

[1] Include 0.3, 0.8, and 1.5 percent double-cropped in 1932, 1934, and 1936, respectively.
[2] Because of the plow-up program, the harvested cotton acreage represented only 66.1, 62.1, 67.8, and 20.5 percent, respectively, of the cropland operated with sharecroppers, share tenants, cash tenants, and wage labor.

A high proportion of the land operated with tenants was in cotton. The remainder of the tenant cropland was in food and feed crops, principally corn, and a little hay. Share tenants produced relatively more feed than sharecroppers in order to provide at least a part of the needs of their work stock. A considerable proportion of the cornland operated by croppers and share tenants, and particularly the latter, was rented for cash. The cash rent paid for cornland by sharecroppers includes also a rental charge for the plantation mules and equipment used on the rented land. Corn occupied a relatively high proportion of the tenant cropland during the years when cotton acreage was curtailed in cooperation with the programs of the Agricultural Adjustment Administration.

Cash tenants often rent land on more than one plantation, hence the cropland organizations shown for them in table 9 are not entirely representative of their operations.

An average of about 65 percent of the cropland operated with wage labor was in feed crops. Feed crops require relatively little hand labor as compared with cotton and, particularly in the case of hay crops, are well adapted to the use of large-scale equipment. Because of this, it is a common practice for the plantation operator's feed crops to be produced with wage labor and for cotton to be produced principally with share labor. But as already noted, there was an upward trend in the proportion of the cotton acreage that was operated with wage labor during the period of the study. Large-scale

production equipment ordinarily is used on the wage cotton, with hand-labor operations performed largely by transient labor. On plantations on which both wage and tenant crops are found, a considerable proportion of the wage labor may be furnished by tenants at times when they are not occupied on their own crops.

### CROP YIELDS

Average yields of the principal crops on the plantations differed widely from one year to another (table 10). These variations in average yields were influenced primarily by climatic conditions during individual years, and by changes in fertilization and cropping practices.

TABLE 10.—*Yield per acre of principal crops on plantations studied, 1932–36*

| Item | | 1932 | 1933 | 1934 | 1935 | 1936 | 5-year average 1932–36 |
|---|---|---|---|---|---|---|---|
| Cotton lint: | | | | | | | |
| Sharecropper | pounds | 254 | 383 | 314 | 391 | 467 | 356 |
| Share-tenant | do | 246 | 398 | 317 | 374 | 438 | 355 |
| Wage | do | 217 | 379 | 321 | 384 | 436 | 348 |
| Average | do | 230 | 385 | 315 | 387 | 438 | 355 |
| Cottonseed | do | 512 | 867 | 701 | 822 | 969 | 774 |
| Corn: | | | | | | | |
| Sharecropper (share-rented) | bushels | 21 | 14 | 14 | 12 | 12 | 15 |
| Wage | do | 23 | 19 | 20 | 15 | 17 | 19 |
| Average | do | 22 | 17 | 17 | 14 | 15 | 17 |
| Wage oats for grain | do | 11 | 21 | 40 | 27 | 31 | 31 |
| Wage alfalfa hay | tons | 2.0 | 1.7 | 2.4 | 1.7 | 2.0 | 2.0 |
| Wage soybean hay | do | 1.0 | 1.0 | .8 | .9 | .8 | .9 |

The general influence of the seasonal distribution of rainfall on the relative yields of cotton and corn was evidenced during the period. The highest average cotton yields and the lowest average corn yields were obtained in 1933, 1935, and 1936, when the rainfall in June, July, and August was relatively low.[9] The precipitation in August 1936 was high, but most of it occurred in a few heavy rains, followed by clear, sunshiny weather. The lowest average cotton yields and highest average corn yields were obtained in 1932, when the rainfall during each of the 3 months of June, July, and August was substantially above normal.

Cotton yields in the area generally are more favorable than are corn yields not only because of seasonal climatic differences that usually favor cotton production, but also because cotton usually is planted on the most favorable soils on the plantation, receives more timely cultivation, and is fertilized more heavily.

There was no significant difference in the average yields of cotton operated with wage labor, sharecroppers, and share tenants. Although variations occurred during individual years (table 10), these variations probably were influenced more by soil and climatic differences as between plantations than by the type of labor used.

[9] For a more detailed discussion of the influence of the total rainfall in June, July, and August on the relative yields of cotton and corn, see section beginning on p. 10.

Yields of sharecropper corn were somewhat lower than were yields of wage corn, principally because of differences in the type and timeliness of cultivation and in the quantities of fertilizer used. Data regarding yields are not shown for share-tenant corn because the acreage involved was too limited to give representative information.

Variations in yields of oats were closely associated with differences in rainfall during the growing and maturing season. The relatively low yields of oats obtained in 1932, 1933, and 1935 were caused largely by heavy rainfall and high temperatures during the spring months, and by a consequent heavy damage from smut. In 1932, these conditions were aggravated by a late freeze that materially reduced the stands. The largest average yield of oats was in 1936, when favorable growing conditions prevailed and disease damage was relatively light.

Crop yields during the period of the study were affected by the marked increases in the quantities of commercial fertilizers used and in the acreage in winter legumes turned under. The proportion of the cotton acreage fertilized was increased from 4 percent in 1932 to 48 percent in 1936, and the average quantity of fertilizer used per acre treated was increased from 150 to 175 pounds (table 11). A large increase also occurred in the use of commercial fertilizers on corn. Less than 3 percent of the total corn acreage was fertilized in 1932 as compared with approximately 34 percent fertilized in 1936. Nitrogen usually is the only plant-food element in the commercial fertilizers commonly used. The supply of phosphorus and potassium usually is adequate on most of these soils, although favorable response to the addition of these two elements has been obtained in experimental tests near the foothills in the eastern part.[10]

TABLE 11.—*Changes in the quantities of commercial fertilizers used on cotton, corn, and other crops, and in the acreage in cotton preceded by winter legumes turned under, all plantations, 1932–36*

| Item | 1932 | 1933 | 1934 | 1935 | 1936 |
|---|---|---|---|---|---|
| Plantations studied.....number | 24 | 26 | 20 | 20 | 22 |
| Area planted to— | | | | | |
| Cotton[1].....acres | 12,693 | 12,916 | 9,811 | 7,787 | 9,503 |
| Corn[1].....do | 2,702 | 3,062 | 5,208 | 3,774 | 3,627 |
| Other crops[1].....do | 2,505 | 1,928 | 4,141 | 3,046 | 3,927 |
| Commercial fertilizers: | | | | | |
| Fertilizer used.....tons | 38 | 120 | 307 | 329 | 546 |
| Proportion of fertilizer used on— | | | | | |
| Cotton.....percent | 91 | 78 | 75 | 72 | 74 |
| Corn.....do | 9 | 22 | 22 | 24 | 21 |
| Other crops.....do | 0 | 0 | 3 | 4 | 5 |
| Commercial fertilizers on cotton: | | | | | |
| Area in cotton fertilized.....acres | 467 | 1,251 | 2,912 | 2,853 | 4,603 |
| Proportion of total cotton area.....percent | 4 | 10 | 30 | 37 | 48 |
| Fertilizer per acre treated.....pounds | 150 | 150 | 159 | 167 | 175 |
| Plantations on which practice followed.number | 2 | 7 | 14 | 16 | 20 |
| Winter legumes preceding cotton: | | | | | |
| Area in cotton preceded by winter legume turned under.....acres | 140 | 805 | 1,343 | 2,57 | 2,698 |
| Proportion of total cotton area.....percent | 1 | 6 | 14 | 33 | 28 |
| Plantations on which practice followed.number | 2 | 8 | 11 | 16 | 16 |

[1] Wage, sharecropper, and share-tenant crops. Data were not obtained on the operations of cash tenants.

The proportion of the cotton acreage preceded by winter legumes was increased from 1 percent in 1932 to 28 percent in 1936. Commercial fertilizer usually is not used on cotton preceded by a legumi-

[10] The results of these tests are given in service sheets Nos. 225, 226, 227, 228, and 229, issued by the Delta Branch Station of the Mississippi Agricultural Experiment Station.

nous crop turned under. The proportion of the total cotton acreage either fertilized or preceded by winter legumes turned under increased from 5 percent in 1932 to 76 percent in 1936.

The increase in the use of commercial fertilizers and in the acreage in winter legumes was influenced by increased cotton prices and incomes during the period, and by the desire to produce high yields of cotton on the reduced area planted to cotton. In 1936, added inducement to grow soil-building crops was provided by the special payments for this practice under the terms of the conservation program of the Agricultural Adjustment Administration. That the trend was already upward, however, is indicated by the large increases in the acreage in winter legumes during the 3 years immediately preceding 1936. The winter legumes most commonly planted in the area are Austrian Winter peas, Hungarian vetch, hairy vetch, and bur-clover.

### CROP PRODUCTION, PURCHASES, AND DISPOSAL

Discussion of crop production to this point has served to indicate the yearly variations in crop acreages and yields on the plantations, and some of the major factors that influenced these variations. A summary of the plantation operator's shares of the various crops produced, of the additional quantities purchased, and of the quantities sold and used per plantation during the 5 years is shown in table 12.

TABLE 12.—*Plantation operator's share of crops produced, and purchases and disposal of crops, per plantation, average 1932–36* [1]

| Item | | Plantation operator's share of production [2] | Purchased from— | | Sold to— | | Used on plantation | Change in plantation inventory |
|---|---|---|---|---|---|---|---|---|
| | | | Tenants | Outside of plantation | Tenants | Outside of plantation | | |
| Cotton lint | bales [3] | 171.3 | 119.0 | 0.0 | 0.0 | 280.3 | 0.0 | 0.0 |
| Cottonseed, commercial | tons | 76.7 | 54.9 | 0 | 0 | 131.6 | 0 | 0 |
| Cottonseed for planting | do | 16.4 | 0 | 2.3 | .8 | 4.4 | 12.8 | −.7 |
| Corn | bushels | 1,739.0 | 42.0 | 72.0 | 47.0 | 184.0 | 1,561.0 | +58.0 |
| Oats | do | 399.0 | 0 | 51.0 | 12.0 | 37.0 | 361.0 | +43.0 |
| Legume hay | tons | 96.9 | .1 | 5.5 | 4.9 | 11.0 | 81.8 | +1.8 |
| Nonlegume hay | do | 16.2 | 0 | 0 | .2 | 0 | 11.0 | +2.0 |

[1] For number of plantations studied each year, see table 11.
[2] Wage crops plus plantation operator's share of tenant crops.
[3] 500 pounds, gross weight.

Cotton and cottonseed were predominantly the major products sold, an annual average of about 290 bales of lint and 146 tons of seed being sold per plantation. Small quantities of improved seed were purchased from sources outside of the plantation, but most of the seed planted ordinarily is saved from the crop of the preceding year. Usually, sufficient seed is carried over from the preceding year to provide for emergency replantings if necessary, hence a surplus is often available for sale following favorable planting seasons. It will be noted that all of the tenants' shares of the cotton lint and seed produced were bought by the plantation operator, and later resold by him. For the purposes of this study, cotton lint and cottonseed held from one year to another by the plantation operator in the expectation of receiving more favorable prices were considered sold at current market prices during the crop year when these commodities were produced.

There was an average small net surplus of both grain and hay crops on the plantations. A part of the feed used on some of the plantations was purchased, but this was more than offset by the relatively larger production and surplus sales on other plantations. Low cotton prices and incomes in 1931 and 1932 had forced many planters to increase their feed production in order to curtail cash expenses. In subsequent years of the study, reductions in cotton acreage in cooperation with the adjustment programs provided large acreages that were used for feed production. Substantial quantities of excess feed grown on these plantations were sold in 1934 and 1935, when restrictions on the sale of feed produced on Government "rented acres" were removed because of the drought emergency in other parts of the country.

Feed used on cotton plantations in the area is consumed principally by work stock. On the plantations studied, the only livestock other than work stock kept by the operator were a few head of milk cattle, hogs, and chickens for home use. These livestock and their products were relatively so insignificant in the plantation business that detailed information was not obtained on this phase of the operator's family living, and expenses incurred in connection with such livestock were excluded from the plantation business. Some livestock for food were kept by sharecroppers and share tenants, but these also generally were relatively few and unimportant as compared with the number of work stock kept by tenants. Thus a discussion of livestock on the plantations studied is essentially a consideration of work stock as a part of the power used in production.

### POWER ORGANIZATION

An average of 24 mules was kept per plantation during the period of the study (table 13). This animal power was supplemented with an average of 1.6 tractors per plantation. If tractors be expressed in mule equivalents on the basis of relative accomplishments, an average of 35 mule equivalents was kept per plantation. An average of 19 acres in wage and sharecropper crops was worked per mule equivalent.

TABLE 13.—*Power organization on plantations studied, 1932–36*

| Item | 1932 | 1933 | 1934 | 1935 | 1936 | 5-year average 1932–36 |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Plantations studied | 24 | 26 | 26 | 20 | 22 | 24 |
| Crop acres per plantation[1] | 627 | 593 | 664 | 679 | 717 | 657 |
| Mules: | | | | | | |
| Per plantation | 20.2 | 23.0 | 25.7 | 24.4 | 26.1 | 23.9 |
| Per 1,000 acres in crops[1] | 32.2 | 38.4 | 38.7 | 35.9 | 36.4 | 36.3 |
| Tractors: | | | | | | |
| Per plantation | 1.8 | 1.2 | 1.5 | 1.6 | 1.8 | 1.6 |
| Per 1,000 acres in crops[1] | 2.9 | 2.0 | 2.3 | 2.4 | 2.5 | 2.4 |
| Mule equivalents:[2] | | | | | | |
| Per plantation | 33.2 | 31.3 | 35.9 | 35.9 | 38.3 | 34.9 |
| Per 1,000 acres in crops[1] | 53.0 | 52.3 | 54.1 | 52.9 | 53.2 | 53.1 |

[1] Wage and sharecropper crops only. Share-tenant and cash-tenant crops were operated with tenant-owned power.

[2] Tractors converted into mule equivalents on the basis of power furnished in crop production. A tractor used for both land preparation and crop cultivation was considered equivalent to 8 mules; a tractor used primarily for land preparation only was considered equivalent to 6 mules.

Because of changes in the plantations, the data for individual years in table 13 are not entirely representative of the increasing relative importance of tractors as a source of farm power in the area. Census

data for the 10 counties entirely within the Yazoo-Mississippi Delta area show that the number of horses and mules per 1,000 acres of cropland decreased from 61 to 52, or 15 percent, from 1925 to 1930, whereas the number of tractors per 1,000 acres of cropland increased from 0.23 to 0.80, or 248 percent.

That the number of tractors has been increasing at a rapid rate in recent years is also indicated by sales of new tractors in the Yazoo-Mississippi Delta area as reported by five manufacturers of leading tractor types used on plantations there. The number of new tractors sold by these manufacturers in each of the years from 1934 through 1936 was 33, 116, and 195 percent larger, respectively, than the average number sold per year during the 4-year period 1929–32.

Increasing use of mechanical power will decrease the need for feed production for work stock and, with unrestricted cotton production, might induce an even higher proportion of the cropland to be planted to cotton than in the past. Associated with the increase in mechanization has been the increase in the proportion of cropland and of cotton acreage operated with wage labor.[11] The extent to which these developments may proceed will depend in large part upon the relative economy of using animal or mechanical power, and wage labor or share labor. These alternatives are analyzed in detail later in this bulletin.

### PLANTATION INVESTMENT

The average investment per plantation during these 5 years amounted to $59,696, or an average of approximately $81 per acre of cropland. Of this total investment, approximately 89 percent was taken up in land and improvements, 3 percent in work stock and saddle horses, 4 percent in machinery and equipment, and 4 percent in feed and seed. A summary of the average investment in these plantations is shown in table 14. The value of the owner's residence, or of the manager's residence if the manager was the responsible operator of the plantation, was not included in the plantation investment. Tenant houses and buildings were numerous in relation to the acreage in share-rented land, as illustrated in figure 5, and constituted an important part of the average plantation investment. Miscellaneous supplies and the plantation automobile, or the part of the personal-automobile investment chargeable to the plantation business, are not included in the plantation investment. Miscellaneous supplies such as poison, cotton-picking sacks, hoes, and files were classed as operating expenses when purchased. The part of the automobile expense chargeable to the plantation business also was included as an operating expense.

In estimating the investment in the plantation business, items other than those used currently or held for sale were valued at rather constant levels after allowing for depreciation. Land of comparable grades was valued at approximately the same price on different plantations and as between different years of the study. Values of work stock originally on hand were maintained at approximately their 1932 level after allowing for appreciation or depreciation due to changes in age and condition. Values of improvements originally on hand were estimated in the same way. Livestock purchases and new improvements were valued at cost. Feed, seed, and other commodities used currently or held for sale were valued at current market prices.

[11] For a further discussion see section beginning with p. 52.

TABLE 14.—*Investment per plantation and per acre of cropland, and proportion of total investment in various items, 1932–36*

| Item | 1932 | 1933 | 1934 | 1935 | 1936 | 5-year average 1932–36 |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Plantations studied | 24 | 28 | 28 | 20 | 22 | 24 |
| Acres per plantation: | | | | | | |
| Cropland | 750 | 699 | 735 | 740 | 768 | 738 |
| Other improved land [1] | 61 | 82 | 95 | 80 | 82 | 82 |
| Woodland and waste | 123 | 118 | 104 | 105 | 95 | 109 |
| | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Investment per plantation: | | | | | | |
| Improved land [2] | 40,550 | 39,050 | 41,500 | 41,500 | 42,500 | 41,020 |
| Woodland and waste | 1,845 | 1,770 | 1,560 | 1,575 | 1,425 | 1,635 |
| Real estate improvements: | | | | | | |
| Headquarters improvements (excluding owner's or manager-operator's residence) | 1,808 | 2,007 | 1,980 | 2,004 | 2,100 | 2,016 |
| Cotton houses | 316 | 365 | 384 | 331 | 316 | 342 |
| Tenant houses and other improvements | 7,825 | 8,107 | 8,372 | 8,059 | 8,489 | 8,186 |
| Livestock: | | | | | | |
| Work stock | 1,887 | 1,883 | 1,946 | 2,011 | 2,107 | 1,967 |
| Saddle horses | 60 | 53 | 69 | 72 | 72 | 65 |
| Machinery and equipment: | | | | | | |
| Tractors and tractor equipment | 1,649 | 951 | 920 | 910 | 1,419 | 1,170 |
| Mule-drawn equipment | 1,199 | 1,206 | 1,178 | 1,016 | 1,050 | 1,130 |
| Feed and seed | 1,102 | 1,703 | 2,017 | 2,878 | 3,126 | 2,165 |
| Total investment | 58,241 | 57,185 | 59,926 | 60,450 | 62,674 | 59,696 |
| Investment per crop acre | 77.65 | 81.81 | 81.53 | 81.70 | 81.61 | 80.89 |
| | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| Proportion of total investment in— | | | | | | |
| Land and improvements | 80.9 | 80.8 | 80.8 | 86.6 | 87.6 | 80.1 |
| Work stock and saddle horses | 3.3 | 3.4 | 3.3 | 3.4 | 3.5 | 3.4 |
| Machinery and equipment | 4.9 | 3.8 | 3.5 | 3.2 | 3.9 | 3.9 |
| Feed and seed | 1.9 | 3.0 | 3.4 | 4.8 | 5.0 | 3.6 |

[1] Idle cropland, permanent pasture, orchards, roads, ditches, and land occupied by farmsteads.
[2] Cropland and other improved land.

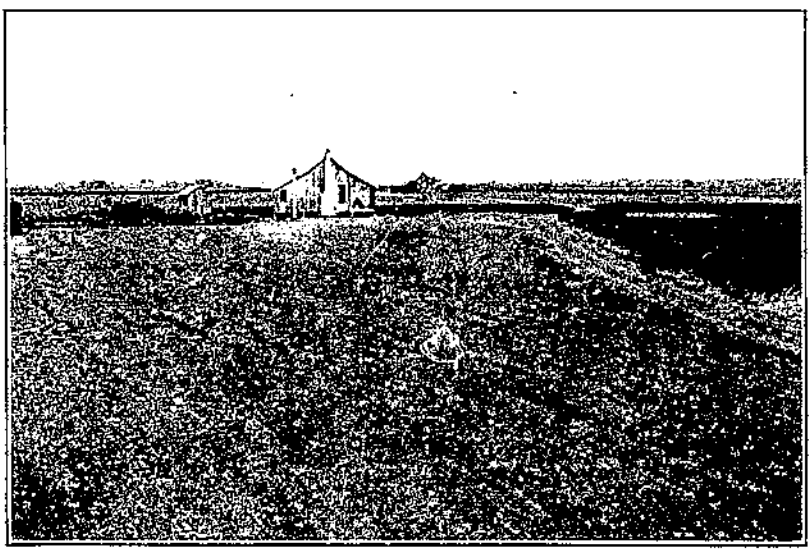

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FIGURE 5.—Tenant houses on a cotton plantation in the Delta area. The crop acreage usually operated by a tenant is small, hence tenant home sites are numerous in relation to the acreage in share-rented land. The investment in and repairs of tenant houses and buildings are important items in the plantation investment and expenses.

### GROSS PLANTATION INCOME

Gross plantation income includes cash receipts and increases in the value of feed and seed on hand at the end of the year over that at the beginning of the year. The average gross income per plantation during the 5 years amounted to $26,179, or approximately $35 per crop acre. Of this income, 99 percent was derived from cash sales and 1 percent from increased inventories of feed and seed (table 15).

TABLE 15.—*Gross income from cash receipts and increases in inventories, per plantation and per crop acre, and proportion of cash receipts from various sources, 1932–36* [1]

| Item | 1932 | 1933 | 1934 | 1935 | 1936 | 5-year average 1932–36 |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Plantations studied | 24 | 26 | 26 | 20 | 22 | 24 |
| Crop acres per plantation | 759 | 699 | 737 | 740 | 768 | 738 |
| Gross income per plantation: | | | | | | |
| Cash receipts: | | | | | | |
| Cotton and related receipts: | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Cotton lint | 8,061 | 16,552 | 16,730 | 18,774 | 27,701 | 17,772 |
| Cottonseed, commercial | 1,751 | 2,444 | 4,444 | 5,274 | 7,734 | 4,329 |
| Surplus cotton-planting seed | 78 | 95 | 236 | 282 | 191 | 176 |
| A. A. A. payments | | 2,417 | 2,476 | 2,282 | 1,995 | 1,834 |
| Bankhead certificates | | | 98 | 85 | | 37 |
| Feed sales: | | | | | | |
| Corn | 61 | 109 | 175 | 306 | 148 | 155 |
| Hay | 122 | 185 | 287 | 292 | 378 | 253 |
| Other feed | 4 | 17 | 196 | 11 | 88 | 63 |
| Other receipts: | | | | | | |
| Cash rent, land and equipment | 178 | 240 | 133 | 136 | 229 | 183 |
| Work done for tenants | 30 | 34 | 1 | 84 | 136 | 57 |
| Collections from tenants on old accounts | 233 | 327 | 123 | 57 | 63 | 161 |
| Tenant supervision, commissions, and interest | 464 | 835 | 930 | 686 | 824 | 749 |
| Miscellaneous | 137 | 175 | 174 | 127 | 196 | 150 |
| Total | 12,119 | 23,427 | 25,983 | 28,306 | 39,628 | 25,893 |
| Increases in inventories (feed and seed) | 80 | 16 | 1,037 | 0 | 298 | 286 |
| Total, gross plantation income | 12,199 | 23,443 | 27,020 | 28,306 | 39,926 | 26,179 |
| Gross plantation income per crop acre | 16.27 | 33.54 | 36.76 | 38.25 | 51.99 | 35.47 |
| Proportion of cash receipts from— | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| Cotton and related receipts | 89.9 | 91.8 | 92.3 | 94.0 | 94.9 | 93.2 |
| Feed sales | 1.5 | 1.3 | 2.5 | 2.2 | 1.6 | 1.8 |
| Other receipts | 8.6 | 6.9 | 5.2 | 3.8 | 3.5 | 5.0 |

[1] Plantation operator's share of income except for cotton lint and seed, which include also all of the tenants' shares, purchased by the operator as shown in table 17.

The predominant position of the cotton enterprise on the plantations is shown by the fact that an average of about 93 percent of the cash receipts on those studied was derived from sales of cotton lint and seed, and from payments obtained for participating in the cotton-adjustment programs of the Agricultural Adjustment Administration. Of the total cash receipts, approximately 2 percent was derived from the sale of surplus feed, and 5 percent from other sources.

The income from cotton and cottonseed includes the tenants' shares as well as the plantation operator's part of the cotton grown. This is in keeping with the usual plantation practice whereby the operator purchases the tenants' shares of the cotton crop at current market prices as a basis for settling the tenants' credit accounts. The value of the tenants' crops purchased is shown as a plantation expense in table 17. The other items in the two tables pertain only

to the plantation operator's receipts and expenses. An account of the tenants' receipts and expenses is given later.[12]

Cash benefits obtained for participating in the cotton-adjustment programs of the Agricultural Adjustment Administration constituted an important part of plantation receipts from 1933 through 1936. Some income also was derived from the sale of tax-exemption certificates obtained in connection with the Bankhead Cotton Act, which was administered by the Agricultural Adjustment Administration and in operation in 1934 and 1935. Under the terms of that act, each plantation was allotted tax-exemption certificates to cover a specified quota of cotton that could be ginned and marketed without tax penalty. A few plantation operators produced less than their quotas, and sold surplus certificates.

Incomes received for participating in the programs of the Agricultural Adjustment Administration were credited to the particular years in which adjustments were made, even if payments actually were received only in subsequent years. Likewise, speculative gains or losses from holding cotton from one year to another were eliminated for the purposes of this study, by considering such cotton as sold during the marketing season of the year when it was grown. In the case of cotton entered in the loan program of the Government, the selling price used represented either the market price for which such cotton could have been sold or the amount of the producer's loan, depending upon which was the larger.

Cash receipts other than from cotton and feed sales were derived chiefly from tenant transactions. Of these, the most important were commissions and interest on credit advanced to tenants, and tenant supervision. Charges also were made for tractor or other special work performed by the plantation operator on the tenants' crops. These income items derived from tenant transactions comprised only 3 percent of the total plantation cash receipts.

The annual average gross income per plantation ranged from $12,199 in 1932 to $39,926 in 1936, or from about $16 to $52, respectively, per crop acre. These variations in average gross earnings as between individual years were caused primarily by changes in the proportions of the cropland planted to cotton and to other crops, by differences in yields, by changes in prices, and by differences in payments received for participating in the adjustment programs. The situation in respect to the acreage and yields of various crops during individual years of the study was discussed in connection with tables 8 and 10, respectively. The prevailing prices received for the major crops sold are shown in table 16 for each year of the study.

TABLE 16.—*Prices per unit received for principal products sold, 1932–36*

| Item | | 1932 | 1933 | 1934 | 1935 | 1936 |
|---|---|---|---|---|---|---|
| | | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Cotton lint | pound | 0.074 | 0.121 | 0.140 | 0.121 | 0.141 |
| Cottonseed, commercial | ton | 14.50 | 18.00 | 38.00 | 37.00 | 39.00 |
| Surplus cotton-planting seed | do | 22.00 | 28.00 | 28.00 | 46.00 | 13.00 |
| Corn | bushel | .45 | .60 | .70 | 1.00 | .99 |
| Legume hay (baled) | ton | 9.00 | 13.00 | 18.00 | 16.00 | 16.00 |

[12] See section beginning on p. 42.

### GROSS PLANTATION EXPENSES

Average gross expenses per plantation and per crop acre are shown in table 17 for each year and for the 5 years of the study. Gross expenses, including cash expenses, depreciation, and decreases in inventories of feed and seed, averaged $18,159 per plantation, or about $25 per crop acre during the period. The average proportions of the gross expenses comprised in these three classes of items were approximately 91, 8, and 1 percent, respectively.

TABLE 17.—*Gross expenses for cash items, depreciation, and decreases in inventories, per plantation and per crop acre, and proportion of cash expenses for various items, 1932–36*[1]

| Item | 1932 | 1933 | 1934 | 1935 | 1936 | 5-year average 1932–36 |
|---|---|---|---|---|---|---|
| Plantations studied | Number 24 | Number 26 | Number 28 | Number 30 | Number 22 | Number 24 |
| Crop acres per plantation | 774 | 696 | 777 | 740 | 768 | 738 |
| Gross expenses per plantation: | | | | | | |
| Cash expenses | | | | | | |
| Labor, power, and equipment: | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| Wages of labor | 1,140 | 1,017 | 1,028 | 1,286 | 1,887 | 2,181 |
| Tractor fuel, oil, repairs, and hired power: | | | | | | |
| Tractor power[2] | 1,402 | 1,138 | 1,730 | 1,537 | 1,465 | 1,456 |
| Horsepower[3] | | 1,174 | 1,179 | 1,429 | 1,760 | |
| Fuel, oil, and repairs for automotive equipment | 484 | 402 | 624 | 813 | 826 | 638 |
| Rent for machinery and equipment | 284 | 260 | 413 | 727 | 746 | 392 |
| Feed for work stock | 174 | 207 | 409 | 130 | 143 | 221 |
| Auto for hire | 248 | 274 | 302 | 305 | 373 | 296 |
| Miscellaneous operating expenses: | | | | | | |
| Seed, fertilizer, and poison | 477 | 464 | 487 | 1,286 | 1,361 | 875 |
| Containers, boxes, baskets, etc. | 163 | 162 | 184 | 77 | 116 | 116 |
| Irrigation, and Mississippi levee taxes[4] | 768 | 807 | 811 | 1,138 | 1,760 | 1,094 |
| Real estate and other taxes: | | | | | | |
| Repairs, buildings, and improvements | 371 | 287 | 366 | 471 | 611 | 393 |
| Insurance | 177 | 144 | 141 | 213 | 207 | 162 |
| Taxes | 1,208 | 1,240 | 1,222 | 1,611 | 1,714 | 1,513 |
| Interest on operating expenses | 313 | 238 | 280 | 281 | 265 | 272 |
| Unpaid rent on cash farms | 36 | 28 | 47 | 147 | 79 | 95 |
| Miscellaneous | 270 | 208 | 261 | 335 | 349 | 277 |
| Total | 7,084 | 6,797 | 7,693 | 10,424 | 12,685 | 10,384 |
| Depreciation: | | | | | | |
| Work stock | 472 | 437 | 473 | 506 | 480 | 470 |
| Motor-drawn equipment | 233 | 206 | 242 | 228 | 227 | 226 |
| Tractors and equipment[5] | 327 | 330 | 348 | 392 | 357 | 373 |
| Buildings | 363 | 379 | 334 | 316 | 372 | 325 |
| Total | 1,394 | 1,371 | 1,447 | 1,538 | 1,616 | 1,496 |
| Decreases in inventories, feed and seed | 0 | 220 | 0 | 174 | 0 | 79 |
| Total gross plantation expenses | 18,784 | 15,361 | 18,722 | 26,026 | 25,301 | 18,159 |
| Gross expense per crop acre | 27.45 | 21.48 | 27.20 | 27.46 | 32.91 | 24.61 |
| Proportion of cash expenses for— | Percent | Percent | Percent | Percent | Percent | Percent |
| Labor, power, and equipment | 63.7 | 72.7 | 72.4 | 79.1 | 74.1 | 71.0 |
| Miscellaneous operating expenses | 12.1 | 10.1 | 12.3 | 14.8 | 12.9 | 12.6 |
| Real estate and other taxes[6] | 22.3 | 15.9 | 13.6 | 13.9 | 12.1 | 14.7 |
| Miscellaneous | 1.9 | 1.3 | 1.7 | 1.2 | 1.0 | 1.7 |

[1] Plantations operated a full year and for which complete data were obtained for the years studied. Data for these plantations are not representative of trends in all plantations in the area.

[2] Tractors and other power units used on crops and pre-harvest crops. Data for these 2 types of tractors not obtained separately in 1932.

[3] Plantation proportion of power-unit expenses not traceable to plant operations.

[4] Expenses for Mississippi levee assessments and certificates were $82 in 1934 and $210 in 1935.

[5] Interest at 6 per cent per annum on funds borrowed or owned, used in production operations and on material advances to tenants.

An average of almost three-fourths of the cash expenses on the plantations was for labor, power, and equipment used in crop production. The largest item in this category was the value of the tenants' shares of cotton lint and seed purchased by the plantation operator as explained in connection with table 15. This item, in effect, represents the amount paid by the plantation operator for the labor and cash items contributed by sharecroppers, and for the labor, power, and other items contributed by share tenants in producing cotton. As in the case of receipts in table 15, the other items in table 17 represent the operator's share of expenses incurred in operating the plantation. The largest items of cash expense other than tenant-cotton purchases were for wage labor; taxes; cotton ginning; seed, fertilizer, and poison; tractor expenses; and repairs on mule-drawn equipment. Expenses for the purchase of capital items such as tractors, the construction of buildings and improvements, and others were not included as current cash expenses, but depreciation on these items was classed as an expense.

The average gross expense per plantation ranged from $11,584 in 1932 to $25,301 in 1936, or from approximately $15 to $33, respectively per crop acre. These variations in average gross expenses from year to year were influenced by changes in the volume of production and in the quantities of materials and other expense items used in plantation operation, and by changes in prices paid and received. Changes in cotton prices were reflected in differences in the expenses incurred in buying the tenants' shares of the cotton produced. The differences in the volume of crops harvested each year have been discussed in connection with tables 8 and 10, in which are shown the average acreages and yields, respectively, of the various crops during the individual years. Information on prices received is shown in table 16. Data on prices paid for items purchased are shown in table 18.

TABLE 18. *Prices per unit paid for labor, materials, and services, 1932–36*

| Item | 1932 | 1933 | 1934 | 1935 | 1936 |
|---|---|---|---|---|---|
| | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Wage labor: | | | | | |
| Cotton chopping per day | 0.50 | 0.50 | 0.60 | 0.75 | 0.75 |
| Cotton picking per hundredweight [1] | .50 | .60 | .75 | .75 | 1.00 |
| Other wage labor per day | .60 | .60 | .75 | 1.00 | 1.00 |
| Ginning per hundredweight [1] | .25 | .30 | .30 | .30 | .30 |
| Bagging and ties per bale | 1.25 | 1.25 | 1.50 | 1.50 | 1.50 |
| Planting seed: | | | | | |
| Cotton per ton | 30.00 | 33.00 | 35.00 | 72.00 | 33.00 |
| Alfalfa per hundredweight | 12.50 | 13.75 | 20.75 | 19.50 | 26.50 |
| Soybeans (small-seed varieties) per bushel | 2.00 | 3.00 | 3.50 | 3.50 | 3.50 |
| Soybeans (large-seed varieties) per bushel | [2] | [2] | 2.50 | 2.25 | 2.10 |
| Austrian Winter peas per hundredweight | 5.65 | 6.25 | 5.50 | 5.50 | 4.50 |
| Hungarian vetch per hundredweight | [2] | [2] | 7.50 | 6.60 | 5.40 |
| Sagrain per hundredweight | 5.00 | 5.00 | 5.00 | 6.00 | 6.00 |
| Feed: | | | | | |
| Ear corn per bushel | .40 | .60 | .70 | 1.00 | .95 |
| Oats per bushel | .25 | .50 | .60 | .70 | .50 |
| Legume hay per ton | 11.00 | 12.00 | 16.00 | 15.00 | 13.00 |
| Tractor gasoline per gallon | .11 | .10 | .12 | .12 | .13 |
| Tractor oil per gallon | .60 | .50 | .50 | .55 | .60 |
| Fertilizer (nitrogenous) per ton | 26.00 | 28.00 | 29.00 | 33.00 | 31.00 |
| Poison (calcium arsenate) per ton | 114.00 | 108.00 | 112.00 | 122.00 | 125.00 |

[1] Hundredweight of seed cotton.
[2] No reports.

Cash expenses varied more widely from year to year than did depreciation and decreases in feed and seed inventories. The low incomes obtained in 1932 and the prospectively low returns in 1933 were

reflected in relatively small outlays for fertilizer, poison, and machinery and building repairs during these 2 years. Furthermore, feed production was increased so as to reduce cash expenses for feed purchases. In 1933, cash production expenses were also relatively low because of the reduced outlay for materials and services on the acreage in cotton plowed under in cooperation with the Agricultural Adjustment Administration.

With increased prices both of cotton and of purchased items after 1932, however, gross expenses per plantation and per crop acre increased rapidly. The increased value of the tenants' shares of the cotton crop resulted in an increase in the plantation operator's cash outlay for the tenants' labor, materials, power, and equipment used on share crops. Expenses for the repairs of buildings, improvements, and machinery and equipment also increased sharply, and an upward trend was noted in depreciation as a result of increased capital expenses for new equipment.

Collections of tenant credit accounts were generally favorable during the period. Although losses occurred each year, they were more than offset, on the average, by collections of old accounts. This favorable situation regarding collections resulted from the drastic curtailment in tenant credit advances in 1932 and 1933, in keeping with low or prospectively low cotton prices and incomes, and from the relatively favorable incomes during the last 4 years of the study.

### PLANTATION FINANCIAL SUMMARY

The situation in respect to the average investment, income, and expenses per plantation and per crop acre during each year and for the 5 years of the study is shown in table 19. As indicated in the last column of the table for the 5-year period, the average investment per plantation amounted to $50,696. In the use of this investment, expenses averaging $18,159 were incurred and receipts averaging $26,179 were obtained, leaving an average net plantation income of $8,020. A summary of these items per acre of cropland is shown in the last section of the table. The net plantation income represents the average amount that the operator received for the use of his plantation and for his management.

TABLE 19.—*Financial summary per plantation and per crop acre, 1932–36*

| Item | 1932 | 1933 | 1934 | 1935 | 1936 | Average 5 years |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Plantations studied | 24 | 26 | 26 | 24 | 22 | 24 |
| Crop acres per plantation | 778 | 699 | 735 | 740 | 768 | 738 |
| Financial summary per plantation | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Investment | 58,241 | 47,187 | 50,026 | 60,174 | 42,674 | 50,696 |
| Gross income | 14,596 | 20,445 | 27,029 | 28,850 | 31,928 | 26,179 |
| Gross expenses | 11,284 | 15,301 | 18,722 | 20,120 | 27,403 | 18,159 |
| Net income | 3,312 | 5,082 | 8,198 | 8,280 | 4,625 | 8,020 |
| Financial summary per crop acre | | | | | | |
| Investment | 77.63 | 81.84 | 82.76 | 84.70 | 82.64 | 80.96 |
| Gross income | 19.47 | 34.74 | 36.79 | 38.87 | 41.70 | 37.37 |
| Gross expenses | 15.05 | 24.08 | 27.30 | 27.96 | 42.91 | 24.44 |
| Net income | 4.42 | 10.76 | 11.16 | 10.91 | 10.87 | 10.87 |

Return to plantation management and to inventory investment in real estate, livestock, machinery and equipment, feed, and seed.

As each of the major items of plantation investment, income, and expenses has now been considered, the discussion here is limited to a summary of the major factors that caused differences in average net plantation incomes as between the individual years.

Variations in average net plantation incomes as between different years were influenced primarily by differences in the proportions of cropland planted to cotton and to other crops, in yields obtained, in quantities of materials and other items used in production, in prices paid and received, and in payments received for participating in the adjustment programs of the Agricultural Adjustment Administration. In 1932, an average of 72 percent of the cropland on the plantations studied was in cotton, but a combination of extremely low cotton prices and of an average cotton yield approximately 35 percent below the 5-year average (1932–36) resulted in the lowest plantation returns obtained during the period. Although average production expenses were the lowest of any year in the period studied, the net plantation income averaged only $615, or 82 cents per crop acre.

Following the governmental cotton-reduction program of 1933, an average of only 52 percent of the cropland in the plantations studied remained in cotton. The average yield of cotton was 8 percent above the average for the 5 years of the study, however, and cotton prices on these plantations were 64 percent higher than in 1932. Substantial payments also were received for cooperating in the cotton-reduction program of that year, and harvesting and ginning expenses were eliminated for the cotton that was destroyed. Receipts increased much more rapidly, proportionately, than did expenses, and the net plantation income that year averaged $8,082, or about $12 per crop acre—a situation vastly different from that in 1932.

In 1934, an average of 53 percent of the cropland was in cotton. As compared with the situation in 1933, higher prices were obtained for cotton and other crops, and larger total payments were received for participating in the program of the Agricultural Adjustment Administration. These more favorable conditions as compared with 1933 were offset in part, however, by lower yields of cotton and by higher expenses. The average net plantation income per crop acre on the plantations studied were exactly the same for the 2 years.

The average net incomes of $8,280 per plantation and of approximately $11 per crop acre in 1935 were lower than the average returns obtained in 1934. The proportion of the cropland in cotton was slightly larger than in 1934, and more favorable yields of cotton were obtained. But lower prices of cotton and other crops were associated with increased prices of cost items, higher operating expenses, and somewhat lower receipts for participating in the adjustment program.

The highest returns per plantation and per crop acre were obtained in 1936. Approximately 57 percent of the cropland was in cotton that year as compared with the low points of 52 and 53 percent harvested in 1933 and 1934, respectively. Some of the plantations were not entered in the conservation program of 1936, and smaller average payments were received from the Agricultural Adjustment Administration that year than during the preceding 3 years. The relatively high proportion of the cropland in cotton was associated with an average yield of cotton that was 28 percent above the 5-year average, and with the highest average prices of cotton lint and seed received during the study. Operating expenses did not increase so rapidly,

proportionately, as did receipts. An average net plantation income of $14,625 or approximately $19 per crop acre, was obtained.

### VARIATIONS IN PLANTATION EARNINGS

The preceding pages have served to explain the average level of earnings on all plantations as between different years of the study. A wide variation also occurred in the earnings among plantations during each year, with the widest range occurring during years of relatively favorable average incomes. This is shown graphically in figure 6,

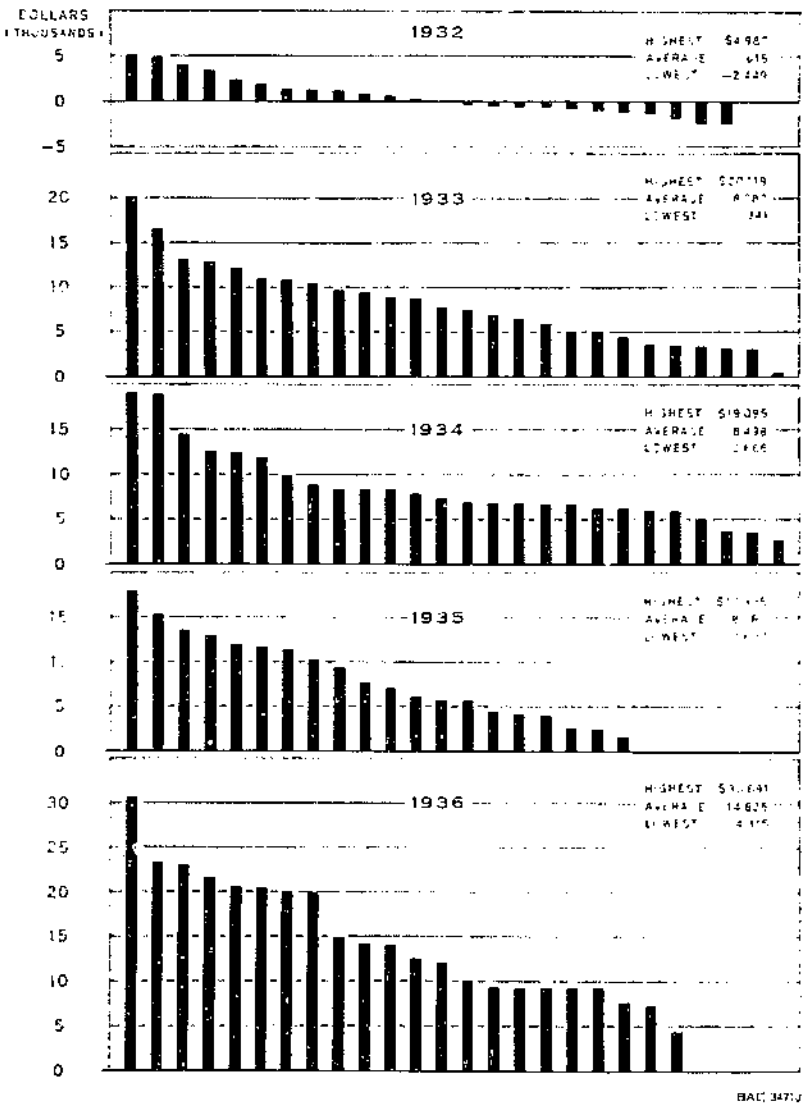


FIGURE 6. Variations in net plantation income by years, 1932 36. Each bar represents the income of one plantation. The highest, lowest, and average incomes for each year are also shown.

in which individual plantations are arrayed according to the net plantation income obtained each year. The highest, lowest, and average net plantation incomes during each year are also indicated in the chart. In 1932, for example, expenses exceeded receipts on 12 of the 24 plantations studied. The range from lowest to highest individual plantation earnings that year extended from $4,987 on one plantation to a net loss of $2,449 on another, a difference of $7,436. In none of the other years of the study did receipts on individual plantations fail to exceed expenses, but the differences in earnings among plantations were very wide.

The limited number of plantations studied and the wide variations in sizes and organizations of individual units do not permit a statistical determination of the extent to which various factors caused differences in plantation earnings. A careful study of individual plantation records shows that the most important factors influencing variations in earnings apparently were differences in the area in crops, in the proportion of the cropland in cotton and in other crops, in crop yields, in the types of labor and power used, and in general expenses of production. Prices received for cotton also varied slightly as between plantations. Together with these factors were differences in the payments received among plantations for participating in the Agricultural Adjustment Administration programs during the last 4 years studied.

During each year of the study, size of plantation measured in acres of cropland was an important factor influencing earnings. In 1932, a year of generally low earnings or of unprofitable operations, the large plantations tended to be disadvantaged as compared with the smaller units. Of the 12 plantations with the highest net plantation incomes in 1932, only 4 were above average in size, and the heaviest losses occurred on 2 of the largest plantations. In each of the 4 following years, plantation operation was relatively profitable as compared with 1932, and approximately two-thirds of the plantations with earnings above average were also above average in size.

The highest incomes during each of these 4 years were obtained on plantations considerably above average in size. That the other factors mentioned also were significantly related to earnings is indicated by the fact that during each year earnings varied widely both on small and on large plantations. In 1932, for example, the plantation with the third highest net income was considerably above average in size; in 1936, the year of highest average earnings, the plantation with the third highest earnings was materially below average in size.

In order to note the influence of factors other than size on variations in plantation earnings, and to determine the relative income ranking of individual plantations over a period of years, a detailed study was made of 12 plantations for which 5-year records are available. The situation regarding earnings on the 12 plantations for each year of the study is shown graphically in figure 7 in terms of the net plantation income per crop acre. These plantations are well representative of the larger number studied each year; the major factors other than size that accounted for variations in earnings were substantially the same for both groups.

The influence of size on net plantation income is largely eliminated when earnings are expressed on a crop-acre basis; that is, there was no tendency for incomes and expenses per crop acre to vary materially

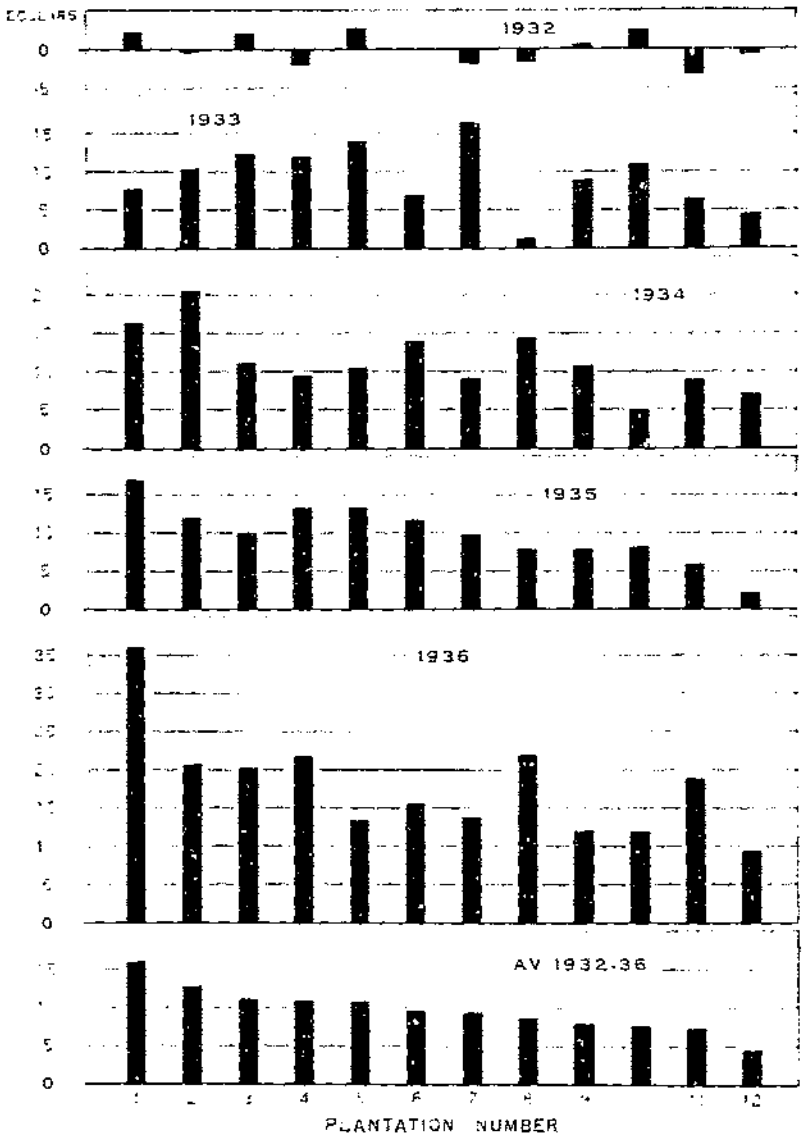


FIGURE 7.— Variations in net plantation incomes per crop acre of 12 plantations with 5-year records, by years for the 5-year period 1932-36. Each bar represents the net plantation income per crop acre for one plantation. The plantations are ranked in the bottom section of the chart according to their relative average incomes per crop acre for the 5-year period, and the income per crop acre for each plantation is shown above for individual years.

because of differences in size only. The plantations are arrayed in the graph according to the average net plantation incomes per crop acre obtained during the 5-year period. To prevent the identification of individual operations, the numbers assigned the plantations in the

graph are different from the record numbers used in making annual reports to cooperators during the period.

### VARIATIONS IN AVERAGE EARNINGS AMONG PLANTATIONS

The plantations with the highest average earnings per crop acre were those with a relatively high proportion of their cropland in cotton, and with high cotton yields produced at relatively low cost. Low costs per crop acre were associated with the use of wage labor and mechanical power on a substantial part of the acreage in cultivation. The operator's share of benefit payments received for participating in the adjustment programs constituted an important element in plantation receipts during the last 4 years of the study. In general, however, the average payments per acre in cropland on the plantations were not greatly different, and consequently were not a major cause of differences in earnings among plantations.

The influence of the major factors influencing plantation earnings during the period may be illustrated with the situations on plantations 1, 7, and 12, on which the average earnings per acre for the 5-year period were highest, medium, and lowest, respectively; hence, the discussion will be simplified by considering only these three representative cases (fig. 7).

The net plantation income per crop acre during the 5-year period amounted to $15.87 on plantation 1 as compared with $9.51 on plantation 7, and with $4.50 on plantation 12. On plantation 1, an average of 58 percent of the cropland was in cotton during the 5 years, and cotton yields averaged 384 pounds of lint per acre. Approximately 32 percent of the cotton acreage was operated with wage labor, tractors supplied 62 percent of the total power used, and power and equipment costs amounted to $5.88 per crop acre.[13] On plantation 7, a high average yield of 452 pounds of lint cotton was obtained per acre, but only 42 percent of the cropland was in cotton. Although 29 percent of the cotton acreage was operated with wage labor, only 39 percent of the power was furnished by tractors, and power and equipment costs averaged $7.96 per crop acre. Plantation 12 had 60 percent of its cropland in cotton, but yields averaged only 320 pounds per acre, and only 9 percent of the crop acreage was operated with wage labor. Approximately 16 percent of the power was furnished by tractors, and power and equipment costs averaged $8.94 per crop acre.

The importance of these factors in explaining the relative earnings among plantations is brought out in more detail later in this bulletin. Under the average price and production conditions that prevailed during the period, cotton returned a higher net income per acre than any other important enterprise on the plantations. Consequently, the plantations with a high proportion of cropland in cotton were in a relatively favorable income position, provided that cotton yields also were economically maintained. On the expense side, cotton prices and incomes increased to a relatively higher level after 1932 than did wage rates, and, on the average for the period, it was less expensive for the plantation operator to use wage labor in producing cotton than to share the production with tenants. The use of tractors and large-scale

[13] Power and equipment costs include the value of feed fed to work stock, and expenses for hostler, veterinary, and miscellaneous items used on work stock; the value of tractor fuel and lubricants; repairs on tractors and equipment; and depreciation on work stock, *tractors*, and *equipment*. These costs are expressed on a per-acre basis for the land operated with wage labor and sharecroppers.

equipment in conjunction with wage labor also resulted in lower average power and equipment costs per acre than did the use of mule power, chiefly because of the relatively high prices for feed that prevailed during the last 3 years of the study.

### VARIATIONS IN EARNINGS ON IDENTICAL PLANTATIONS

That there is a wide variation in the earnings on individual plantations over a period of years is also indicated in figure 7. The relative income ranking of individual plantations during different years also varied materially. These changes in relative income rankings were caused by variations in prices and in climatic and other conditions that affected production and earnings differently on various plantations, and by changes in plantation organizations and production practices. The sharp increase in practically all prices following 1932 resulted in differences in relative earnings per crop acre on plantations with different combinations of cotton and feed crops. Conditions such as rainfall and disease and insect damage also varied as between plantations during the same year. Furthermore, a given amount of rainfall may affect yields differently on various plantations because of differences in soils or in land preparation, as well as in the varieties of crops grown. Combined with these factors were changes from year to year on individual plantations in the types of labor and power used, or in other phases of plantation organization.

A discussion of the factors causing differences in the relative income rankings of plantations 1 and 12 during the period will serve to illustrate the influence of certain of these factors. As indicated in figure 7, the highest and lowest average net plantation incomes per crop acre during the 5-year period were obtained on plantations 1 and 12, respectively.

Cropland organizations on plantations 1 and 12 were fairly similar during each year of the study. In 1932, each of these plantations had approximately three-fourths of its cropland in cotton. Heavy reductions were made in 1933, 1934, and 1935 in cooperation with the adjustment programs, but by 1936 the proportions of the cropland in cotton had been increased again to slightly over 60 percent on each plantation. The net income per crop acre on the two plantations did not differ greatly in 1932 and 1933, but the difference became increasingly large in subsequent years. In 1936 the net plantation income per crop acre on plantation 1 was almost $27 larger than on plantation 12. As between these two plantations, the sharp increases in earnings on the former were caused chiefly by materially increased cotton yields during the last 3 years of the study, and by relatively low labor, power, and equipment costs during all 5 years.

Cotton yields on plantation 1 increased from approximately 250 pounds of lint per acre in 1932 and 1933 to 333 in 1934, 434 in 1935, and 641 pounds in 1936. Cotton yields on plantation 12 did not depart widely from their 5-year average of 320 pounds except in 1934, when a yield of only 234 pounds was obtained. This relatively low cotton yield on plantation 12 in 1934 was caused by heavy rainfall that delayed land preparation and cotton planting, and interfered with replanting operations on land with poor stands.

Although other factors undoubtedly were present, the increased yields on plantation 1 during the last 3 years of the study were asso-

ciated with increases in the use of commercial fertilizers and in the acreage of legumes turned under; in 1932, none of the cotton acreage on this plantation was fertilized or preceded by winter legumes turned under, but from 1933 to 1936 the proportions of the cotton acreage so treated increased steadily from 12 to 75 percent, respectively.

On plantation 12, on the other hand, no fertilizer was used on cotton during the period of the study, and the acreage in cotton preceded by winter legumes was negligible. A relatively small acreage of soybeans grown in corn was turned under every year on both plantations.

Costs of labor, power, and equipment are the most significant items in plantation expenses, and affected materially the relative earnings on plantations 1 and 12 during the last 4 years of the study. As already indicated, an average of 32 percent of the cotton acreage on plantation 1 was operated with wage labor, and 62 percent of the power was furnished by tractors. Comparable data for plantation 12 were 9 and 16 percent, respectively. In 1932, the labor and power costs per crop acre were not greatly different on the two plantations. But during the next 4 years, these costs were relatively much higher on plantation 12 than on plantation 1. The relatively lower costs on plantation 1 resulted chiefly from price and yield changes that favored the use of wage labor and tractor power more than the use of share labor and animal power.

## SHARECROPPERS AND SHARE TENANTS ON PLANTATIONS [14]

The importance of tenancy on plantations and in the area generally has already been indicated. Information on the economic situation of share tenants and sharecroppers on the plantations studied are now presented, and general consideration is given to the factors affecting tenant earnings. The discussion is limited to sharecroppers and share tenants--the major forms of tenancy found on the plantations studied and in the area generally. Cash tenants and standing-rent tenants not only are relatively limited in number but are somewhat in a class apart in that they usually receive little or no supervision and have much the same prerogatives as do owner operators. Sharecroppers and share tenants on plantations, on the other hand, usually are as closely supervised in their work as are wage laborers.

### LAND ORGANIZATION AND CROP PRODUCTION PER TENANT FAMILY

Data on the acreage and production of crops per family of sharecroppers and share tenants on the plantations studied are shown in table 20. Data were obtained for 5 years for sharecroppers and for 4 years for share tenants. Cotton and corn were practically the only crops grown. A few tenants also produced hay, but the average acreage per family for all tenants was so small as to be insignificant. The average crop acreage per cropper family during the 5 years ranged from 16 acres in 1932 and 1933 to 13 acres in 1936. The average crop acreage per share-tenant family during the 4-year period 1933-36 remained rather constant at approximately 21 acres. The decrease in the cotton acreage per family after 1932 resulted principally from participation in the governmental adjustment programs. There was

[14] For definitions of various tenant classes, see section beginning on p. 4.

a tendency for reductions in cotton acreage to be offset by increases in the acreage in corn.

TABLE 20.—*Cropland organization, crop production, and share of production available for sale and for farm use, per tenant family, 1932–36*

| Item | Sharecroppers | | | | | Share tenants [1] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1932 [2] | 1933 | 1934 | 1935 | 1936 | 1933 | 1934 | 1935 | 1936 |
| Plantations studied ..... number | 24 | 26 | 26 | 20 | 22 | 26 | 20 | 20 | 22 |
| Plantations with tenants ..... do | 20 | 23 | 23 | 17 | 19 | 16 | 13 | 10 | 9 |
| Tenant families on plantations ..... do | [3] 117 | 625 | 651 | 456 | 525 | 93 | 72 | 43 | 42 |
| Persons per tenant family ..... do | 3.8 | 3.5 | 3.5 | 3.6 | 3.4 | 4.4 | 4.2 | 3.8 | 3.8 |
| Workers per tenant family [3] ..... do | 2.9 | 2.8 | 2.8 | 2.9 | 2.7 | 3.4 | 3.3 | 3.0 | 3.0 |
| Cropland per tenant family: | | | | | | | | | |
| Cotton (share rent) ..... acres | 13.4 | [4] 14.0 | 10.4 | 11.2 | 10.8 | [5] 18.1 | 14.3 | 13.6 | 14.5 |
| Corn (share rent) ..... do | 1.9 | 1.3 | 3.6 | 3.5 | 1.8 | 1.1 | 1.8 | 1.7 | 2.5 |
| Corn (cash rent) ..... do | .5 | .6 | .2 | .3 | .8 | 2.4 | 5.5 | 5.3 | 4.5 |
| Production per tenant family: | | | | | | | | | |
| Cotton lint ..... pounds | 3,012 | 4,058 | 3,256 | 4,373 | 5,049 | 5,064 | 4,433 | 5,028 | 6,208 |
| Cottonseed ..... do | 6,704 | 9,033 | 6,929 | 9,293 | 10,727 | 11,271 | 9,421 | 10,686 | 13,191 |
| Corn (share-rent land) ..... bushels | 40.6 | 18.6 | 51.0 | 41.7 | 22.1 | 19.5 | 19.1 | 23.3 | 30.9 |
| Corn (cash-rent land) ..... do | 10.1 | 9.7 | 2.9 | 3.2 | 16.8 | 37.0 | 79.6 | 70.8 | 63.8 |
| Production available for sale and farm use, per tenant family: | | | | | | | | | |
| Cotton lint ..... pounds | 1,506 | 2,029 | 1,628 | 2,187 | 2,525 | 3,798 | 3,325 | 3,771 | 4,656 |
| Cottonseed ..... do | 3,352 | 4,517 | 3,160 | 4,647 | 5,365 | 8,453 | 7,066 | 8,014 | 9,893 |
| Corn (share-rent land) ..... bushels | 20.3 | 9.3 | 25.5 | 20.8 | 11.0 | 14.6 | 14.3 | 17.5 | 23.2 |
| Corn (cash-rent land) ..... do | 10.1 | 9.7 | 2.9 | 3.2 | 16.8 | 37.0 | 79.6 | 70.8 | 63.8 |

[1] Data on share tenants not obtained in 1932.
[2] Data pertain to only 6 plantations in 1932, but to all plantations with croppers in later years.
[3] Persons between the ages of 10 and 70 years.
[4] An average of 3.4 acres per family plowed up in cooperation with A. A. A. program.
[5] An average of 4.9 acres per family plowed up in cooperation with A. A. A. program.

The larger average acreage in crops per share-tenant family than per sharecropper family is caused by several factors. The share-tenant families were larger, and a higher proportion of their cropland was planted to corn for work-stock feed than in the case of croppers (table 20). Share tenants also hired more outside labor to supplement their family labor during the cotton-picking season.

A considerable proportion of the corn used on plantations is produced on a share basis by croppers (table 9). On some plantations, however, feed crops are produced principally with wage labor. In such cases, land, work stock, and equipment are rented for cash to croppers who want to grow corn. A larger proportion of the share-tenant corn also is produced on cash-rented land. The cash renting of cornland to tenants is due primarily to the difficulty of dividing a production that ordinarily is used currently from the field by tenants for home consumption and to feed livestock.

The small average acreage operated per tenant family, associated with the yields usually obtained, result in a small volume of production per tenant family. The production of lint cotton per sharecropper family ranged from approximately 6 bales in 1932 to 10 in 1936, when exceptionally high yields prevailed.[15] The production per share-tenant family ranged from approximately 9 bales in 1934 to 12 bales in 1936. The quantities of cotton and corn per tenant family available for sale or home use after deducting the landlord's share are shown in the last section of the table.

[15] Bales of 500 pounds, gross weight.

### CROP INCOME, EXPENSES, AND NET RETURNS PER TENANT FAMILY

Data on the gross income, gross expenses, and net returns per tenant family for operations on their own crops are shown in table 21.

Information is not available on the additional earnings of tenants who worked in their spare time on the plantation-operator's wage crops or at other tasks, but it is known that these amounts were considerable in many cases. Furthermore, in addition to the incomes shown, the tenant family was provided with living quarters, space for a garden and some livestock, water, and wood for fuel.

Gross income (table 21) includes the value of the tenant's share of the crops produced and of payments received from the Agricultural Adjustment Administration. Gross expenses include the tenant's share of the production expenses on his crops, the amounts paid for cash-rented cornland, and charges for supervision, commissions, and interest.

TABLE 21.—*Gross income and expenses, and net returns per tenant family for operations on sharecrops, 1932–36*

| Item | Sharecroppers | | | | | Share tenants [1] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1932 [2] | 1933 | 1934 | 1935 | 1936 | 1933 | 1934 | 1935 | 1936 |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Plantations studied | 24 | 20 | 26 | 20 | 22 | 20 | 20 | 20 | 22 |
| Plantations with tenants | 20 | 23 | 23 | 17 | 19 | 16 | 13 | 10 | 9 |
| Tenant families on plantations | [3] 147 | 625 | 651 | 456 | 525 | 93 | 72 | 43 | 42 |
| Persons per tenant family | 3.8 | 3.5 | 3.5 | 3.6 | 3.4 | 4.4 | 4.2 | 3.8 | 3.8 |
| Workers per tenant family [3] | 2.9 | 2.8 | 2.8 | 2.9 | 2.7 | 3.4 | 3.3 | 3.0 | 3.0 |
| | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Gross income or value per family: | | | | | | | | | |
| Cotton lint | 94.11 | 187.37 | 201.93 | 233.17 | 312.56 | 353.50 | 417.38 | 411.97 | 594.55 |
| Cottonseed | 21.46 | 37.89 | 67.21 | 84.26 | 105.02 | 72.67 | 135.30 | 139.69 | 195.83 |
| A. A. A. payments | | 23.92 | 8.02 | 11.47 | 13.52 | 56.34 | 20.82 | 24.54 | 36.19 |
| Bankhead certificates | | | .42 | .05 | | | .42 | | |
| Corn | 13.68 | 11.40 | 20.16 | 24.00 | 25.02 | 30.96 | 65.73 | 88.30 | 78.30 |
| Total | 129.25 | 260.58 | 298.64 | 352.95 | 456.12 | 513.47 | 639.65 | 664.50 | 804.87 |
| Gross expenses per family: | | | | | | | | | |
| Cotton picking hired | 10.38 | 31.03 | 18.22 | 25.29 | 40.42 | 27.75 | 30.13 | 41.12 | 56.72 |
| Ginning | 10.06 | 24.71 | 20.64 | 27.06 | 31.24 | 46.25 | 42.31 | 46.67 | 57.62 |
| Bankhead certificates | | | 4.47 | 21.66 | | | 6.92 | 18.67 | |
| Other crop expenses [4] | 6.75 | 12.00 | 21.17 | 27.27 | 27.34 | 24.12 | 44.39 | 48.63 | 40.35 |
| Land rent (cash) | 4.88 | 5.86 | .08 | .41 | 6.62 | 21.04 | 19.50 | 25.55 | 41.05 |
| Supervision, commissions, and interest | 17.62 | 27.01 | 32.56 | 26.84 | 31.30 | 46.35 | 39.54 | 27.59 | 36.96 |
| Total | 55.69 | 100.61 | 97.74 | 128.53 | 136.92 | 165.51 | 182.79 | 208.23 | 232.70 |
| Net return per cropper family for labor [5] | 73.56 | 159.97 | 200.90 | 224.42 | 319.20 | | | | |
| Net return per share-tenant family for labor, work stock, and equipment [5] | | | | | | 347.90 | 456.86 | 456.27 | 572.17 |

[1] Data on share tenants not obtained in 1932.
[2] Detailed information on sharecropper incomes and expenses was obtained on only 6 plantations in 1932, but on all plantations with croppers in later years.
[3] Persons between the ages of 10 and 70 years.
[4] Principally fertilizer, poison, hoes, sacks, and labor for hoeing. Share tenants also purchased seed.
[5] These net returns do not include the value of living quarters and other perquisites obtained by tenants, nor do they include the additional earnings of tenants who worked for cash wages in their spare time.

The small gross incomes per tenant family were caused by small volume of production together with the prices that prevailed during the period (tables 20 and 21). The average annual gross income per sharecropper family during the 5 years ranged from approximately $129 in 1932 to $456 in 1936. During the 4-year period for which

data are available, the average annual gross income per share-tenant family ranged from about $513 in 1933 to $905 in 1936. These variations in average gross earnings reflected principally changes in incomes from the cotton enterprise, for other sources of income were relatively very small. Variations in incomes from the cotton enterprise were caused by changes in the acreage and production of cotton (table 20); by changes in prices (table 16); and by changes in payments received for participating in the programs of the Agricultural Adjustment Administration.

The principal items of crop expense incurred by tenants were for ginning; hiring cotton-picking labor; fertilizer, poison, and other crop supplies; and supervision, commissions, and interest. As a result of increases in the volume of production and in prices of cost items, the average gross crop expenses per tenant family increased from approximately $56 in 1932 to $137 in 1936 in the case of sharecroppers, and from $166 in 1933 to $233 in 1936 in the case of share tenants.

The average net return obtained per sharecropper family for its labor on share crops increased each year from a low point of about $74 in 1932 to about $319 in 1936. The net return obtained per share-tenant family for its labor, work stock, and equipment also increased each year from about $348 in 1933 to about $672 in 1936. These variations in returns per tenant family followed to some extent the variations in plantation net incomes (table 19), although the two sets of data are not directly comparable because of differences in methods of computation.

As data were not obtained on the power and equipment expenses incurred by share tenants, it is not possible directly to compare the net returns obtained by sharecroppers and share tenants for their labor.

### FACTORS AFFECTING RETURNS PER TENANT FAMILY

Variations in average tenant earnings from year to year reflected differences primarily in the acreage and yield of cotton and in prices obtained for cotton. Other items such as the value of the corn produced, benefit payments from the Agricultural Adjustment Administration, and the general level of cash expenses incurred also affected earnings, but were of relatively small significance as compared with the returns from the cotton enterprise.

The prevailing low general level of tenant earnings in the area is directly attributable to the small volume of production per family and per worker, and to the prices that have prevailed for the commodities grown. But even though cotton prices might be at substantially higher levels than during the last few years, the earnings per tenant family probably would remain at low levels unless it be found possible also to increase the volume of production per worker.

The small average acreage and volume of production per tenant worker is attributable to the system of farming followed and to the production methods used. As cotton is the most profitable crop grown in the area generally, a high proportion of the cropland is devoted to its production. With present prevailing production methods, large amounts of hand labor are required during the short seasonal period when cotton hoeing and picking are performed; hence, the acreage per tenant family usually is limited to the acreage that can be handled effectively when these two operations must be per-

formed. This system results in a poor distribution of labor in which rush seasons alternate with long periods of idleness, and in a limited number of work days per worker during the year.

These conditions are illustrated in table 22 and figure 8. The data pertain to sharecroppers only, but are well representative also of share-tenant or owner-operator family units with a similar-sized labor force and with comparable amounts of additional labor hired.

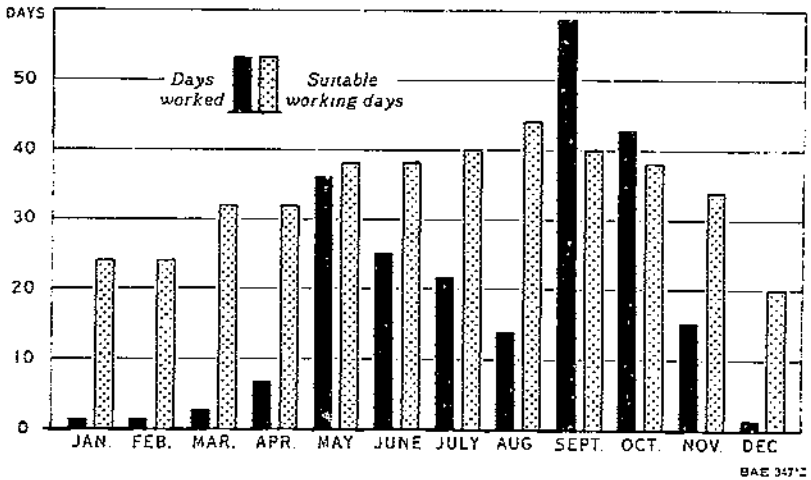


FIGURE 8.—Usual number and distribution by months of man workdays on 14 acres in cotton and 2 acres in corn, operated by a sharecropper family with a labor force equivalent to two men. The black bars indicate the number of man-equivalent days worked by the family; the dotted bars indicate the estimated number of man-equivalent days that the family could have worked in the field, excluding holidays and rainy days.

TABLE 22.—*Labor performed per sharecropper family on their crops, and net returns per cropper workday compared with prevailing wage rates, 1932–36*

| Item | 1932 | 1933 | 1934 | 1935 | 1936 | 5-year average 1932–36 |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Plantations studied | 25 | 26 | 26 | 26 | 22 | 24 |
| Plantations with croppers | 20 | 23 | 23 | 17 | 19 | 20 |
| Cropper families on plantations | 147 | 127 | 161 | 156 | 127 | 184 |
| Workers per cropper family [2] | 2.9 | 2.8 | 2.8 | 2.9 | 2.7 | 2.8 |
| M. w. d.[3] on cropper crops [4] | | | | | | |
| Cotton, excluding harvest | 85 | 90 | 67 | 72 | 74 | 77 |
| Cotton harvest | 85 | 100 | 84 | 113 | 141 | 104 |
| Corn, including cash-rent land | 7 | 8 | 16 | 16 | 11 | 12 |
| M. w. d.[3] hired on cropper crops | 27 | 31 | 14 | 27 | 32 | 27 |
| M. w. d.[3] worked per cropper family | 202 | 206 | 148 | 174 | 180 | 166 |
| M. w. d.[3] worked per cropper worker | 70 | 73 | 53 | 60 | 67 | 59 |
| | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Net returns per cropper family [5] | 75.76 | 170.07 | 200.76 | 224.42 | 319.29 | 195.61 |
| Net returns per cropper m. w. d. | .37 | .79 | 1.36 | 1.29 | 1.77 | 1.17 |
| Prevailing rate per day wage labor [6] | .90 | .90 | .75 | 1.00 | 1.00 | .79 |

[1] The data pertain to only 6 plantations in 1932, but 7 to 12 plantations with croppers in later years.
[2] Persons between the ages of 16 and 75 years.
[3] Man workdays, or equivalent.
[4] See table 20 for crop acreages and production per cropper family.
[5] From table 21. These net returns do not include the value of living quarters and other perquisites obtained by sharecroppers, nor do they include the additional earnings of sharecroppers who worked for cash wages in their spare time.
[6] Cash wage rates, excluding living quarters and other perquisites.

During the 5-year period 1932–36, the 2,404 cropper families for which data are available produced an average of 7.9 bales of cotton and about 43 bushels of corn per family per year (table 20). This average production required a total average input of 193 man-equivalent-days of labor per family (table 22). Of this labor, an average of 166 days were contributed by members of the sharecropper family. The average family comprised approximately three workers, including a man, his wife, and a child able to assist in field work. Of the average number of days worked per family, the man worked about 100 days and members of the family performed the equivalent of about 66 man-workdays. The remainder, or an average of 27 man-equivalent-days per year, were contributed by wage labor hired for cotton picking.

During the 5-year period, the number of man-equivalent-days worked per cropper family ranged from 148 in 1934, a year of relatively low production of cotton, to 180 in 1936, when cotton production was relatively high.

During the 5 years, an average of $1.17, excluding perquisites, was earned per day of man-equivalent labor performed by working members of sharecropper families on their own crops. This compares with an average of 79 cents per day received by an adult male wage laborer during the same period. In only 1 year out of 5, 1932, were the earnings per day of cropper work less than the rate paid per day of wage labor. Moreover, sharecroppers probably worked more days per year than did occasional wage laborers. Obviously, sharecroppers would not have fared so well, relatively, had they worked for wages instead of on a share basis during the last 4 years of the study.

The reason for the small acreage and volume of production per sharecropper family is brought out in figure 8. This chart shows the usual distribution by months of the man-equivalent-days of labor performed by a sharecropper family of three workers operating 14 acres in cotton and 2 in corn. The estimated number of man-equivalent-days that the labor force could have worked in the field, excluding holidays and rainy days, are also indicated in the chart. The three workers, considered equivalent to two men, consisted of a man, his wife, and a child who did field work. The operated acreage represents the approximate acreage normally worked by such a force. Yields per acre of 1,094 pounds of seed cotton and 20 bushels of corn were assumed. The amounts of labor used are based upon records obtained on the plantations studied.

Heavy demands for labor occur from May until approximately the middle of July, when cultivating and hoeing are in progress (fig. 9), and from late August until the latter part of November, the period during which cotton is usually harvested (fig. 10). Labor in addition to the family is often hired during the latter period, particularly if the weather interferes with the timeliness of the operation. The two critical periods of hoeing and harvesting, and particularly the latter, serve definitely to limit the acreage in cotton operated per family and per worker, and consequently the volume of production and the income obtained. During the remainder of the year, the family labor force is idle most of the time, unless employment be found elsewhere.

It is not presumed in this bulletin to present a solution to the problem of the prevailing low volume of production and of the resulting low cash earnings per tenant family in the area. It may be well, how-

ever, to discuss briefly some of the alternatives that are often suggested as possible remedies.

One alternative is to provide remunerative supplementary employment for the long periods when the labor generally is idle. During the period of rapid agricultural development in the Yazoo-Mississippi Delta area, the clearing and fitting of land for cultivation provided an outlet for labor during idle seasons on farms, but this source of employment is now increasingly limited. Employment on wage crops also furnishes some supplementary work at present, but enterprises other than cotton generally are few and relatively limited, and employment on wage cotton is possible only through a reduction in the cotton acreage worked on a share basis. A desirable outlet for seasonal

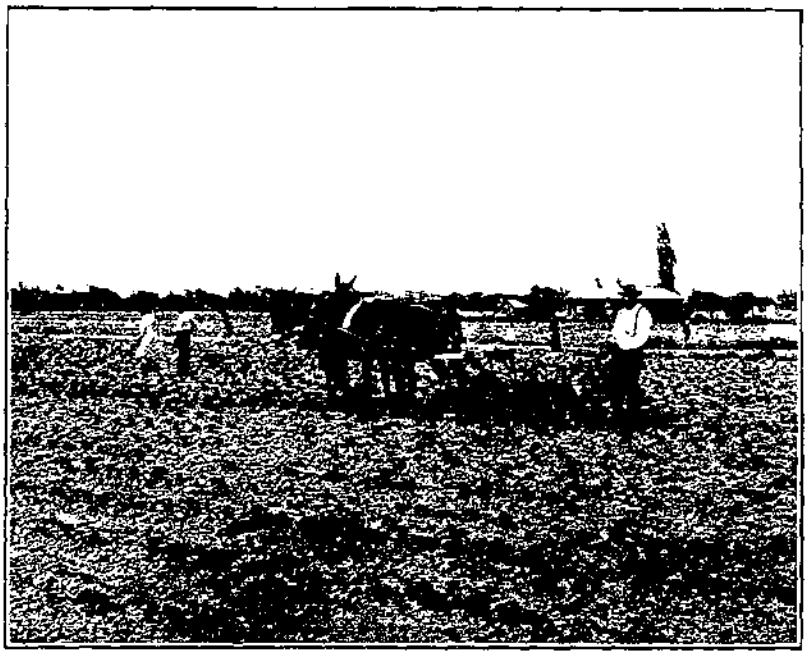

FIGURE 9.—A tenant family hoeing and cultivating cotton in the area. Much of the hoeing is done by women and children while the men do the cultivating.

surplus labor would be provided if it were found feasible to develop part-time industrial enterprises to utilize labor otherwise idle. The construction of needed roads and other public works in the area during slack labor seasons would be helpful.

Another alternative, but one not likely to prevail on the basis of present or prospective conditions, is the adoption of a more diversified or extensive system of farming that would increase the volume of production and the financial returns per worker, although probably at a lower return per acre of land. It is not probable that such a change will occur so long as cotton possesses a greater advantage, in terms of net returns per acre of land, relative to other adapted enterprises or to more extensive methods of cotton production. Furthermore, so long as cotton possesses this comparative advantage, any

material diversification or extensification of cropping systems would mean a lower average net return per crop acre. This in turn would result in lower incomes per farm family unless offset by materially increased prices of the commodities produced or associated with a removal of surplus labor to provide a larger acreage and volume of production per family remaining on the land.

A more probable development in the area will be the adoption of large-scale labor-saving machinery in cotton production when mechanical cotton harvesters are perfected and are proved to be economical. This development, if widespread and rapid, undoubtedly will be asso-

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FIGURE 10. A tenant family picking cotton. During the rush season of cotton picking the entire family usually is in the field. (Courtesy Farm Security Administration.)

ciated with a tremendous displacement of labor on the plantations, and a serious situation of human adjustments probably will prevail such as ordinarily follows the widespread adoption of any important labor-saving device. If such an adjustment can successfully be made, the adoption of labor-saving production practices should be of permanent benefit to those who remain on the land if the resulting larger volume of production per worker be reflected also in increased earnings.

### CREDIT ADVANCES TO TENANTS

Tenants on plantations usually are advanced, on credit, practically all of their living expenses during the crop-cultivating season, extending ordinarily from the beginning of March to the latter part of August. In years following disastrously low incomes, credit advances for tenant living expenses may begin in January. In addition, tenants usually

are advanced on credit all of their share of the production expenses incurred prior to cotton harvesting. During cotton harvesting, the tenant's share of the value of cottonseed above ginning charges usually is sufficient to provide for his current living expenses.

The kinds and amounts of credit advanced per sharecropper and share-tenant family and per acre of share cotton are shown for individual years in table 23. The largest item of credit advanced to tenant families was for food, clothing, and cash. Other credit advances were principally for the tenants' shares of crop-production expenses and, in the case of share tenants, for work-stock feed and machinery repairs. A large item in the crop-expense loans both to croppers and share tenants was for hired labor to supplement the family labor in picking cotton. The average amount of credit advanced per acre of tenant cotton increased from $5.62 in 1932 to $14.96 in 1936 in the case of sharecroppers, and from $11.29 in 1933 to $19.51 in 1936 in the case of share tenants.

TABLE 23.—*Plantation operator's credit advances to tenants for various purposes, per tenant family, 1932–36*

| Item | Sharecroppers | | | | | Share tenants [1] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1932 [2] | 1933 | 1934 | 1935 | 1936 | 1933 | 1934 | 1935 | 1936 |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Plantations studied | 24 | 26 | 26 | 26 | 22 | 26 | 26 | 20 | 22 |
| Plantations with tenants | 20 | 23 | 23 | 17 | 19 | 16 | 13 | 10 | 9 |
| Tenant families on plantations | 147 | 625 | 651 | 456 | 525 | 93 | 72 | 43 | 42 |
| Persons per tenant family | 3.8 | 3.5 | 3.5 | 3.6 | 3.4 | 4.4 | 4.2 | 3.8 | 3.8 |
| Workers per tenant family [3] | 2.9 | 2.8 | 2.8 | 2.9 | 2.7 | 3.1 | 3.3 | 3.0 | 3.0 |
| Credit advances per tenant family: | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Prior to harvest: | | | | | | | | | |
| Food, clothing, and cash | 52.60 | 63.03 | 74.17 | 83.66 | 81.11 | 70.65 | 87.12 | 90.13 | 88.81 |
| Doctor and medicine | 4.11 | 6.28 | 6.81 | 8.17 | 8.67 | 5.99 | 10.79 | 11.82 | 19.64 |
| Crop expenses [4] | 6.75 | 12.00 | 21.17 | 27.27 | 27.34 | 24.12 | 44.39 | 48.63 | 40.35 |
| Miscellaneous | 1.38 | 4.07 | 4.55 | 6.08 | 8.39 | 27.03 | 12.94 | 13.25 | 29.43 |
| Work-stock feed and machinery repairs | | | | | | 48.58 | 56.34 | 46.52 | 47.97 |
| Cotton picking hired | 10.39 | 31.03 | 18.22 | 25.20 | 40.42 | 27.75 | 30.13 | 41.12 | 56.72 |
| Total | 75.26 | 116.41 | 124.92 | 150.47 | 161.56 | 204.42 | 241.71 | 254.47 | 282.92 |
| Credit advances per acre in tenant cotton | 5.62 | 8.32 | 12.01 | 13.44 | 14.96 | 11.29 | 16.90 | 18.71 | 19.51 |

[1] Data on share tenants not obtained in 1932.
[2] Data on credit advances to croppers pertain to only 6 plantations in 1932, but to all plantations with croppers in later years.
[3] Persons between the ages of 10 and 70 years.
[4] Principally fertilizer, poison, hoes, sacks, and labor for hoeing. Share tenants also purchased seed.

The total amount of credit advanced per family per year is conditioned by the prospective value of the tenant's share of the current cotton crop, although the outcome of the preceding year's operations also influences the plantation operator's opinion, at least in the early part of the season, as to the amount of credit that he may advance with safety. The plantation operator tries to regulate his credit advances so as not to exceed the probable value of the tenant's crop share.

Sharecroppers often have no credit security other than their share of the crop produced, consequently credit indebtedness in excess of the value of the crop may be liquidated, insofar as the sharecropper is

concerned, by his moving off the plantation. When is it realized that the crop proceeds may not exceed the amount of their indebtedness, sharecroppers sometimes abandon their crop to work elsewhere on a wage basis. Particularly when labor is scarce, the plantation operator often meets this problem by canceling unpaid cropper accounts at the end of the crop season. The overadvance problem is not so acute in the case of share tenants who own work stock and equipment as additional loan collateral, but even here the work stock and equipment may have been sold on credit by the plantation operator. In general, however, unpaid accounts are more likely to be collected in subsequent years from share tenants than from sharecroppers. It is evident from this that the problem of tenant advances is a major consideration in successful plantation management.

A plantation operator furnishes supplies to tenants from his own commissary or store, or advances cash, or assumes responsibility with a merchant for his tenants' debts up to a specified amount per family. There is an increasing practice on plantations in this area of advancing cash to tenants, regardless of whether there is a store or commissary on the plantation. At the end of the crop season, the plantation operator deducts from the value of each tenant's share of the cotton crop the amount of the advances made to the tenant during the year, plus any service or interest charges. The balance is paid to the tenant in cash.

As practiced on the plantations studied, interest and commissions on credit advances to tenants are joint with charges for management and supervision. On some plantations, a supervision charge per acre of cropland is assessed against tenants, and little or no interest is charged for credit advances. On other plantations, supervision and interest charges are reflected only in profits on merchandise sold. The average joint charges for supervision, commissions, and interest per tenant family are shown in table 21.

### TENANT LIVESTOCK AND GARDENS

Tenants on plantations produce relatively little of the food they consume. This is one of the principal reasons for the large dependence upon credit for living expenses, already discussed.

The proportions of the number of sharecroppers and share tenants owning different classes of livestock in 1933, and the average number of livestock owned per family, are shown in table 24. Relatively more share tenants than sharecroppers maintained food livestock for home use, but in both cases the livestock kept per family usually were limited in number, of inferior quality, and too few to provide for any significant part of the family food needs.

Hogs and chickens were the principal classes of food livestock maintained by tenants. Each tenant house usually is located on the tract of cropland operated by the family, and, particularly in the case of sharecroppers, pasture and feed-storage facilities for cattle may be unavailable or not easily accessible. Share tenants, on the other hand, are provided with a lot and feed-storage facilities for work stock, and find it more convenient to maintain one or two cows. Consequently, only about 28 percent of the sharecropper families maintained cows, as compared with 65 percent of the share-tenant families. Usually,

only one cow was kept per tenant family owning cows. Hogs and chickens are more commonly kept, in that they are acquired with less cash outlay and are more easily maintained on the tenant home site.

TABLE 24.—*Proportion of tenant families owning specified classes of livestock, and average number of head owned per family, 1933*

| Item | Share-croppers | Share tenants |
|---|---|---|
| | *Number* | *Number* |
| Plantations reporting | 21 | 21 |
| Tenant families on plantations reporting | 342 | 83 |
| Persons per tenant family | 4.7 | 4.4 |
| | *Percent* | *Percent* |
| Proportion of tenant families owning— | | |
| Horses and mules | 41 | 100.0 |
| Cows | 28.3 | 65.1 |
| Hogs | 77.8 | 89.2 |
| Chickens | 87.4 | 92.7 |
| | *Number* | *Number* |
| Average per tenant family owning— | | |
| Horses and mules | 1.0 | 1.2 |
| Cows | 1.1 | 1.2 |
| Hogs | 3.3 | 3.1 |
| Chickens | 19.2 | 16.7 |

Most of the tenants on the plantations studied produced vegetables or truck crops in the field or in enclosed spaces near the houses. These gardens or truck patches usually were from one-eighth to one-fourth of an acre in size. The production varied from practically nothing to significant quantities, reflecting differences in the ability or willingness of tenants to produce such commodities for home use.

Failure of tenants to grow more of their food needs may be attributed to several factors. Pasturage often is unavailable, or the tenant may not have funds to buy cows. Then, too, the tenant often is not aware of the importance of such items as milk and vegetables in the family diet, or may be unwilling to do the additional work required to keep livestock and to grow food crops.

Dependence upon cotton as a basis for credit advances for practically all living expenses is deeply ingrained in the typical plantation tenant, and intensive teaching is needed to stress the importance of adequate diets and of food production. An effective supplement to this teaching would be the persistent encouragement by the plantation operator of those tenants who are interested in growing home-use food. This encouragement should take the form not only of providing the necessary land, but also supervision in this growing and in providing adequate storage facilities for food staples.

### RELATIVE COSTS TO PLANTATION OPERATOR OF USING SHARECROPPERS, SHARE TENANTS, AND WAGE LABORERS

The relative economic advantages to the plantation operator of using different types of labor on the plantations studied were reversed as between 1932 and the last 4 years of the study. In 1932, cotton prices and incomes were low in relation to wage-labor rates, and, on the basis of the usual rental agreements, it was less expensive for the plantation operator to use share labor than wage labor. During the last 4 years of the study, on the other hand, cotton prices and incomes were relatively much higher than wage-labor rates, and the plantation oper-

ator would have benefited more by using wage labor than share labor. Data on share-tenant earnings are not available for 1932, but during the last 4 years of the study, plantation operators were advantaged more by using sharecroppers than share tenants. These relationships may be indicated by data already presented.

Although data are not available directly on this point, the relative economic advantages to the plantation operator of using sharecroppers or share tenants from 1933 to 1936 may be approximated rather closely. This may be done by assuming that one-half of the share-tenant crop is payment for the use of tenant labor and that one-fourth of the crop is payment for the use of the tenant's work stock and equipment, after deducting other cash operating expenses. On that basis, the costs to the plantation operator of using the tenant's equipment and work stock from 1933 to 1936 were $7.31, $10.36, $10.72, and $14.70, respectively, per acre of cropland operated by share-tenant families on a share basis (tables 20 and 21). On the basis of the average power and equipment costs per crop acre on the plantations studied, the plantation operator could have supplied the necessary power and equipment during these 4 years at costs of $6.16, $7.96, $7.80, and $8.56 per year, respectively, per crop acre.

In other words, the plantation operator would have benefited from using sharecroppers instead of share tenants during all 4 years from 1933 to 1936. The margin of advantage in using sharecroppers instead of share tenants is least, of course, when crop incomes are low in relation to work stock and equipment costs, and is highest when crop incomes are relatively favorable. The period of the study is too limited for extensive generalization, but the relatively larger net plantation returns from the use of sharecroppers as compared with share tenants during years of favorable yields and incomes is undoubtedly a major factor accounting for the predominance of sharecroppers in this area.

The relative costs to the plantation operator of using sharecroppers and wage laborers during the period of the study may be noted in the last section of table 22. In 1932, sharecroppers earned an average net return of 45 cents per work day. In effect, this was the average rate, excluding perquisites furnished sharecroppers, that the plantation operator paid for a day of sharecropper labor. If wage labor had been used, the labor cost to the operator would have amounted to 60 cents per day. Thus wage-labor rates were relatively high as compared with crop incomes in 1932, and the plantation operator benefited more that year from using sharecroppers than wage laborers. This income-wage relationship was reversed, however, during the next 4 years. In each of these years, the average net earnings per day of sharecropper labor were substantially above the average rate per day for wage labor; hence, on the average, the plantation operator benefited more from using wage labor than sharecropper labor during these 4 years.

These relationships during the period of the study were attributable primarily to the relative prices of commodities produced and to prevailing wage rates. Yields generally were favorable and did not vary materially as between crops produced with sharecroppers, share tenants, or wage laborers.

A continuation of the income advantage of using wage labor probably will result in an increase in wage operations on plantations in the

area, particularly if additional economies can be achieved through the use of wage labor in conjunction with large-scale machinery. That such a change is taking place is indicated later. The extent to which such a movement may proceed is conditioned not only upon the relative levels of crop incomes, wage rates, and power costs, but also upon a solution of the cotton-hoeing and -picking problems, and upon the bargaining ability of labor itself as to the tenure status that it prefers.

### RECENT CHANGES IN TENANCY AND LABOR

Year-to-year changes in the proportions of different types of labor used reflect changes in attitudes on the parts both of plantation operators and of labor as to the status of employment that gives promise of being most remunerative, and in the relative bargaining ability of employer and employee. Following years of low share-labor earnings as compared with earnings of wage labor, plantation workers often prefer to obtain employment as wage laborers rather than as sharecroppers. The reverse holds true following years of high sharecropper earnings as compared with wage-labor earnings.

Somewhat similar considerations apply as between obtaining employment as sharecroppers or share tenants, particularly if the share tenant owns only a small equity in encumbered work stock and equipment.

The plantation operator's wishes as to the status of the labor he employs may be the opposite of the employees', hence the question is settled on a bargaining basis that is dependent primarily upon the supply of labor in relation to demand, and on the desire of labor for employment. The bargaining advantage is with labor in those years in which the supply of labor is low in relation to the need, whereas it is with the employer in other years. Shifts from one employment status to another are easily made. Practically all share-rental leases on plantations are verbal agreements that may be terminated at the end of the year either by the plantation operator or by the tenant.

During recent years, there has been indication that a plentiful supply of labor and the increased use of large-scale equipment in production have been associated with a rapid increase in the use of wage labor as compared with share labor. The use of large-scale machinery in cotton production, associated with the availability of a plentiful and relatively low-priced labor supply for hand operations like hoeing and picking, has proved much more remunerative to plantation operators than production on a share basis. Together with this advantage in large-scale production methods are the attendant reduction in the number of laborers used and hence the decreased risks in furnishing credit advances to tenants.

Changes that have been occurring in the types of labor used on plantations in this area are indicated by data relating to 12 plantations on which detailed records were kept during all 5 years of the study. During the 4-year period, 1933–36, there was a pronounced increase on these plantations in the proportion of cropland operated with wage labor, a decrease in the proportion operated with sharecroppers, and a marked reduction in the proportion operated with share tenants. The proportions of the cropland operated with wage labor during these 4 years were 30, 40, 43, and 47 percent, respectively. The proportions operated with sharecroppers during these years were

52, 46, 46, and 43 percent, respectively, and the proportions operated with share tenants were 18, 14, 11, and 10 percent, respectively.

That the situation on these plantations is representative, at least in part, of trends on other plantations in the area is indicated by data obtained from records of the Agricultural Adjustment Administration in a representative county in the Yazoo-Mississippi Delta area. Records were obtained in the county for all plantations entered in the 1936 conservation program, provided their average acreage in cotton during the 1928–32 base period was in excess of 200 acres and that no significant changes had occurred in their sizes from 1934 through 1936. Records were available for 75 such plantations.

A summary of these records shows that the proportions of the total cotton acreage operated with wage labor each year from 1934 through 1936 were 27, 29, and 42 percent, respectively. The proportions operated with sharecroppers during these years were 58, 56, and 48 percent, respectively, and those operated with share tenants were 12, 13, and 9 percent, respectively.

The increasing use of labor other than on a share basis from 1930 to 1935 is also indicated by census data for the 10 counties wholly within the area (table 25). An increase in the number of farms operated by full owners, part owners, and managers was more than offset by a decrease in the number of farms operated by croppers and other tenants, resulting in a net decrease in the total number of farms in the 10 counties. It is probable that a large proportion of these tenants moved off farms in the area, for a net decrease occurred in the rural farm population. The decreases in number of tenant farms and in rural farm population were associated with an increase in total farm land and a slight decrease in cropland. These changes resulted in an increase in the average size of farms operated by each tenure, and particularly of farms operated by full owners, part owners, and managers.

TABLE 25. *Changes in the number of farm operators, in various tenure groups and in the acreage of land operated, by counties, Yazoo-Mississippi Delta area, 1930 to 1935*[1]

| Item | Farm operators[2] | Farm land | | Cropland harvested | |
|---|---|---|---|---|---|
| | | Total | Per operator | Total | Per operator |
| | Number | Acres | Acres | Acres | Acres |
| Full owners, part owners, and managers | | | | | |
| 1930 | 4,084 | 685,705 | 154.7 | 224,163 | 50.9 |
| 1935 | 5,170 | 928,774 | 179.4 | 170,137 | 85.1 |
| Sharecroppers | | | | | |
| 1930 | 26,705 | 1,048,863 | 18.5 | 980,723 | 17.3 |
| 1935 | 5,243 | 958,079 | 18.7 | 884,030 | 17.3 |
| Other tenants | | | | | |
| 1930 | 10,287 | 603,771 | 31.3 | 179,052 | 24.8 |
| 1935 | 11,870 | 777,193 | 18.7 | 354,955 | 29.8 |
| Total operators | | | | | |
| 1930 | 80,072 | 2,288,579 | 28.7 | 1,683,938 | 21.0 |
| 1935 | 68,203 | 2,459,511 | 36.0 | 1,627,782 | 24.3 |

[1] The area pertains to the 10 counties wholly within the area: Bolivar, Coahoma, Humphreys, Issaquena, Leflore, Quitman, Sharkey, Sunflower, Tunica, and Washington.

[2] In census reports, farm operators include owners, managers, and tenants.

[3] The decrease in number of farm operators was associated with a decrease in total farm population from 291,057 persons in 1930 to 252,482 persons in 1935.

Bureau of the Census.

The evidence, although incomplete, does indicate rather definitely the changes in the labor situation that have been occurring in the area. Some of the decrease in number of tenants may have been caused by an increase in farm ownership by tenants. But a substantial part of the change resulted from the increased use of wage or family labor with improved machinery. This is indicated not only by data from the plantations studied, but also by the large increase in tractor sales in the area and by the fact that the acreage in harvested cropland per farm operated by full owners, part owners, and managers increased from about 55 acres in 1930 to approximately 81 in 1935.[16]

## CONSIDERATIONS IN PLANNING THE ORGANIZATION AND OPERATION OF PLANTATIONS

The discussion to this point has furnished a general description of the agriculture of the area, of the factors that have contributed to its development, and of the situation in respect to production and earnings on plantations during the period of the study. Attention also has been directed to the production problems both physical and economic in the area, and to the kind and direction of changes that are being made in plantation organization and operation.

Although invaluable in providing an understanding of the local agriculture, this background material furnishes only a partial basis for the evaluation of alternative production programs adapted to the area. Financial returns during a specified period in the past may not provide a criterion for successful plantation management in the future. This is evident because of the frequent changes in relative prices and in other conditions that influence plantation returns. Thus further information is needed upon which to base an evaluation of adapted production programs in terms of prospective price conditions likely to prevail in the future.

The plantation operator's primary economic objective is to obtain from his plantation business the maximum net returns consistent with the upkeep of his land and other production resources. The extent to which this objective is achieved depends upon the selection, combination, and operation of the enterprises that constitute the plantation organization, and upon the operator's ability to make timely modifications in his business to take advantage of changing price relationships and production conditions. Thus successful plantation management involves a forward-looking approach based upon an intimate familiarity with production and production practices, and upon well-considered estimates of prices and price relationships that are likely to prevail for a period of time in the future.

Information is now presented that may serve as a guide in evaluating various sytems of plantation organization and operation adapted to the area. Basic data are presented on crop yields, on the total amounts and seasonal distribution of labor and power used in production, and on direct costs involved in the production of individual enterprises. Consideration is given to the costs of using animal and mechanical power and equipment, and to the prevailing overhead or fixed charges incident to various plantation systems. Attention is given to the relative prices of items and services bought and sold in the area. Finally, in the last part of the bulletin, a planning procedure is illus-

[16] Increases in tractor sales in the area are discussed on p. 26.

trated whereby the basic data presented may be used in budgeting the relative returns that may be expected from various plantation systems on the basis of specified assumptions regarding prices and production.

The basic data presented on yields and production, and on the labor, power, and other items used in production are based on usual accomplishments in the area as determined from records covering a period of 5 years on the plantations studied. Experimental data at the Delta Branch Experiment Station [17] at Stoneville, Miss., also were used. In general, data on yields and on production practices represent the modal or most common situation on the plantations studied. Conditions on individual plantations may differ considerably from the usual accomplishments described, and the individual operator in all cases should base his planning procedure, insofar as possible, upon conditions and accomplishments on his own plantation by making the necessary modifications in these data here presented.

### NORMAL YIELDS, MATERIALS, AND CONTRACT SERVICES PER ACRE FOR CROPS

Yields vary widely as between plantations and as between different years on the same plantation because of differences in soils, climate, production practices, and other conditions. Data on the normal yields and on the usual amounts of seed, materials, and miscellaneous cash expenses associated with specified yields per acre for the principal crops in the area are shown in table 26. The normal yields shown represent the production that reasonably may be expected over a period of years on fairly productive soils and under conditions of average production efficiency in this area.

TABLE 26.—*Normal yields and usual amounts of seed, materials used, and miscellaneous cash expenses per acre for various crops*

| Crop | Yield | Planting seed | Materials used | Miscellaneous cash costs | |
|---|---|---|---|---|---|
| | | *Pounds* | | | *Dollars* |
| Cotton | {350 pounds lint, 744 pounds seed | 1 60 | Fertilizer, 150–200 pounds,[1] Poison, 6 pounds.[2] | Ginning, bagging, and ties | 4.33 |
| Corn | 20 bushels | 10 | | | |
| Oats | 35 bushels | 80 | | | |
| Alfalfa hay | 2 tons[3] | [4] 25 | | Baling wire | .80 |
| Soybeans: | | | | | |
| For seed | 15 bushels[5] | [5] 30 | | Inoculation | .10 |
| For hay | 1 ton | [6] 60 | | do | .20 |
| | | | | Baling wire | .60 |
| Soybeans interplanted in corn and turned under. | ¾ ton dry-matter equivalent.[7] | 10 | | Inoculation | .03 |
| Winter legume turned under. | ——do.[3] | 20–30 | | do | .20 |
| Sagrain-soybean pasture | Grazed [7] | 10 (each) | | do | .03 |

[1] Nitrogenous fertilizers containing approximately 30 pounds of available nitrogen. Commercial fertilize is not commonly used on cotton preceded by leguminous crops turned under.
[2] Calcium arsenate. Applications irregular, depending on extent of boll weevil infestation.
[3] Approximately 30 pounds of nitrogen made available for crop production each of 2 succeeding years. (Based on observations made at the Delta Experiment Station.)
[4] 1 seeding usually suffices for 3 years of production.
[5] Large-seed varieties. Small-seed varieties, 15 pounds per acre.
[6] Small-seed varieties. Large-seed varieties, 150 pounds per acre.
[7] Approximately 65 days of grazing for 1 head of work stock, without supplemental feed.

[17] A substation of the Mississippi Agricultural Experiment Station, State College, Miss.

Data pertaining to crops other than legumes turned under are based upon long-time average yields on the plantations studied, and represent the usual or most common yields and associated amounts of seed and other items used in their production. The tonnage of legumes turned under likewise was determined from plantation records. Estimates on the fertility equivalents of legumes were based upon observations conducted at the Delta Branch Experiment Station.

### LABOR AND POWER USED FOR CROP PRODUCTION

Data were obtained during each year on the field operations in producing crops, on the period when various operations were performed, and on the acreage covered per 10-hour day with different types of power and equipment. Considerable variation existed in respect to these things because of variations in weather conditions as between different years, and because of differences in soils and in production

BAE 36150

FIGURE 11.— Land-breaking units in common use on plantations in the Yazoo-Mississippi Delta area. These are a two-mule single-moldboard turn plow, a four-mule middlebuster, and a tractor operating two middlebusters.

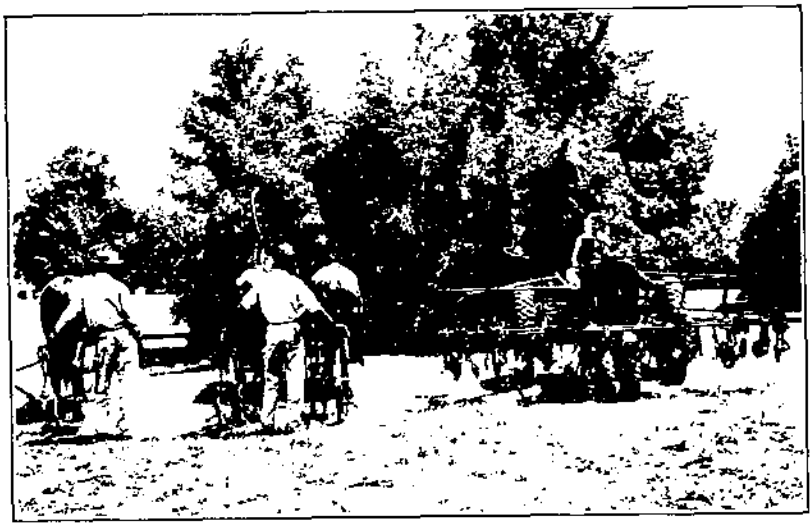
practices on individual plantations. Moreover, some individuals are particularly adept in handling work stock or tractors and can cover ground more effectively and in less time than can others. By qualifying the data obtained in terms of average or most usual conditions, however, it was found possible to determine rather well-defined patterns of practices generally followed in the production of various crops.

In the following subsections, a table and a chart are shown for each of the principal crops for which yield information is presented in table 26. There are shown in each table the operations usually performed in producing the crop, the number of times each operation is performed, and the total number of hours of labor and power used per acre for each operation. Each chart shows the periods during which the various operations are usually performed, the variations noted from the usual periods, and the monthly distribution of the

hours of labor and power used per acre. The types of power and equipment in common use on plantations in the area are illustrated in figures 11, 12, and 13.

BAE 36148

FIGURE 12.—Equipment commonly used for planting row crops in this area. These are a one-mule one-row planter, a two-mule two-row planter, and a tractor-operated four-row planter.



BAE 36149

FIGURE 13.—Cultivating units in common use on the Delta plantations. These are a ½-row cultivator operated with one mule, a one-row two-mule cultivator, and a four-row tractor cultivator.

Tractors are becoming increasingly important here as sources of power for the production of crops, hence data are shown for both tractor operations and mule operations. The tractors commonly used

are 10-20 horsepower units that ordinarily pull two-bottom plows for breaking, and four-row equipment for rebreaking, planting, and cultivating row crops.

When mules are used, land breaking ordinarily is done with two to four mules, depending on whether a single-moldboard plow or a middlebuster is used. Following land preparation and planting, row crops produced with mules usually are cultivated with one mule and ½-row equipment, or two mules and one-row equipment.

### COTTON

Information on the usual operations and on the amounts of labor and power used per acre in producing cotton with three common power and equipment units is shown in table 27. The periods when each operation, usually is performed, the variations from the usual periods, and the monthly distribution of labor and power used per acre are shown in figure 14.

TABLE 27. *Usual operations, and man labor and power used per acre in producing cotton with 3 common power and equipment units*

| Operation | ½-row mule-cultivation | | | 1-row mule-cultivation | | | 4-row tractor-cultivation | | |
|---|---|---|---|---|---|---|---|---|---|
| | Times over | Total time per acre | | Times over | Total time per acre | | Times over | Total time per acre | |
| | | Man | Mule | | Man | Mule | | Man | Tractor |
| | *Number* | *Hours* | *Hours* | *Number* | *Hours* | *Hours* | *Number* | *Hours* | *Hours* |
| Prepare and plant: | | | | | | | | | |
| Break | 1 | 2.0 | 8.0 | 1 | 2.0 | 8.0 | 1 | 1.0 | 1.0 |
| Disk | | | | | | | 1 | .7 | .7 |
| Rebreak [1] | 1 | 1.7 | [2] 6.8 | 1 | 1.7 | [2] 6.8 | 1 | .7 | .7 |
| Apply fertilizer | 1 | 1.1 | 1.1 | 1 | 1.1 | 1.1 | 1 | 1.2 | 1 |
| Drag or harrow | 2 | 2.8 | 2.8 | 2 | 2.8 | 2.8 | 1 | .5 | .5 |
| Plant | 1 | 1.4 | 1.4 | 1 | 1.4 | 1.4 | 1 | 1.2 | 1 |
| Total | | 9.0 | 20.4 | | 9.0 | 20.4 | | 4.9 | 4.9 |
| Cultivate, hoe, and poison: | | | | | | | | | |
| Cultivate | 8 | 24.0 | 25.6 | 8 | 13.2 | 26.4 | 8 | 3.2 | 3.2 |
| Chop and hoe | 3 | 22.0 | | 3 | 33.0 | | 3 | 33.0 | |
| Poison [3] | | .6 | .6 | | .3 | .6 | | .2 | .1 |
| Total | | 77.6 | 21.9 | | 46.5 | 27.0 | | 36.4 | 3.3 |
| Harvest [4]: | | | | | | | | | |
| Pick | | 87.5 | | | 87.5 | | | 87.5 | |
| Weigh | | 3.0 | | | 3.0 | | | 3.0 | |
| Load and haul to gin | | 4.0 | 4.0 | | 3.0 | 6.0 | | 4.0 | [5] |
| Total | | 94.5 | 6.0 | | 93.5 | 6.0 | | 94.5 | |
| Total, all operations | | 181.1 | 72.5 | | 150.1 | 74.1 | | 145.8 | 6.6 |

[1] If stalks are cut before breaking, rebreaking usually is dispensed with.
[2] Rebreaking sometimes is done with only 2 mules.
[3] Applications irregular, depending on extent of boll weevil infestation.
[4] Based on yield of 1,094 pounds of seed cotton, and an average picking rate of 125 pounds of seed cotton per man per 10-hour day.
[5] Cotton usually hauled to gin with 2-mule teams. Approximately 6 mule-hours per acre are used. If tractor were used, approximately 1 tractor-hour per acre would be required.

The large amount of hand labor used in hoeing and harvesting cotton is significant. In the case of the half-row mule system, 49 percent of the man labor used before harvesting was for chopping and hoeing, and 54 percent of the total amount of labor used for all oper-

ations was for picking. These proportions are increased in the systems in which larger power and equipment units are used.

The hand-labor operations on cotton are rendered particularly significant because of the limited period during which they usually need to be performed. The three hoeings usually done follow each other closely during May, June, and the first half of July (fig. 14). Cotton usually is harvested from the latter part of August through November.

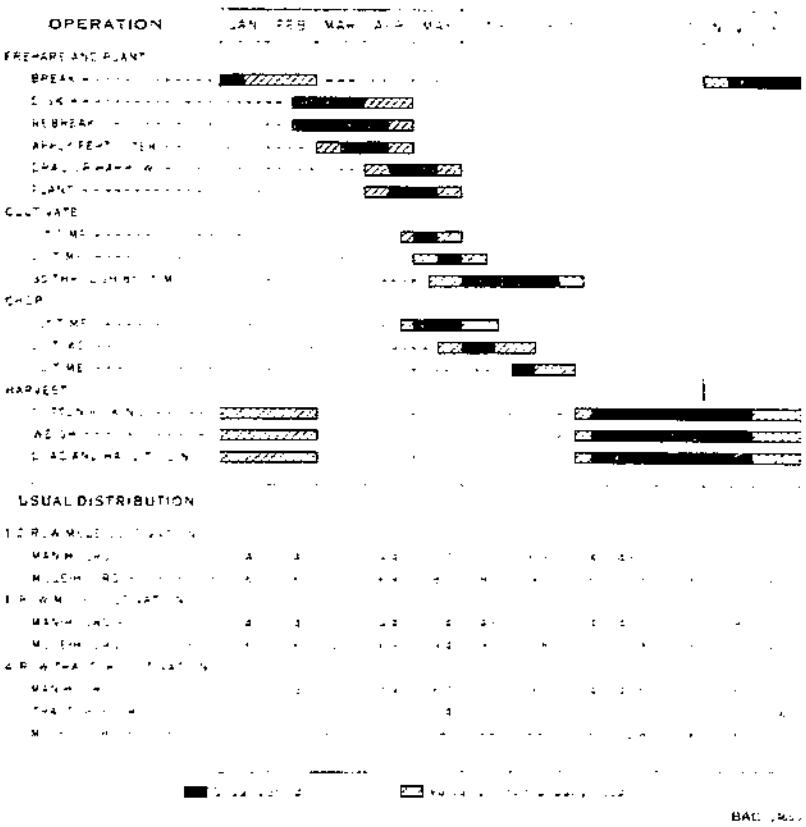



FIGURE 14.—Periods during which operations are performed on cotton, and usual distribution by months of man labor, mule work, and tractor work per acre.

As shown in the lowest section of figure 14, the labor demands of the cotton enterprise are relatively light during the remainder of the year.

Physical conditions in the area are well adapted to the use of large-scale production equipment, but the large amounts and uneven distribution of hand labor on cotton have retarded the fuller use of such equipment. The maintenance of a labor force to meet these peak needs has not provided inducement for the widespread adoption of labor-saving machinery when the labor is employed on a share basis. The use of wage labor and large-scale equipment is increasing, but the extent to which this development can proceed is conditioned by the amount of transient or other labor available for hoeing and picking, and particularly the latter. The development of economical me-

chanical cotton harvesters undoubtedly would result in a widespread adoption of large-scale cotton-production equipment on plantations in the area.

### CORN

Practically the same operations are performed in preparing land for corn as for cotton, and decision to plant one crop or the other on the land prepared sometimes is postponed until spring. After planting, however, much less labor is used on corn than on cotton. The usual operations and the normal amounts of labor and power used for producing an acre of corn with three common power and equipment units are shown in table 28.

TABLE 28.—*Usual operations, and man labor and power used per acre in producing corn and interplanted soybeans with 3 common power and equipment units*

| Operation | [illegible]-row tractor-cultivator unit | | | 2-row tractor-cultivator unit | | | 4-row tractor-cultivator unit | | |
|---|---|---|---|---|---|---|---|---|---|
| | Times over | Total time per acre | | Times over | Total time per acre | | Times over | Total time per acre | |
| | | Man | Man | | Man | Man | | Man | Tractor |
| | Number | Hours | Hours | Number | Hours | Hours | Number | Hours | Hours |
| Prepare and plant | | | | | | | | | |
| Break | 1 | 2.0 | 3.0 | 1 | 2.0 | 3.0 | 1 | 1.0 | 1.0 |
| Disk | | | | | | | 2 | .7 | .7 |
| Rebreak | 1 | .7 | 1.0 | | .7 | 1.0 | | | |
| Drag or harrow | 2 | 2.8 | 2.8 | 2 | 2.8 | 2.8 | 1 | 1.4 | 1.4 |
| Plant | 1 | 1.4 | 1.4 | 1 | 1.4 | 1.4 | 1 | .8 | .8 |
| Total | | 6.9 | 8.2 | | 6.9 | 8.2 | | 3.9 | 2.9 |
| Cultivate and hoe | | | | | | | | | |
| Cultivate | 4 | 5.4 | 5.4 | 4 | 5.4 | 5.4 | 4 | 2.7 | 2.7 |
| Hoe and chop | 1 | 2.0 | 2.0 | 1 | 2.0 | 2.0 | 1 | 2.0 | |
| Total | | 7.4 | 7.4 | | 7.4 | 7.4 | | 4.7 | 2.7 |
| Harvest[1] | 1 | 3.0 | 4.2 | 1 | 3.0 | 4.2 | 1 | 2.0 | 2.0 |
| Total all operations | | 17.3 | 19.8 | | 17.3 | 19.8 | | 10.6 | 7.6 |

[1] Based on yield of 20 bushels of corn.
[2] Harvesting usually done with 2-[illegible] unit. Yield [illegible] bushels per acre.

Although thinned and chopped by hand, corn does not have serious hand-labor peaks comparable to cotton, and lends itself better to large-scale production methods. A large proportion of the corn crop on plantations is produced with wage labor and large equipment. On the 12 plantations with 5-year records, an average of 54 percent of the total wage and share-rented cornland was operated with wage labor.

The periods during which various operations usually are performed on corn and the distribution by months of the labor and power used per acre are shown in figure 15. Corn does not conflict with cotton for labor, power, and equipment during land preparation, since this usually may be done over an extended period when field work is not pressing. But conflicts do occur both during cultivation and harvest. Cotton usually takes precedence over corn in such cases and receives first attention. This lack of timeliness in doing needed field work sometimes results in lower corn yields than would otherwise be obtained. In most years, however, conditions are such that cotton and

the relatively smaller acreage in corn can be produced without material neglect or detriment to either crop.

Corn usually is interplanted with soybeans, and occasionally with cowpeas or some other legume. Corn and the interplanted legume are planted in alternate hills in one operation, and no more labor is required than if corn were grown alone. The soybeans or other legumes are turned under after corn is harvested as the first step in the preparation of the land for the following crop. Very little of the

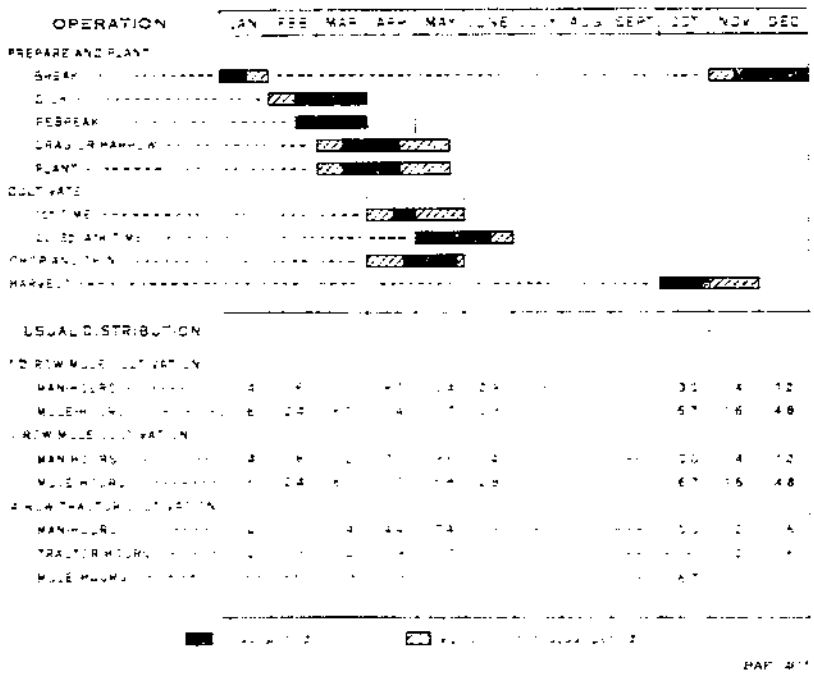



FIGURE 15.—Periods during which operations are performed on corn, and usual distribution, by months of man labor, mule work, and tractor work per acre.

legumes grown in corn is saved for hay because of the difficulty involved in harvesting.

### OATS

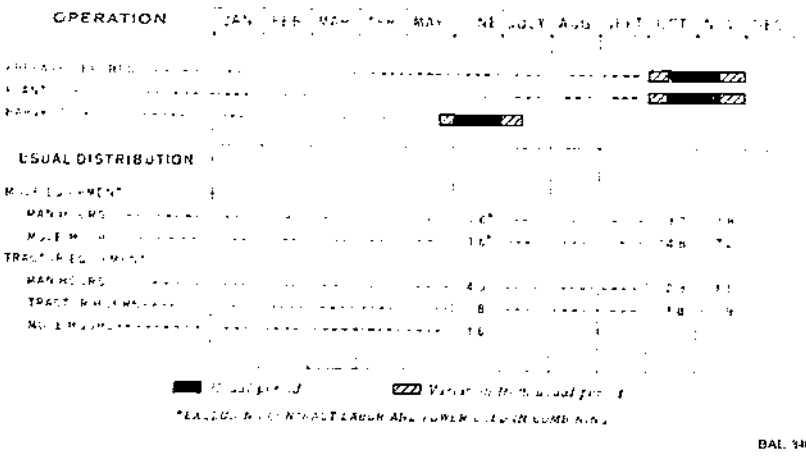
Oats require little labor compared with corn. An average of almost 7 man-hours normally is used in producing an acre of oats with a tractor and combine harvester compared with an average of almost 25 man-hours used in producing an acre of corn with a tractor (tables 28 and 29). Furthermore, as indicated from a comparison of figures 14, 15, and 16, oats do not conflict with cotton so seriously for labor, power, and equipment as does corn. Oats usually are planted in late October or early November when cotton harvesting normally is drawing to an end, and are harvested in June. There is considerable conflict with cotton in June, but this usually is serious only in years when unfavorable weather conditions have retarded the timeliness of field work on cotton.

TABLE 29. *Usual operations, and man labor and power used per acre in producing oats for grain with 2 common power and equipment units*

| Operation | Mule equipment | | | Tractor equipment | | |
|---|---|---|---|---|---|---|
| | Times over | Total time per acre | | Times over | Total time per acre | |
| | | Man | Mule | | Man | Tractor |
| | *Number* | *Hours* | *Hours* | *Number* | *Hours* | *Hours* |
| Prepare and plant: | | | | | | |
| Disk | 2 | 4.0 | 16.0 | 2 | 1.5 | 1.5 |
| Harrow | 1 | .7 | 2.8 | 1 | .5 | .5 |
| Plant | 1 | .8 | 3.2 | 1 | .7 | .7 |
| Total | | 5.5 | 22.0 | | 2.7 | 2.7 |
| Harvest: | | | | | | |
| Combine | 1 | [illegible] | [illegible] | 1 | 2.1 | [illegible] |
| Haul to barn | 1 | 1.6 | 1.6 | 1 | 1.6 | .8 |
| Total | | 1.6 | 1.6 | | 1.6 | .8 |
| Total, all operations | | 7.1 | 23.6 | | 6.7 | [illegible] |

[1] Based on yield of 35 bushels of oats.
[2] Contract labor, power, and equipment.
[3] 6-foot combine.
[4] Haulm to barn usually done with 2-mule team. Approximately 1.5 mule-hours are used per acre.

In view of the relative amounts and distribution of labor and power on corn and oats, and of the relative yields of the two crops, the question logically arises as to why oats have not been more important as a source of feed grain in the agriculture of the area. Census data




BAL. 9852

FIGURE 16. Periods during which operations are performed on oats and usual distribution by months of man labor, mule work, and tractor work per acre.

indicate that there were 78 acres in corn for every acre in oats harvested for grain in the area in 1934. Of the several factors contributing to the relative unimportance of oats as compared with corn, the major ones are the special equipment required for the production of oats, the ability of corn to outyield oats on land with slow drainage, and the frequent inability to follow cotton with fall oats on the same land because of a late cotton harvest.

Corn in large measure is supplementary to the cotton enterprise, despite the conflicts in labor and power needs already mentioned. The acreage in corn usually is small compared with the acreage in cotton, and the same work stock and equipment generally are used on both crops. The production of oats, on the other hand, requires a considerable investment in special equipment such as binders and threshers or the combines now commonly used, or expenses for contract harvesting. The acreage in oats seeded by small operators or tenants usually is too limited to justify the purchase of such equipment. Similar considerations apply on larger plantations on which tenants produce a substantial part of the feed grains.

It is probable that an increase in wage operations may result in an increase in oats relative to corn to meet feed-grain needs on plantations, unless increased wage operations are associated with increased mechanization and a decreased need for work-stock feed. Under such conditions, it is unlikely that oats would be grown as an important commercial enterprise in competition with cotton.

### SOYBEANS FOR SEED

Soybeans grown in the area may be grouped into two major categories—large-seed and small-seed varieties. The large-seed varieties produce a bushy stalk that is too coarse-stemmed for very desirable hay, but the yield of seed under local conditions is considerably higher than in the case of the small-seed varieties. The small-

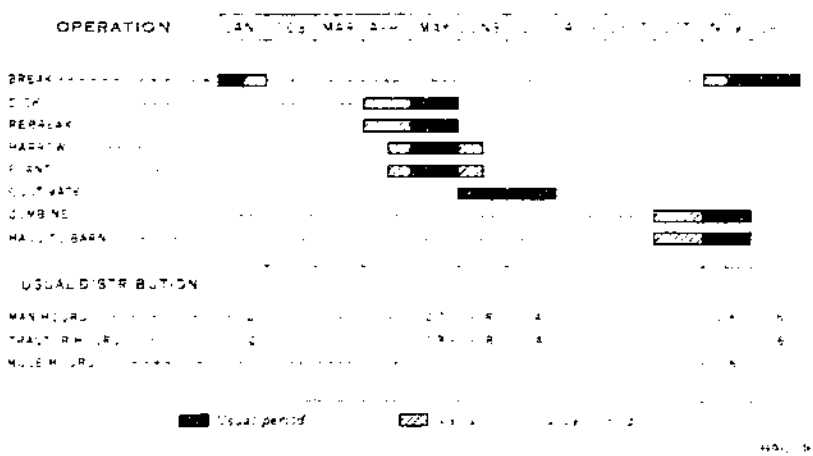



FIGURE 17.—Periods during which operations are performed on soybeans for seed, and usual distribution by months of man labor, mule work, and tractor work (tractors).

seed varieties, on the other hand, produce an abundance of relatively fine-stemmed vines.

Consequently, the soybeans grown commercially for seed are principally of the large-seed varieties, while those grown for hay usually are of the small-seed varieties. The principal large-seed varieties grown on these plantations were Mamloxi, Delsta, and Mamredo.

Although soybeans are one of the principal hay crops, the commercial production of beans has not been important. On the basis of

production data from the United States census and an assumed yield of 15 bushels per acre, it is estimated that approximately only 4 percent of the soybean acreage in the area was harvested for seed in 1934. The commercial production of soybean seed has been relatively unimportant because of the greater comparative advantage in producing cotton. On the basis of normal yields of 350 pounds of lint cotton and of 15 bushels of soybean seed per acre, the relative prices of the two commodities have not favored soybeans sufficiently to justify a material expansion in the latter.

Some planters have found it profitable to obtain special equipment and engage in the enterprise on a commercial basis, but their production of beans usually has been sold for planting seed at prices substantially higher than prevail in surplus-producing areas or than are paid for oil milling. This local price advantage in a seed-deficit area would be lost if production were to exceed the local demand for planting seed and the surplus production were sold for processing. That would further reduce the competitive position of the soybean-seed enterprise as compared with cotton.

TABLE 30.—*Usual operations, and man labor and power used per acre in producing soybean seed with a tractor and combine*

| Operation | Times over | Total time per acre | | Operation | Times over | Total time per acre | |
|---|---|---|---|---|---|---|---|
| | | Man | Tractor | | | Man | Tractor |
| | Num-ber | *Hours* | *Hours* | | Num-ber | *Hours* | *Hours* |
| Prepare and plant: | | | | Harvest: | | | |
| Break | 1 | 2.0 | 1.0 | Combine[2] | 1 | 1.6 | .8 |
| Disk | 1 | .7 | .7 | Haul to barn | 1 | .8 | .6 |
| Rebreak | 1 | .3 | .3 | | | | |
| Harrow | 1 | .1 | .1 | Total | | 2.4 | 1.4 |
| Plant | 1 | 1.2 | .4 | | | | |
| | | | | Total, all operations | | 7.3 | 4.9 |
| Total | | 4 | 2.9 | | | | |
| Cultivate | 2 | 1.2 | 1.2 | | | | |

[1] Based on yield of 15 bushels of soybean seed for seed variety.
[2] 6-foot combine.
[3] Hauling to barn usually done with 2 mule teams. Approximately 1.5 mule-hours are used per acre.

Soybean seed usually is produced commercially only on plantations on which there are tractors and combines, hence the data in table 30 and figure 17 are based upon practices involving the use of such equipment. Approximately 7 hours of man labor, 5 hours of tractor work, and 1.5 hours of mule work are used per acre. The heaviest labor demands of the crop are in May, when land preparation is completed and planting is done, and in November, when harvesting is done. There is considerable conflict with cotton for labor and power during both of these periods.

### SOYBEANS FOR HAY

Annual legumes are the principal hay crops. Census data for 1934 show that approximately 65 percent of the harvested acreage in hay and forage sorghums in the 10 counties completely within the area was in annual legumes. Of the acreage in annual legumes harvested or grazed that year, 75 percent was in soybeans, 23 in cowpeas, and the

remainder in miscellaneous legumes like velvetbeans and peanuts. Data on hay-production practices are presented here for soybeans only because of the importance of the crop in the area, but the production practices, labor, and power used on crops like cowpeas and others with similar growth characteristics are not materially different.

Small-seed varieties of soybeans generally are planted for hay because of their relatively abundant vine growth and fineness of stalk as compared with the large-seed varieties. The principal small-seed varieties grown on the plantations studied were the Otootan and the Laredo. Soybeans for hay usually are grown alone.

The predominance of soybeans over alfalfa for hay production is explained by the greater adaptability of the former to a wide range of soil conditions. Satisfactory yields of soybean hay are obtained on practically any well-drained, productive soil in the area. Alfalfa, on the other hand, usually cannot be successfully grown on acid soils unless lime is added.

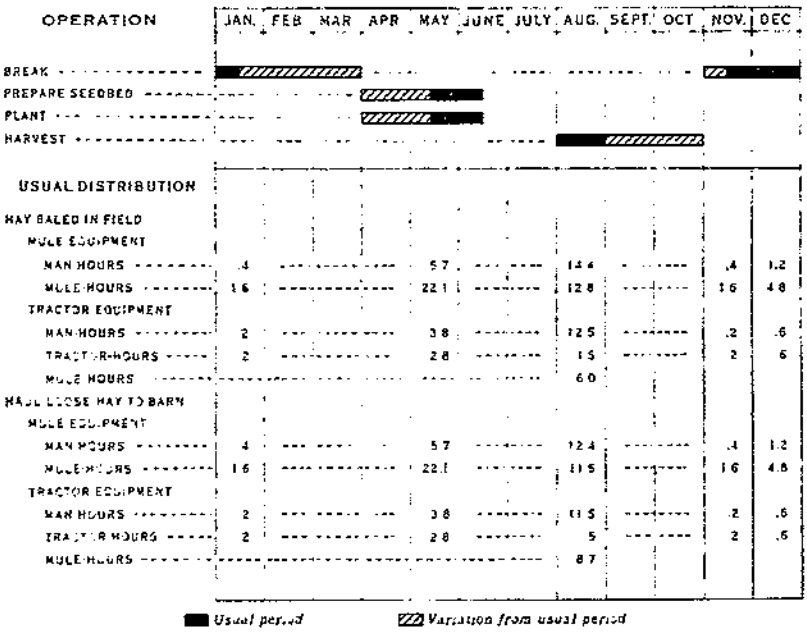
The usual production practices and amounts of labor and power used in producing an acre of soybean hay with mules and with tractors are shown in table 31. Data are shown both for hay baled in the field and for hay hauled loose to the barn. Soybean hay is baled for sale off the plantation or to provide for greater ease in storing. Relatively little soybean hay is produced commercially, although small surpluses occasionally are sold.

TABLE 31.—*Usual operations, and man labor and power used per acre in producing soybean hay, baled and loose, with 2 common power and equipment units*

| Operation | Mules and equipment | | | Tractor and equipment | | |
|---|---|---|---|---|---|---|
| | Time over | Total time per acre | | Time over | Total time per acre | |
| | | Man | Mule | | Man | Tractor | Mule |
| | *Number* | *Hours* | *Hours* | *Number* | *Hours* | *Hours* | *Hours* |
| Preparation of land: | | | | | | | |
| Plow | 1 | 1.0 | 3.0 | 1 | 1.1 | 1.0 | 3.3 |
| Disk | 2 | 4.0 | 16.0 | 2 | 1.2 | 1.5 | 3.0 |
| Harrow | 1 | .7 | 2.1 | 1 | .7 | .7 | 2.1 |
| Plant | 1 | 1.0 | 4.0 | 1 | 2.0 | 1.0 | 4.0 |
| Total | | 7.7 | 25.1 | | 4.8 | 4.2 | 12.4 |
| Harvest: | | | | | | | |
| Hay [illegible] | | | | | | | |
| Cut | 1 | 1.4 | 2.8 | 1 | .7 | .7 | 1.4 |
| Rake | 1 | 1.0 | 2.0 | 1 | 1.0 | | 2.0 |
| Bale in field | 1 | 2.0 | 4.0 | 1 | 1.0 | 1.0 | 2.0 |
| Haul | 1 | 1.0 | 2.0 | 1 | 1.0 | | 2.0 |
| Haul to barn | 1 | 4.0 | 4.0 | 1 | 4.0 | | 4.0 |
| Total | | 9.4 | 14.8 | | 7.7 | 1.7 | 11.4 |
| Hay [illegible] loose to barn: | | | | | | | |
| Cut | 1 | 1.4 | 2.8 | 1 | .7 | .7 | 1.4 |
| Rake | 1 | 1.0 | 2.0 | 1 | 1.0 | | 2.0 |
| Haul to barn | 1 | 20.0 | 6.7 | 1 | 20.0 | | 4.7 |
| Total | | 22.4 | 11.5 | | 11.7 | .7 | 8.1 |
| Total all operations, baled hay | | 32.1 | 42.9 | | 27.4 | 7.5 | 31.9 |
| Total all operations, loose hay | | 29.1 | 31.6 | | 19.5 | 4.4 | 24.8 |

[illegible] Based on yield of 1 ton of soybean hay.

The usual distribution by months of the labor and power used in producing soybean hay is shown in figure 18. There is considerable conflict in the labor demands of soybeans and other crops, but the critical operation of harvesting usually is performed before cotton picking starts and at a time when the labor demands of other crops are light.




BAE 39-4

FIGURE 18.—Periods during which operations are performed on soybean hay, and usual distribution by months of man labor, mule work, and tractor work per acre

## ALFALFA HAY

Alfalfa follows soybeans as the second most important hay crop. In 1934, 18 percent of the harvested area in hay and in forage sorghums in the 10 counties completely within the area was in alfalfa. Alfalfa is grown principally in the western part, in which soils generally are not acid. The plantations included in this study were located principally in the western part, thus accounting for the larger average acreage in alfalfa than in soybean hay in the average plantation organizations shown in table 8.

The usual operations and amounts of labor and power used in producing an acre of alfalfa hay with mule equipment and with tractor equipment are shown in table 32. One seeding of alfalfa usually suffices for 3 years. Data are shown both for baled hay and for hay stored loose. As in the case of soybean hay, alfalfa hay is baled for sale off the plantation or because of limited storage facilities. Alfalfa seed is seldom saved here because of unfavorable climatic conditions. Practically all of the seed planted is from Kansas and Oklahoma.

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FIGURE 19. Baling alfalfa hay in the field. Alfalfa hay is baled for sale or because of limited storage facilities.

TABLE 32.—*Usual operations, and man labor and power used per acre in producing alfalfa hay, baled and loose, with 2 common power and equipment units*

| Operation | Mule equipment | | | Tractor equipment | | | |
|---|---|---|---|---|---|---|---|
| | Times over | Total time per acre | | Times over | Total time per acre | | |
| | | Man | Mule | | Man | Tractor | Mule |
| | *Number* | *Hours* | *Hours* | *Number* | *Hours* | *Hours* | *Hours* |
| Prepare and plant: | | | | | | | |
| Disk | 3 | 6 0 | 21 0 | 3 | 2 0 | 2 0 | |
| Drag or harrow | 2 | 2 0 | 8 0 | 2 | 1 0 | 1 0 | |
| Plant | 1 | 1 0 | | 1 | 1 0 | | |
| Total | | 9 0 | 32 0 | | 4 0 | 3 0 | |
| One-third of total per year [1] | | 3 0 | 10 7 | | 1 3 | 1 0 | |
| Harvest: [2] | | | | | | | |
| Hay baled in field | | | | | | | |
| Cut | 4 | 5 6 | 17 2 | 4 | 2 0 | 2 0 | |
| Rake | 4 | 4 0 | 8 0 | 4 | 4 0 | | 8 0 |
| Push hay to baler | 4 | 6 7 | 17 4 | 4 | 2 0 | 2 0 | |
| Bale | 4 | 12 0 | | 4 | 12 0 | | |
| Haul to barn | 4 | 8 0 | 8 0 | 4 | 8 0 | 1 | 8 0 |
| Total | | 36 3 | 40 6 | | 28 0 | 4 0 | 16 0 |
| Hay hauled loose to barn | | | | | | | |
| Cut | 4 | 5 6 | 11 2 | 4 | 2 0 | 2 0 | |
| Rake | 4 | 4 0 | 8 0 | 4 | 4 0 | | 8 0 |
| Bunch | 4 | 2 7 | 5 4 | 4 | 2 7 | | 5 4 |
| Haul to barn | 4 | 20 0 | 13 3 | 4 | 20 0 | | 13 3 |
| Total | | 32 4 | 37 9 | | 28 7 | 2 0 | 26 7 |
| Total all operations, baled hay | | 39 3 | 51 3 | | 29 3 | 5 0 | 16 0 |
| Total all operations, loose hay | | 35 3 | 18 6 | | 30 0 | 3 0 | 29 7 |

[1] 1 seeding usually suffices for 3 years of production.
[2] Based on annual yield of 2 tons of alfalfa hay

The period during which various operations are performed and the usual distribution by months of the amounts of labor and power normally used in producing an acre of alfalfa are shown in figure 20.

As seedbed preparation and planting usually need to be done only once in 3 years, these operations do not compete seriously with other enterprises for labor and power. Alfalfa usually is cut four times a year, however, and is cut at times that conflict with operations on other crops, particularly cotton. As alfalfa hay is grown in relatively small acreages for home needs, its production can be coordinated fairly well with cotton production so that neither crop suffers from

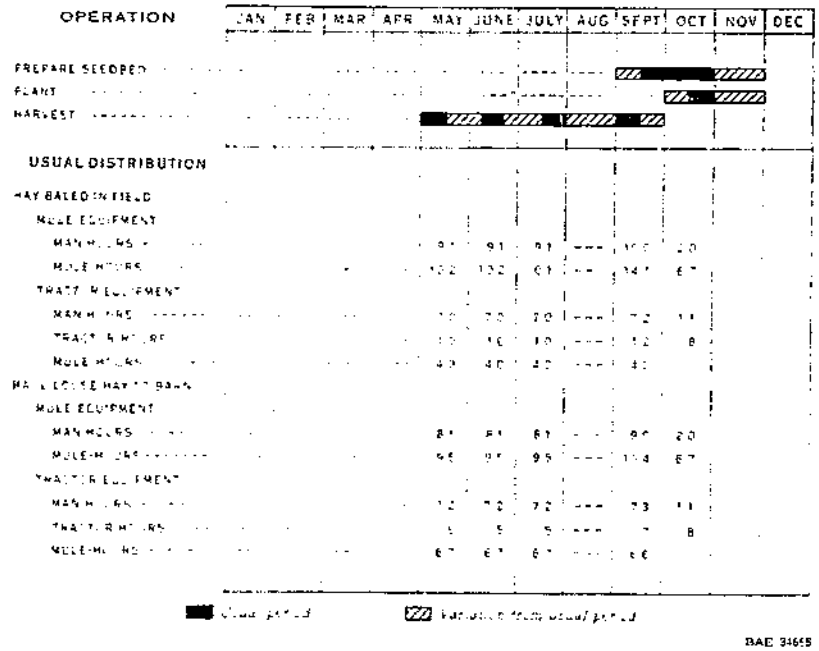



FIGURE 20.—Periods during which operations are performed on alfalfa hay, and usual distribution by months of man labor, mule work, and tractor work per acre.

the combination except in years of unfavorable weather that interferes with the timeliness of production operations.

Alfalfa acreage in the 10 counties completely within the area increased from 19,376 acres in 1929 to 37,607 in 1934, or 94 percent. A large proportion of this increase was attributable to the cotton-acreage-reduction program of the Agricultural Adjustment Administration. Alfalfa is produced for sale on some plantations, but in general the crop is grown mainly for plantation use. In 1934, despite the large reduction in cotton acreage, only 2 percent of the total cropland in the 10 counties completely within the area was in alfalfa.

Alfalfa has certain advantages that make it a potential cash crop in this area. Under favorable conditions of soils, drainage, and production practices, yields over a period of years may average as high as 3 tons or more to the acre. Labor demands of the crop also are relatively light compared with cotton. On the other hand, frequent seasons of high rainfall may interfere with curing. This may result

in occasional crop losses or in relatively low-grade hay as compared with the production in regions with more favorable weather conditions. Another limiting factor, already discussed in connection with certain other enterprises, is the greater comparative advantage in cotton production on the basis of average yields and prices that have prevailed. Furthermore, the area normally did not produce sufficient hay to provide for its needs before the cotton-acreage-reduction programs, and local alfalfa prices were considerably above prices that prevailed in surplus-producing regions. An expansion of alfalfa production sufficiently large to cause a loss of this local price advantage would reduce further the relative income from alfalfa produced for sale as compared with cotton.

### SAGRAIN-SOYBEAN PASTURE

Sagrain and interplanted soybeans are grown for late summer and fall pasture. The practice is not widely followed at present, but it has certain advantages that encourage its adoption and expansion.

Both sagrain and soybeans are adapted to practically all of the soil types in the area, and produce crops under widely varying moisture conditions. Moreover, there is a rather wide range of time during which these crops may be planted, and both crops thrive despite lack of timeliness in cultivation operations. Usually, sagrain and soybeans are planted about the first part of June so that work stock can be pastured on them from about August 15, or as soon as possible after the cultivating season is over, until about December 1. One and one-half acres of sagrain-soybean pasture usually will carry a mule from August 15 to December 1 without supplementary feed.

Sagrain-soybean pastures generally are superior to permanent grass pastures for work-stock maintenance. The former provide a pasture of relatively high carrying capacity at a period when most needed for work stock. Although available during a greater part of the year, permanent grass pastures are used only to a limited extent by work stock during the crop-production season, and are outyielded by sagrain-soybean pastures during the period when pasturage is most needed. Furthermore, in addition to the fewer acres needed during the grazing season, sagrain-soybean pastures provide a better-balanced maintenance ration than do permanent grass pastures.

TABLE 33.—*Usual operations, and man labor and power used per acre in producing sagrain-soybean pasture with 3 common power and equipment units*

| Operation | Two-mule cultivation | | | Two-mule cultivation | | | Tractor cultivation | | |
|---|---|---|---|---|---|---|---|---|---|
| | Times over | Total time per acre | | Times over | Total time per acre | | Times over | Total time per acre | |
| | | Man | Mule | | Man | Mule | | Man | Tractor |
| | *Number* | *Hours* | *Hours* | *Number* | *Hours* | *Hours* | *Number* | *Hours* | *Hours* |
| Prepare and plant: | | | | | | | | | |
| Break | 1 | 2.0 | 8.0 | 1 | 2.0 | 8.0 | 1 | 1.0 | 1.0 |
| Rebreak | 1 | 1.7 | 6.8 | 1 | 1.7 | 6.8 | 1 | 1 | 1 |
| Drag or harrow | 1 | .4 | 1.4 | 1 | .4 | 1.4 | 1 | 1 | 1 |
| Plant | 1 | .4 | 1.4 | 1 | .4 | 1.4 | 1 | .8 | 1 |
| Total | | 4.5 | 17.6 | | 4.5 | 17.6 | | 2.6 | 2.2 |
| Cultivate | 3 | 2.1 | 6.3 | 3 | 1.6 | 6.2 | 3 | 1.2 | 1.2 |
| Total, all operations | | 11.6 | 23.7 | | 11.1 | 23.8 | | 3.8 | 3.4 |

The usual operations and amounts of labor and power used per acre in producing sagrain-soybean pastures with three common power and equipment units are shown in table 33. The periods during which each operation is performed and the usual distribution by months of the amounts of labor and power used per acre are shown in figure 21.

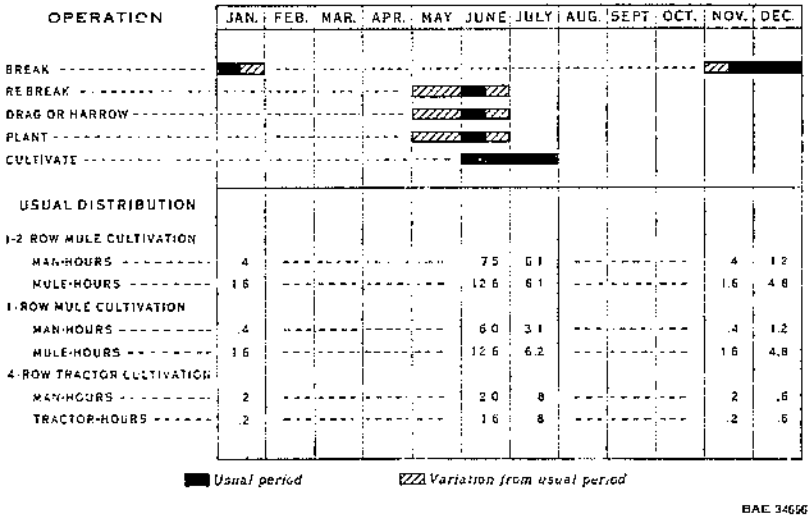



FIGURE 21.-- Periods during which operations are performed on sagrain-soybean pasture, and usual distribution by months of man labor, mule work, and tractor work per crop acre.

### WINTER LEGUMES

Winter legumes to be turned under for soil improvement fit well into the highly specialized system of cotton farming usually practiced here. In most years, winter legumes can be planted in the fall following the cotton harvest, and can be turned under the following spring before the planting of cotton or other crops on the same land. The periodical turning under of a good growth of winter legumes provides nitrogen—the fertility element most commonly deficient in soils of the area—and furnishes humus which is often seriously lacking in the older soils that have been cropped continuously to cotton, corn, or other soil-depleting crops.

Commercial fertilizers are not used on crops following winter legumes turned under. On soils in which humus deficiency is not a problem, the choice of commercial fertilizers or of legumes is conditioned largely by the relative prices of fertilizer and of legume seed.

To permit timely decay and incorporation into the soil, winter legumes usually are turned under at least 2 weeks before cotton is planted. There is some risk, therefore, that unfavorable weather conditions may delay the operation and retard unduly the planting of cotton. Then, too, the damage to cotton stands by cutworms is often greater where winter legumes have been turned under.

To minimize the risk of delayed cotton planting, the proportion of the cotton acreage preceded by a winter legume usually is determined by the power available to prepare land for planting. On the plantations studied, it was considered that the power available would per-

mit approximately one-third of the cotton acreage to be preceded by a winter legume without great danger of being too rushed in preparing land for cotton.

The operations shown in table 34 represent the practices usually followed when the crop preceding winter legumes is harvested before November 1. In this area winter legumes ordinarily are not planted later than November 15. The system shown in the table provides a good seedbed for the cover crop and assures thorough preparation for the next year's crop.

TABLE 34.—*Usual operations, and man labor and power used per acre in preparing land and planting winter legumes to be turned under*

| Operation | Mule equipment | | | Tractor equipment | | |
|---|---|---|---|---|---|---|
| | Times over | Total time per acre | | Times over | Total time per acre | |
| | | Man | Mule | | Man | Tractor |
| Prepare and plant: | *Number* | *Hours* | *Hours* | *Number* | *Hours* | *Hours* |
| Cut stalks, or disk | 1 | 2.0 | 4.0 | 1 | 0.7 | 0.7 |
| Break | 1 | 2.0 | 4.0 | 1 | 1.0 | 1.0 |
| Harrow or drag | 1 | 1.4 | 1.4 | 1 | .4 | .4 |
| Plant | 1 | 1.4 | 1.4 | 1 | 1.2 | .4 |
| Total | | 6.8 | 10.8 | | 3.3 | 2.5 |

But cotton harvesting may not always be completed in time to permit the breaking and preparation of land for a winter cover crop (figs. 14 and 22). In such years, the cover crop is planted on the old

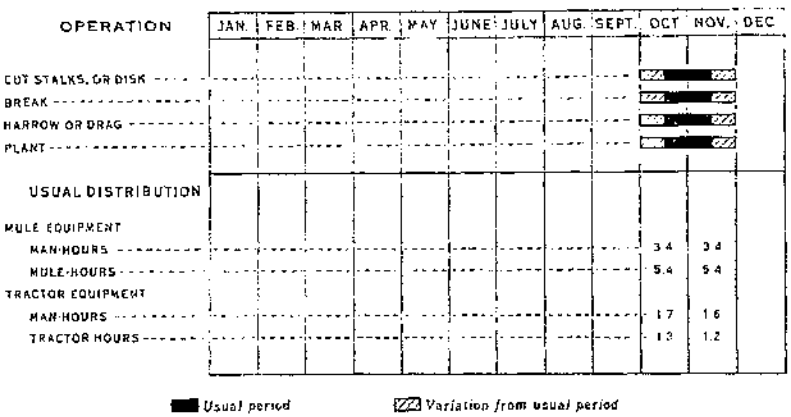



FIGURE 22.—Periods during which operations are performed on winter legumes, and usual distribution by months of man labor, mule work, and tractor work per acre.

cotton bed without prior preparation. This operation usually is performed by one man using a one-mule spout-planter equipped with a small lister to cover the seed. Such an outfit usually will plant from 6 to 7 acres in a 10-hour day.

In both this system and the one shown in table 34, the cover crop usually is disked in and plowed under the following spring as the first step in preparing land for the following crop (fig. 23). Rebreaking is not done in preparing land for crops following winter legumes turned under.

A favorable growth usually is obtained from the winter legumes commonly planted in this area. Observations at the Delta Branch Experiment Station indicate that a crop of winter legumes yielding

BAE 36140

FIGURE 23.—Disking-in Austrian Winter peas. The turning under of these peas and other winter legumes has become a widespread practice. Winter legumes usually are disked in before the land is broken in preparation for cotton planting.

1 ton of dry matter ordinarily will furnish approximately 30 pounds of nitrogen for plant growth during each of 2 succeeding years. Austrian Winter peas and Hungarian vetch were the most common winter legumes grown on the plantations, although hairy vetch and bur-clover also were important.

### SUMMARY COMPARISON OF DISTRIBUTION OF LABOR USED FOR CROP PRODUCTION

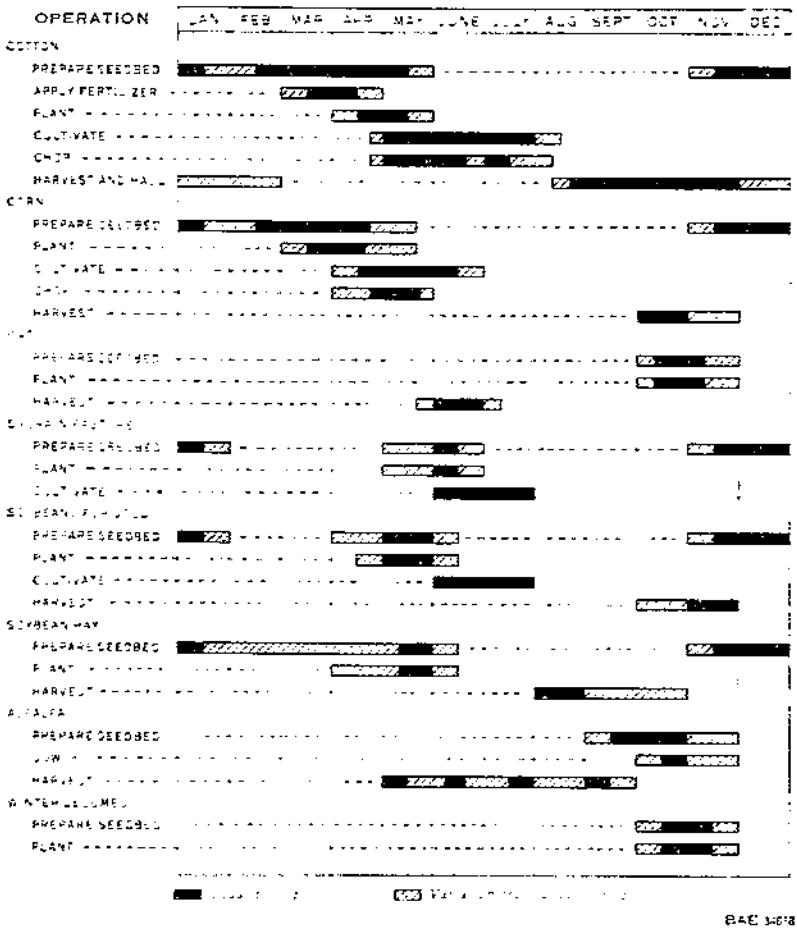
Attention has been called to the conflicts for labor and power as between various crops grown on the plantations. The periods during which various tasks are performed on individual crops are shown in summary form in figure 24. This permits ready comparison of the conflicts that may exist as between different crops in their demands for the use of labor, power, and equipment.

It is to the plantation operator's advantage so to organize his production program that he will obtain the maximum economic use of his labor, power, and equipment. This usually is conditioned, on these plantations, by the greater comparative advantage of cotton

over other enterprises generally adapted, and by the consequent economic advantage of devoting a large proportion of the cropland to cotton production.

As practiced in this area, the operator of a cotton plantation finds it advantageous, other conditions being equal, to combine with cotton those crops that conflict the least with cotton in their demands for labor, power, and equipment.

All the important crops in the area for which information is shown in figure 24 are competitive to some extent with cotton, but in the




BAE 3-58

FIGURE 24.—Summary comparison of periods when operations are performed on crops.

main, they usually are produced in relatively small quantities for plantation use and, in effect, are supplementary to the cotton enterprise. The competition between cotton and other enterprises would become serious if one or more of the crops alternative to cotton were expanded. Then decision would have to be made by the plantation operator as to whether or not the resulting reduction in cotton acreage could be offset by increased benefits to the plantation as a whole.

MAINTENANCE OF WORK STOCK, TRACTORS, AND EQUIPMENT

The quantities of feed and amounts of other cost items normally used per mule per year in maintaining work stock and mule-drawn equipment are shown in the following tabulation, which is largely self-explanatory.

| | |
|---|---|
| Maintenance of work stock, per mule: | |
| Feed: | |
| Corn or its equivalent [1] | 65 bushels. |
| Hay (primarily legume) | 3.5 tons. |
| Pasture | 0.25 acre. |
| Other costs: | |
| Hostler | $7.50. |
| Depreciation [2] | $22.00. |
| Miscellaneous [3] | $1.50. |
| Maintenance of mule-drawn machinery, per mule: | |
| Repair [4] | $12.00. |
| Depreciation [5] | $9.00. |
| Work performed per mule [6] | 120 days. |

[1] Oats are sometimes substituted for an equal weight of corn.
[2] 12½ percent of present estimated value of 5-year-old mule weighing approximately 1,100 pounds.
[3] Veterinary fees, medicine, salt, etc.
[4] Includes current purchases of plow gear.
[5] 15 percent of original value.
[6] Approximately 85 percent on crops, 10 hauling wood for tenants, and 5 on miscellaneous plantation work.

On the basis of the long-time average yields shown in table 26, the maintenance of an 1,100-pound mule such as is usually found on these plantations would require the production from approximately 3¼ acres in corn, 3½ acres in soybean hay, or 1¾ acres in alfalfa hay, and a small acreage in pasture. Altogether, approximately 5¼ to 7 acres of land would be required to produce the necessary feed for one head of work stock. Costs other than feed include the hostler's wages, depreciation on work stock, and the value of miscellaneous items like salt, veterinary fees, and medicine. Expenses on mule-drawn equipment, including repairs and depreciation, are shown on a per-mule basis.

Of the 120 days normally worked per mule per year, approximately 100 were devoted to crops, 12 were spent in hauling wood for tenants, and 8 were for miscellaneous plantation work, principally hauling.

The usual quantities of fuel and lubricants and the amounts of other cost items in maintaining a 10 20-horsepower tractor and tractor equipment for 1 year are shown in the following tabulation. The tractor equipment for which estimates are shown includes a 2-row middlebuster, disk, 4-row planter, and 4-row cultivator. Gasoline was practically the only fuel used in tractors on the plantations studied. An average of one hundred 10-hour days was worked per tractor per year.

| | |
|---|---|
| Fuel and lubricants: | |
| Fuel [1] | 2,000 gallons. |
| Oil | 250 quarts. |
| Grease | 100 pounds. |
| Repairs: | |
| Tractor | $100.00. |
| Tractor equipment | $50.00. |
| Depreciation: [2] | |
| Tractor | $165.00. |
| Tractor equipment | $55.00. |
| Work performed per tractor [3] | 1,000 hours. |

[1] Gasoline was practically the only tractor fuel used on the plantations studied.
[2] 15 percent of original value.
[3] Practically all tractor work on the plantations studied was for drawbar operations.

### GENERAL AND OVERHEAD EXPENSES

General and overhead expenses constitute an important element in plantation operation. These expenses are considered here because certain of them vary significantly as between different systems of plantation organization. In addition to the maintenance of power and equipment just discussed, general and overhead expenses include charges for taxes, automobile, supplies, buildings, and miscellaneous overhead items and labor. Data on these items are derived from records on the plantations studied, but have wide applicability in the area on other one-unit plantations of from 400 to 800 crop-acres. Unusually small or very large plantations may have higher or lower rates for expenses on buildings.

Furthermore, cash outlays in connection with general or overhead expenses will vary from year to year with changes in prices; hence, modification would need to be made if prices digressed significantly from those used here.

The relative rates determined from the study are as follows:

| | *Dollars* |
|---|---|
| Taxes | 2.00 per crop-acre. |
| Automobile | .40 per crop-acre. |
| Supplies (picking sacks, files, hoes, etc. | .10 per crop-acre for wage crops.<br>.20 per crop-acre for sharecropper crops. |
| Headquarters buildings and improvements (excluding manager's or owner's residence) | .32 per crop-acre. |
| Tenant or labor houses and improvements | 27.00 per family. |
| Miscellaneous | .40 per crop-acre. |

Taxes include real-estate and personal-property taxes, excluding the automobile. Automobile expenses include the proportion of the value of the automobile fuel, lubricants, repairs, depreciation, and taxes chargeable to the plantation business. Expenses for supplies are less on share crops than on wage crops, for tenants usually furnish their own picking sacks and small tools. The expenses on the headquarters and tenant buildings and improvements include repairs, depreciation, and insurance. During the period of the study, expenses for repairs and depreciation on plantation buildings averaged 4 and 5 percent, respectively, of the average valuation of the buildings. In addition to the labor used directly in production and that included in expenses for repairs, considerable labor is used for various operations that cannot well be prorated to any one enterprise. On the plantations studied, approximately 20 hours of man labor per head of work stock were spent in hauling manure, 1 hour per crop-acre was spent in ditching, and 1 hour per crop-acre was spent in miscellaneous tasks. The amount of such labor does not vary significantly between different systems of plantation organization, but consideration is given to this factor in the budget analysis given later.

### PRICES PAID AND RECEIVED

A primary consideration in successful plantation management is the ability correctly to appraise for a period of time in the future the probable direction of prices and the probable price relationships of various items to be bought and sold. For example, prospectively

high feed prices in relation to cotton prices may indicate the desirability of raising rather than of purchasing feed for work stock. Likewise, the level of prices likely to prevail may influence the amount of credit that may safely be advanced to tenants, as well as the general scale of plantation expenses for items like fertilizer and repairs.

A careful appraisal of prospective prices and price relationships enables the plantation operator to take a forward-looking approach in plantation management rather than using the last year's prices as a criterion of income expectancy the following season.

The price relatives shown in the following tabulation are used later in this bulletin in evaluating the economic merits of various adapted systems of plantation organization and operation. These prices are not forecasts, but represent simply the long-time relationships that have prevailed in this area as between the prices of cotton and of other items usually bought and sold.

| | *Price per unit* |
|---|---|
| Purchases: | |
| Labor: | |
| Wage labor, per day | $1.00 |
| Cotton picking, per hundredweight[1] | .90 |
| Planting seed: | |
| Cotton, per ton | 75.00 |
| Alfalfa, per pound | .20 |
| Soybeans (small-seed varieties), per bushel | 3.00 |
| Soybeans (large-seed varieties), per bushel | 1.50 |
| Sagrain, per hundredweight | 4.00 |
| Austrian Winter peas, per hundredweight | 5.00 |
| Hungarian vetch, per hundredweight | 6.00 |
| Feed: | |
| Corn, per bushel | .80 |
| Oats, per bushel | .50 |
| Alfalfa hay (baled), per ton | 15.00 |
| Soybean hay (baled), per ton | 12.00 |
| Materials and supplies: | |
| Fertilizer (nitrogenous), per ton | 32.00 |
| Poison (calcium arsenate), per ton | 120.00 |
| Tractor gasoline, per gallon | .12 |
| Tractor oil, per gallon | .50 |
| Tractor grease, per pound | .10 |
| Services: | |
| Ginning, per hundredweight[1] | .30 |
| Bagging and ties, per bale | 1.50 |
| Sales: | |
| Cotton lint, per pound | .12 |
| Cottonseed, per ton | 25.00 |
| Cropper supervision, commissions, and interest, per cropper cotton acre | 1.50 |

[1] Hundredweight of seed cotton.

The plantation operator who is estimating the probable returns from alternative production programs should use prices in accordance with the situation likely to prevail at some given time in the future. Current information on factors influencing agricultural prices may be obtained from outlook reports issued periodically by the United States Department of Agriculture in cooperation with State agricultural colleges. Copies of these reports may be obtained from county agents or directly from the Office of Information, United States Department of Agriculture, Washington, D. C.

The local production of feed and seed other than cotton seed usually is insufficient to meet the demand in this area and in the wider region

of which the area is a part. Consequently, the prices of these items usually are considerably higher in this area than in the main feed- and seed-producing areas.

This fact is an important consideration in evaluating the commercial possibilities of alternatives. An increase in feed and seed production sufficiently large to convert the area from a deficit to a surplus area would result in relatively lower local prices of feed and seed than would prevail under conditions of deficit production.

### RELATIVE RETURNS FROM CROPS

Joint with physical considerations in planning the organization and operation of plantations, already discussed, is the factor of relative returns from various adapted enterprises. The net values per acre yielded by various enterprises are valuable in indicating the relative income potentialities of these enterprises. Thus of two crops interchangeable in respect to labor and power needs and to their contribution to soil productivity, the operator should select the one that will return the highest net value per acre. In general, however, the inclusion of particular enterprises in the plantation organization should be dependent not only upon their net returns per acre, but also upon the manner in which these enterprises are interrelated with each other, and upon their effect on the earnings of the entire plantation business.

This may be illustrated with data pertaining to the returns from various crops as determined from the production and price information contained in the preceding parts of this bulletin.

Data in table 35 are based upon the normal yields and usual amounts of labor, power, and other production items used per acre for various crops, and upon the price relatives that have prevailed in this area. The gross cash values per acre for various crops, for example, are based upon the normal yields shown in table 26 and upon the price relatives shown in the preceding tabulation. Likewise, power and equipment costs represent the values of the feed, fuel, repairs, depreciation, and other items shown in the tabulations on page 74, at the prices shown in the tabulation on page 76. The expense data shown for each crop except soybean seed represent averages for mule operations and tractor operations, but the relative expenses as between crops for each power system used alone would not be substantially different. Data on soybean seed are shown for tractor operations only, since other production practices were not common. Costs are shown only for the major variable items as between crops; costs like taxes, insurance, repairs and depreciation on buildings, would not vary appreciably as between crops, and would not affect the relative returns indicated.

On the basis of the production data and prices used, the highest returns per acre after deducting the variable costs indicated were obtained from cotton. The next highest returns per acre, in order of relative importance, were obtained from alfalfa hay, soybeans for seed, oats, corn, and soybeans for hay. As between corn and oats, the principal feed grains on plantations, the returns per acre from oats were slightly larger. As between alfalfa and soybean hay, the principal roughage crops, the returns from alfalfa were much larger. These relative returns from various crops would be affected, of course, by changes in yields and prices.

TABLE 35.—*Relative cash values per acre for various crops*

| Item | Cotton | Corn | Oats | Soybeans for seed | Soybean hay | Alfalfa hay |
|---|---|---|---|---|---|---|
| Normal yield | Lint, 350 pounds<br>Seed, 714 pounds | 20 bushels | 37 bushels | 15 bushels | 1 ton | 2 tons |
| Relative price [1] | Lint, 12 cents per pound<br>Seed, $25 per ton | $0.80 | $0.90 | $1.50 | $12.00 | $15.00 |
| Gross cash value per acre | | $16.00 | $17.50 | $22.50 | $12.00 | $30.00 |
| Cost per acre for labor, power, equipment, materials, and services | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Labor [2] | 15.41 | 2.91 | .81 | .73 | 1.97 | 3.43 |
| Power [2] | 5.97 | 3.65 | 2.77 | 2.86 | 1.14 | 5.07 |
| Machinery and equipment [2] | .87 | .62 | 1.92 | 2.04 | 1.17 | 2.35 |
| Seed and inoculation [3] | .75 | .11 | 1.25 | .85 | 3.20 | 1.67 |
| Fertilizer and poison [3] | 2.76 | .00 | .00 | .00 | .00 | .00 |
| Sacks, baling wire, and miscellaneous supplies | .10 | .00 | .75 | .75 | .00 | .80 |
| Ginning | 1.43 | .00 | .00 | .00 | .00 | .00 |
| Total | 29.29 | 7.45 | 7.29 | 7.23 | 11.18 | 13.32 |
| Gross cash value minus specified costs | 2.71 | 8.65 | 10.21 | 15.27 | .82 | 16.68 |

[1] Normal yields and relative prices from tables 26 and p. 76, respectively.
[2] Labor, power, and equipment expenses for all crops except soybean seed are averages of mule operations and tractor operations. Data on soybeans produced for seed pertain to tractor operations only. In the case of cotton and corn, the averages are based on 1-row mule operations and 4-row tractor operations. (See tables 27 to 32, inclusive, and pp. 74 and 76.
[3] From table 26.

The relatively high returns from cotton, associated with the adaptability of the crop to the physical conditions and to the labor situation in the area generally, explain the predominant position of this crop over others. In practice, the cotton enterprise usually is the nucleus of the plantation organization, and the inclusion and extent of other enterprises are governed by the production conditions on individual plantations, and by the way in which these other enterprises fit into the cotton-production program. Oats yield a higher net return per acre than corn, for example, but are grown in relatively limited quantities compared with corn. This is explained largely by the more favorable interrelations of cotton and corn in the plantation organization than of cotton and oats. The turning under of interplanted legumes in corn often is depended upon, at least in part, to maintain soil productivity for cotton production. Then, too, corn is grown with the same power and equipment used on cotton, and usually without serious conflict. Likewise, alfalfa yields a much higher value per acre than soybean hay, but the latter is more extensively grown because it is adapted to a wider range of physical conditions, and fits better into a short-time rotation that is favorable to cotton.

It is evident from this that the relative net returns from individual crops do not furnish an adequate basis for planning cropping systems. But these relative returns are valuable in indicating the crop or crops in which specialization may be most remunerative. When decision on this is made, however, it may be found more economical to add other crops on the basis of their relations to the major enterprise rather than on the basis of the relative returns from individual crops. This point is developed more fully in the remainder of this bulletin.

## APPLICATION OF DATA IN PLANNING THE ORGANIZATION AND OPERATION OF PLANTATIONS

Information has been presented on crop yields and on the labor, power, and other items normally used in production; on the relative prices that have prevailed in the area; and on the physical conditions that influence the most advantageous proportionate combination of various enterprises in plantation organizations. The next and final step is to illustrate the use of these data in testing the relative economic merits of alternative plantation systems adapted to the area. In the remainder of this bulletin, a method of budgeting will be used to illustrate a procedure that may be used in doing this.

A plantation budget is a forward-looking management plan based on probable production and production costs, considering individual enterprises and the plantation as a whole, and on prices of items sold and purchased that are likely to prevail during a given period of time in the future. In arriving at a decision as to the system of plantation organization and operation to adopt, the operator should consider the various alternatives that are adapted to conditions on his own plantation, and then select the production program that appears most promising.

The economic choice between alternative operating systems will be the one that gives promise of returning the highest net income consistent with the upkeep of the soil and other production resources. Other considerations such as the plantation operator's likes or dislikes and his managerial aptitude may outweigh the purely economic objective of highest money returns. The choice of using work stock or tractors, for example, may be influenced largely by the operator's aptitude or personal preference.

In any event, the budgeting of alternative production programs furnishes the plantation operator with an understanding of the probable financial results from following alternative courses of action, and enables him better to avoid the mistakes and losses often attendant on the pursual of a hit-or-miss policy in plantation management.

In illustrating the use of the data in planning, a number of budgets are developed. The budgets presented are based on the usual yields and amounts of labor, power, materials, and other items used in production, as already indicated, and on the long-time price relationships shown on page 76. In developing an individual management plan, the plantation operator should use data that are directly applicable to his own plantation, and should estimate the price relatives that are likely to prevail during the period covered by his individual budget. As indicated later, differences in yields and in the relative prices used may result in different conclusions from those indicated in the budgets.

### DESCRIPTION OF BUDGETED PLANTATION SYSTEMS

In the budgets presented in tables 36, 37, 38, and 39, primary consideration is given to the relative economic advantages of purchasing or producing feed grains for work stock; of using share labor, wage labor, or a combination of the two; and of using mule power, tractor power, or a combination of the two. In analyzing these considerations, budgets are presented for seven systems. The data in table 36 show for each system the organization of the cropland operated with sharecroppers and with wage labor, the number of resident cropper

and wage-labor families, and the amounts of wage labor hired. The number of buildings, power units, and various kinds of equipment in each system are shown in table 37. The plantation operator's shares of commodities produced, purchased, and sold are shown in table 38. Lastly, a summary picture of the plantation investment, the plantation operator's share of receipts and expenses, and the net plantation income are shown in table 39.

A description of each system will indicate the considerations that entered in the formulation of the budgets.

TABLE 36.—*Land and labor organization, and amounts of wage labor hired in various plantation systems*

| Item | | Data for plantation system: | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | IA | IB | IIA | IIB | III | IVA | IVB |
| Plantation area | acres | 950 | 950 | 950 | 950 | 950 | 950 | 950 |
| Land in crops | do | 750 | 750 | 750 | 750 | 750 | 750 | 750 |
| Other improved land | do | 85 | 85 | 85 | 85 | 85 | 85 | 85 |
| Woodland and waste | do | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| Sharecropper crops: | | | | | | | | |
| Cotton | do | 504 | 484 | 0 | 0 | 0 | 214 | 208 |
| Corn and interplanted soybeans | do | 70 | 61 | 46 | 51 | 46 | 56 | 54 |
| Gardens (rent free) | do | 19 | 9 | 0 | 0 | 0 | 14 | 13 |
| Wage crops: | | | | | | | | |
| Cotton | do | 0 | 0 | 600 | 700 | 470 | 429 | 416 |
| Corn and interplanted soybeans | do | 0 | 67 | 0 | 110 | 1 | 0 | 22 |
| Alfalfa hay | do | 45 | 47 | 45 | 45 | 8 | 18 | 18 |
| Soybean hay | do | 47 | 47 | 45 | 45 | 8 | 18 | 18 |
| *Winter legumes turned under* | do | 188 | 68 | 203 | 91 | 225 | 274 | 208 |
| Wage-labor gardens (rent free) | do | 1 | 1 | 21 | 16 | 12 | 1 | 1 |
| Labor organization: | | | | | | | | |
| Sharecropper families | number | 28 | 32 | 0 | 0 | 0 | 28 | 27 |
| Wage-labor families | do | 0 | 0 | 20 | 27 | 25 | 0 | 0 |
| Blacksmith | do | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Hostler | do | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| *Hire labor on wage crops:*[1] | | | | | | | | |
| Cotton, excluding picking | days | 0 | 0 | 3,752 | 3,167 | 1,769 | 2,021 | 1,959 |
| Corn and interplanted soybeans | do | 0 | 222 | 0 | 375 | 0 | 0 | 75 |
| Alfalfa | do | 179 | 179 | 179 | 179 | 28 | 64 | 64 |
| Soybean hay | do | 90 | 90 | 90 | 90 | 16 | 36 | 36 |
| Winter legumes turned under | do | 128 | 46 | 138 | 64 | 74 | 71 | 69 |
| Contract labor on wage crops: | | | | | | | | |
| Pick cotton | bales | 0 | 0 | 426 | 474 | 153 | 360 | 291 |
| Haul cotton pickers[2] | dollars | 0 | 0 | 312 | 378 | 96 | 218 | 211 |
| Miscellaneous day labor | days | 228 | 228 | 228 | 228 | 164 | 180 | 180 |

[1] The major characteristics of each system are: System IA—sharecroppers, 1-row and 1-row mule-drawn machinery, feed grain for livestock purchased. System IB—similar to system IA, except that all of feed for livestock is produced. System IIA—wage labor, 1-row mule-drawn machinery, feed grain for work stock purchased. System IIB—similar to system IIA, except that all of feed grain for work stock produced. System III—wage labor, tractor power. System IVA—combination wage labor and sharecroppers, mule and tractor power, all feed grain for work stock purchased. System IVB—similar to IVA, except that all of feed grain for work stock produced. For fuller description of each system, see section beginning on p. 79.

[1] Based on usual amounts of labor used per acre in producing different crops. The tables in which data are shown for individual crops are: Table 27, cotton; table 28, corn and interplanted soybeans; table 31, soybean hay; table 32, alfalfa hay, and table 34, winter legumes. Wage cotton is picked on a contract basis.

Approximately 1,562 pounds of seed cotton per bale of 500 pounds lint, gross weight.

[2] 80 cents per 100 pounds of seed cotton picked by the labor hauled.

Each of the budgeted systems contains 950 acres, of which 750 acres are cropland (table 36). Holdings of this size approximate the one-unit plantations commonly found in the area, and are close to the average size of the plantations included in this study. A plantation of this size ordinarily is operated by the owner or a resident manager with the help of an overseer. Because of its importance in the agriculture of the area, cotton is the only commercial enterprise indicated in the budgets, with variations in the cotton acreage as between systems dependent principally on whether feed grains are purchased or

produced. In all systems, provision is made for the production of all the hay fed to work stock. Rent-free garden space is provided for the resident wage laborers and sharecroppers, and each family is allowed to produce 2 acres of corn on a share basis.

In systems IA and IB, all of the cotton acreage is operated with sharecroppers. The acreage in cotton per sharecropper family is limited to the acreage that ordinarily can be hoed and picked without hiring additional labor. Mules are the only source of motive power used in production, and half-row and one-row cultivating equipment is used. All of the hay fed to work stock is produced with wage labor. The only difference between the two systems is that most of the grain fed to work stock in system IA is purchased, whereas all the grain fed in system IB is produced on the plantation. A small acreage in corn is operated with sharecroppers on both systems, but the plantation operator's shares obtained are relatively small compared with the quantity purchased in system IA and the quantity produced with wage labor in system IB (table 38).

Although both systems were common in the area, system IA was the most prevalent before the adoption of the general-purpose tractor and the initiation of the cotton-acreage-adjustment programs of the Agricultural Adjustment Administration.

Systems IIA and IIB are operated almost entirely with wage labor. A sufficient number of resident wage laborers are maintained to provide all the labor needed prior to cotton harvest. Mules are the only source of motive power used in production. One-row cultivating equipment is used. All of the hay fed to work stock is grown on the plantation. A small acreage in corn in both systems is produced on a share basis by resident wage laborers, but the plantation operator's shares are relatively small as compared with the amounts used. The only difference between the two systems is that most of the grain fed to work stock in system IIA is purchased, whereas all of the grain fed in system IIB is produced on the plantation.

The use of wage labor with animal power for the production of cotton has not been common in the area. A continued reduction in cotton acreage in conjunction with restrictions on the commercial disposal of commodities produced on the acreage taken out of cotton may result, however, in an increase in systems such as are represented by IIB.

In system III, the entire cotton acreage is operated with wage labor. A sufficient number of resident wage laborers are maintained to perform, under normal weather conditions, all production operations that come before cotton harvesting. Transient labor is used to supplement the resident labor during the cotton-harvesting season. Tractors constitute the predominant source of motive power, and four-row tractor equipment is used in producing wage crops. A few mules are maintained primarily to haul wood for labor, to haul cotton to the gin, and to work a small acreage in corn operated on a share basis by resident wage laborers. The plantation operator's shares of the corn produced usually is sufficient to supply the grain needed for the plantation work stock. In addition, a small acreage in hay for work-stock consumption is grown with wage labor.

Relatively few plantations are so completely mechanized as this system because of the risks of seasonal labor being unavailable in

adequate numbers to take care of the heavy hand-labor requirements of cotton picking when timely. Assuming no restriction in cotton acreage and production, the perfection and widespread adoption of mechanical cotton pickers would undoubtedly result in a large increase in the number of plantations following this system.

TABLE 37.—*Buildings, power, and equipment in various plantation systems*

| Item | Data for plantation systems | | | | | | |
|---|---|---|---|---|---|---|---|
| | IA | IB | IIA | IIB | III | IVA | IVB |
| Buildings: | | | | | | | |
| Headquarters | Number | Number | Number | Number | Number | Number | Number |
| Barn | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Shed | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Other buildings | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cropper and labor houses | 30 | 31 | 32 | 29 | 24 | 30 | 30 |
| Cotton houses | 28 | 32 | 30 | 27 | 24 | 28 | 27 |
| Power: | | | | | | | |
| Mules | 38 | 38 | 38 | 38 | 6 | 14 | 14 |
| Saddle horses | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Tractors | 0 | 0 | 0 | 0 | 1 | 3 | 3 |
| Equipment: | | | | | | | |
| Mule-drawn: | | | | | | | |
| 4-mule middlebusters | 1 | 0 | 1 | 0 | 1 | 2 | 2 |
| Turning plows | 6 | 6 | 6 | 6 | 2 | 3 | 3 |
| Section harrows | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| 1-row planter | 36 | 36 | 1 | 1 | 1 | 1 | 1 |
| 2-row walking cultivator | 29 | 29 | 29 | 29 | 5 | 7 | 7 |
| 4-row cultivators | 12 | 12 | 6 | 6 | 2 | 3 | 3 |
| 2-row planters | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 4-mule disk | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Mower | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Dump rake | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Side-delivery rake | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 1-row stalk cutter | 1 | 1 | 1 | 1 | 0 | 2 | 2 |
| Poison machines | 2 | 2 | 2 | 2 | 0 | 0 | 0 |
| Wagon | 6 | 6 | 1 | 1 | 3 | 1 | 1 |
| Grain drill | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Dusting machine | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Tractor-drawn: | | | | | | | |
| Middlebuster | 1 | 0 | 0 | 0 | 1 | 3 | 3 |
| Disks | 0 | 0 | 0 | 0 | 3 | 2 | 2 |
| Poison machine | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 4-row planter | 0 | 0 | 0 | 0 | 2 | 1 | 1 |
| 4-row cultivators | 0 | 0 | 0 | 0 | 1 | 3 | 3 |
| Drags | 0 | 0 | 0 | 0 | 2 | 1 | 1 |

For the major characteristics of each system, see footnote 1, Table 36. A more complete description of each system is contained in the section beginning on p. 79.

Systems IVA and IVB are intermediate between systems IA and IB, and system III. In systems IVA and IVB, the acreage of cotton per sharecropper family is considerably less than that normally operated, and the excess sharecropper labor, supplemented as needed with outside seasonal labor, is used on wage crops. Thus the small acreage in share crops per family serves to keep a nucleus of labor on the plantation for use on wage crops. In the budget, the sharecropper nucleus provided is sufficiently large to perform all of the labor needed on sharecrops and wage crops except harvesting. Four-row tractor-drawn equipment is used on wage crops, and one-row mule-drawn cultivating equipment is used on cropper crops.

There is indication that systems such as IVA and IVB are becoming increasingly common in the area. Such systems represent a transitional step from share operations that ultimately may materialize in full wage operations and the decreased use of labor in production if the cotton hoeing and picking problems, and particularly the latter, can be economically solved.

The only distinction between systems IVA and IVB is that most of the grain fed work stock in the former is purchased, while in the latter system the grain is produced. A relatively small acreage in corn is grown on a share basis, and sufficient hay for work stock is produced in both systems.

TABLE 38. *Production, purchases, and disposal of crops on various plantation systems*

| Item | Unit | Data for plantation system[1] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | IA | IB | IIA | IIB | III | IVA | IVB |
| Cotton lint: | | | | | | | | |
| Production[2] | Bales | 297.4 | 369.4 | 126.3 | 453.2 | 473.2 | 54.2 | 504.0 |
| Purchases from cropper | do | 297.4 | 369.4 | 0 | 0 | 0 | 54.2 | 72.8 |
| Sales | do | 301.8 | 338.8 | 126.3 | 344.2 | 473.2 | 150.4 | 436.8 |
| Cottonseed: | | | | | | | | |
| Production[2] | tons | 104.0 | 130.8 | 226.7 | 188.2 | 251.7 | 106.4 | 193.4 |
| Purchases from cropper | do | 104.0 | 130.8 | 0 | 0 | 0 | 29.8 | 38.7 |
| Sales | do | 105.9 | 105.5 | 208.2 | 173.0 | 251.2 | 209.9 | 213.4 |
| Plantation use | do | 16.9 | 14.5 | 18.5 | 15.2 | 20.3 | 19.3 | 18.7 |
| Corn: | | | | | | | | |
| Production[3] | bu. bush. | 740 | 2,540 | 100 | 2,540 | 100 | 500 | 980 |
| Purchases | do | 1,775 | 0 | 2,535 | 0 | 0 | 105 | 0 |
| Plantation use | do | 2,535 | 2,540 | 2,635 | 2,540 | 100 | 597 | 980 |
| Alfalfa hay: | | | | | | | | |
| Production | Tons | 90 | 90 | 90 | 90 | 76 | 36 | 36 |
| Plantation use | do | 90 | 90 | 90 | 90 | 76 | 36 | 36 |
| Soybean hay: | | | | | | | | |
| Production | do | 45 | 45 | 45 | 45 | 8 | 18 | 18 |
| Plantation use | do | 45 | 45 | 45 | 45 | 8 | 18 | 18 |

[1] For the major characteristics of each system, see footnote 1, table 36. A more complete description of each system is contained in the section beginning on p. 79.
[2] Wage crops plus plantation operator's share of cropper crops.
[3] 56 pounds, gross weight.

## FINANCIAL SUMMARY FOR BUDGETED SYSTEMS

The net plantation income represents the returns to the operator for his management and for the use of his plantation, as defined on page 6 and further explained in connection with table 19. On the basis of the production, price, and expense assumptions used in the budgeted computations, the largest net plantation income is obtainable from system III, in which a large proportion of the cropland is in cotton operated with tractors and wage labor (table 39). The next highest incomes are indicated for systems IVA and IVB, in which wage operations and tractor power also predominate, but in which a relatively small acreage per labor family is operated on a share basis so as to insure a resident supply of labor for use on wage crops before harvest. The lowest net plantation incomes for the systems budgeted are indicated for systems IA and IB, in which all the cotton is produced with sharecroppers and mule power.

Assuming that all other conditions remained the same, the net plantation incomes from systems IA and IB would be further lowered if share tenants were used instead of sharecroppers. An adjustment of the budgets to note the effect of a change from sharecroppers to share tenants indicates that the net plantation incomes in systems IA and IB would be lowered by $891 and $868, respectively.

The use of wage labor and mules in systems IIA and IIB results in higher incomes than in systems IA and IB, but in materially lower returns than obtained in system III or systems IVA and IVB.

TABLE 39.—*Investment, receipts, expenses, and net income in various plantation systems*

| Item | Data for plantation system [1]— | | | | | | |
|---|---|---|---|---|---|---|---|
| | IA | IB | IIA | IIB | III | IVA | IVB |
| Plantation investment: | | | | | | | |
| Land | $43,475 | $43,475 | $43,475 | $43,475 | $43,475 | $43,475 | $43,475 |
| Buildings and improvements | 9,925 | 8,650 | 6,100 | 5,462 | 5,837 | 7,300 | 7,087 |
| Machinery and equipment | 1,508 | 1,508 | 1,454 | 1,454 | 4,213 | 3,439 | 3,439 |
| Work stock | 3,412 | 3,412 | 3,412 | 3,412 | 612 | 1,312 | 1,312 |
| Total | 58,320 | 57,045 | 54,441 | 53,803 | 54,137 | 55,526 | 55,313 |
| Gross plantation income: [2] | | | | | | | |
| Cotton lint | 23,688 | 20,328 | 25,578 | 21,262 | 28,392 | 27,606 | 26,208 |
| Cottonseed | 4,822 | 4,138 | 5,207 | 4,326 | 5,780 | 5,498 | 5,335 |
| Supervision, commissions, and interest | 846 | 726 | 0 | 0 | 0 | 321 | 312 |
| Total | 29,356 | 25,192 | 30,785 | 25,578 | 34,172 | 32,825 | 31,856 |
| Gross plantation expenses: [3] | | | | | | | |
| Cash expenses: | | | | | | | |
| Sharecroppers' cotton lint and seed purchased | 11,467 | 12,415 | 0 | 0 | 0 | 5,480 | 5,335 |
| Wage labor hired | 605 | 845 | 10,705 | 9,281 | 10,503 | 6,844 | 6,723 |
| Feed purchased | 1,420 | 0 | 2,135 | 0 | 0 | 332 | 0 |
| Hostler | 285 | 285 | 285 | 285 | 45 | 105 | 105 |
| Work stock miscellaneous | 57 | 57 | 57 | 57 | 9 | 21 | 21 |
| Repairs, mule-drawn equipment | 456 | 456 | 456 | 456 | 72 | 168 | 168 |
| Fuel, lubricants, and repairs, tractor and tractor-drawn equipment | 0 | 0 | 0 | 0 | 2,072 | 1,378 | 1,337 |
| Automobile [4] | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Seed, fertilizer, poison, and inoculation | 306 | 465 | 1,036 | 640 | 1,004 | 793 | 723 |
| Miscellaneous supplies [5] | 55 | 80 | 210 | 212 | 208 | 150 | 153 |
| Ginning | 1,221 | 1,048 | 2,637 | 2,191 | 2,927 | 2,323 | 2,252 |
| Repairs, buildings and improvements | 195 | 432 | 306 | 275 | 327 | 390 | 370 |
| Insurance on buildings | 140 | 125 | 104 | 98 | 108 | 120 | 118 |
| Taxes | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 |
| Interest on operating expenses [6] | 214 | 185 | 273 | 193 | 225 | 222 | 205 |
| Miscellaneous | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Depreciation: | | | | | | | |
| Work stock | 858 | 858 | 858 | 858 | 154 | 330 | 330 |
| Mule-drawn equipment | 342 | 342 | 342 | 342 | 54 | 126 | 126 |
| Tractors | 0 | 0 | 0 | 0 | 660 | 495 | 495 |
| Tractor-drawn equipment | 0 | 0 | 0 | 0 | 220 | 165 | 165 |
| Buildings and improvements | 685 | 598 | 424 | 381 | 453 | 540 | 525 |
| Total | 23,036 | 20,291 | 21,928 | 17,369 | 21,141 | 22,049 | 21,280 |
| Net plantation income: | | | | | | | |
| Per plantation | 5,420 | 4,898 | 8,857 | 8,209 | 13,031 | 10,736 | 10,595 |
| Per crop acre | 7.23 | 6.53 | 11.81 | 10.95 | 17.37 | 14.31 | 14.13 |

[1] For the major characteristics of each system, see footnote 1, table 36. A more complete description of each system is contained in the section beginning on p. 79.

[2] Plantation operator's share of income except for cotton lint and seed, which include also all of the share croppers' shares, purchased by the operator as shown in table 38.

[3] Plantation operator's share of expenses, plus the value of the sharecroppers' shares of cotton lint and seed purchased.

[4] Automobile expense chargeable to plantation operation.

[5] Picking sacks, hoes, files, etc.

[6] Interest at 6 percent per annum on funds, borrowed or owned, used in production operations and in making credit advances to tenants.

In addition to the type of labor used, it is significant that in none of the systems in which corn is produced for work-stock needs are the earnings so high as in comparable systems in which concentrates for work stock are purchased and the cropland is devoted more largely to cotton production. The reasons for the differences in earnings in the systems budgeted may be indicated by a brief examination of some of the factors that influence incomes and expenses as between systems.

### INVESTMENT

The plantation investment enters into the computation of plantation net income only through charges made for depreciation and repairs. It is significant, however, that the largest investment per plantation is in systems IA and IB, principally because of the large number of tenant houses and buildings needed. There is not much difference as between systems in the investment in power and equipment.

The numbers of buildings, mules, tractors, and various types of equipment in each system are estimated on the basis of conditions found on the plantations studied during the 5-year period 1932–36. In arriving at investment values, it was endeavored to make the different systems fully comparable. Cropland and other improved land was valued at $50 per acre, and unimproved land at $15 per acre. Buildings power, and equipment were valued at approximately one-half of their present replacement costs as determined from estimates obtained from plantation operators and implement dealers in the area. Work stock were valued at $87.50 per head, or approximately one-half the current average price of a 5-year-old work animal weighing from 1,000 to 1,100 pounds.

### RECEIPTS AND EXPENSES

The total acreage in crops, crop yields, and prices paid and received are held constant in all the plantation systems budgeted; hence, differences in net plantation incomes among the various systems are determined by differences in organization and operation.

With the price relationships and normal yields and production requirements used, the largest gross receipts are obtained in the systems that had the largest proportions of cropland in cotton. Thus the production of feed would be relatively profitable only if such a plan resulted in a reduction in operating expenses sufficiently great to offset lower cash receipts. Under the conditions assumed in the budgets, this is not the case. The lowest expenses are in systems IB and IIB, but these are more than offset by the low receipts obtained as compared with the other systems budgeted.

The level of plantation expenses is also influenced to an important degree by the types of power and labor used. Sharecroppers receive one-half of the crops they produce in payment for their labor and for the materials, ginning fees, and other items contributed by them. On the basis of the data used in the budget, the cost of sharecropper labor amounts to more than the equivalent amount of labor hired on a wage basis. This is indicated by the higher expenses in system IA than in IIA, and in system IB as compared with IIB. Systems IA and IB, it will be remembered, are operated with sharecroppers, whereas systems IIA and IIB are operated with wage labor. The greater economy of using mechanical power also is indicated by the relatively lower expenses in system III than in system IIA. The former system is operated primarily with tractor power, whereas the latter is operated entirely with mules.

### ADAPTABILITY OF BUDGETED SYSTEMS

On the basis of the assumptions used in the budget analysis in the preceding section, it may be concluded that plantation operators would find it most profitable to devote the largest proportion of their

cropland to cotton, and to use wage labor and tractor power. As between sharecroppers and share tenants, higher net plantation incomes would be realized from the use of the former. With the yields and prices used in the analysis, the comparative advantage of cotton over feed crops is relatively so great that plantation operators using work stock would benefit more by purchasing than by producing feed concentrates.

The assumptions used in the analysis are well representative of conditions that have prevailed on plantations generally in the area. The results indicated serve to explain in large part the high specialization in cotton production in the area before the initiation of adjustment programs, and the changes that have been occurring in the use of labor and power.[18] These assumptions may change with time, however, and may differ as between individual plantations during the same year, because of the frequent changes in prices and in production conditions.

In addition to the estimated financial net returns for a given period, there are other factors affecting the adaptability of the systems analyzed that should be given full consideration. Reference already has been made to the individual plantation operator's aptitude and personal preferences. Other important factors are physical adaptability; the availability of labor, as well as the status of employment desired by labor; the fertility problem in relation to the cropping system; price changes, both general and in relation to each other; and the influence of agricultural adjustment programs on the organization of the cropland. These factors are so important that brief consideration will be given to each so as to indicate how its influence may affect production plans.

### PHYSICAL ADAPTABILITY

Although physical conditions generally are fairly uniform throughout the area, the situation on individual plantations may affect significantly the type of power that may be used and the proportions of crops that may be grown most economically. The use of tractor power and of large machinery may be restricted on plantations with large acreages of cropland recently cleared and still in stumps. Individual plantations also may contain land on which cotton yields are relatively low because of slow drainage or other physical conditions, but upon which satisfactory yields of soybeans, sagrain, or other feed crops may economically be grown.

In both of these situations, the plantation operator obviously would not be able economically to adopt a production program such as described for system III.

### FERTILITY

A successful long-time production plan necessarily must make provision for the maintenance of soil productivity. On land not subject to floods, cropping systems based primarily on the production of cotton and corn usually result in nitrogen and humus deficiencies unless offset by the turning under of an adequate supply of legumes. Nitrogen can be supplied by means of legumes or by the addition of chemical fertilizers, depending on the labor, power, and other conditions on individual plantations, and on the relative costs of legume

[18] Changes in the use of labor and power are discussed previously beginning on pp. 52 and 26, respectively.

seed and of chemical fertilizers. The use of legumes, however, is particularly advantageous on soils that are deficient in both nitrogen and humus.

In the budgeted systems, it was assumed that a crop of legumes turned under was equivalent to an addition of 30 pounds of nitrogen each year for 2 years and, together with other crop residues, would provide adequately for the maintenance of organic material. The acreage in winter legumes to be turned under in preparation for cotton was restricted to one-third of the cotton acreage so as not to endanger the timeliness of land preparation and of cotton planting.

In the plantation systems highly specialized in cotton production, therefore, it was necessary to provide for the use of chemical fertilizers in quantities approximately equivalent to the fertility elements supplied by legumes in the other systems. In systems IIA, III, IVA, and IVB, in which from 81 to 90 percent of the cropland is in cotton, expenses are shown for nitrogenous fertilizers in quantities of 14,000, 19,200, 13,600, and 6,600 pounds, respectively. On individual plantations with deficiencies both in organic material and in nitrogen, the operator may not find it economical to specialize so highly in cotton production as in system III.

### LABOR

An important consideration affecting the operator's organization and operation plans is the great amount of labor needed to meet the heavy demands of the cotton crop during the hoeing and picking seasons. Under prevailing price and production conditions in the area, the risk of an adequate supply of labor being unavailable during these seasons is the most important factor that limits a widespread use of wage labor and large-scale equipment. The perfection of economical mechanical cotton harvesters would remove this obstacle in large measure, and would further enhance the advantages of production plans such as system III as compared with the other systems for which budgets are shown. Under conditions of scarce or uncertain supplies of labor, however, the maintenance on plantations of a labor force adequate to meet all normal demands usually involves the least risk.

The operator's choice of a particular plantation system may also be conditioned by the laborers' preference for share or for wage employment, as discussed on page 52.

### YIELDS AND PRICES

Yields significantly different from those shown in table 26 or changes in prices may affect materially the relative returns obtained from the different systems for which budgets are shown. The influence of varying cotton yields and of varying prices of cotton and cottonseed, labor, and tractor fuel and oil on the returns from systems IB and III, when all other elements are held constant, is indicated in table 40.

These two systems were selected for the illustration because they represent extremes in plantation organization and operation that are fairly common in the area. In system IB, it will be remembered, all of the cotton is produced with share labor, animal power is used exclusively, and all of the work-stock feed is produced on the plantation. In system III, on the other hand, wage labor only is used in

producing cotton, most of the cropland is in cotton, and tractors are the chief source of power.

TABLE 40.—*Comparison of net plantation incomes from system IB and system III, with varying yields and prices of cotton and cottonseed, varying labor rates, and varying prices of tractor fuel and oil, assuming all other elements constant* [1]

| Price of cotton lint and cottonseed | Cotton lint, yield per acre | Plantation system No. | Net plantation income or deficit under conditions shown | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Labor, 50 cents per day and per cwt. cotton picked | | | Labor, $1 per day and per cwt. cotton picked | | | Labor, $1.50 per day and per cwt. cotton picked | | |
| | | | Price of gasoline per gallon and oil per quart | | | Price of gasoline per gallon and oil per quart | | | Price of gasoline per gallon and oil per quart | | |
| | | | 8 cents | 13 cents | 18 cents | 8 cents | 13 cents | 18 cents | 8 cents | 13 cents | 18 cents |
| | *Pounds* | | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Lint, 6 cents per pound; seed, $15 per ton | 250 | IB | −2,054 | −2,054 | −2,054 | −2,477 | −2,477 | −2,477 | −2,900 | −2,900 | −2,900 |
| | | III | −1,365 | −1,905 | −2,445 | −5,751 | −6,291 | −6,831 | −10,137 | −10,677 | −11,217 |
| | 350 | IB | −516 | −516 | −516 | −939 | −939 | −939 | −1,362 | −1,362 | −1,362 |
| | | III | 1,662 | 1,122 | 582 | −3,778 | −4,318 | −4,858 | −9,218 | −9,758 | −10,298 |
| | 450 | IB | 1,022 | 1,022 | 1,022 | 599 | 599 | 599 | 176 | 176 | 176 |
| | | III | 4,689 | 4,149 | 3,609 | −1,805 | −2,345 | −2,885 | −8,299 | −8,839 | −9,379 |
| Lint, 12 cents per pound; seed, $25 per ton | 250 | IB | 2,074 | 2,074 | 2,074 | 1,651 | 1,651 | 1,651 | 1,228 | 1,228 | 1,228 |
| | | III | 10,387 | 9,827 | 9,287 | 5,983 | 5,443 | 4,903 | 1,597 | 1,057 | 517 |
| | 350 | IB | 5,321 | 5,321 | 5,321 | 4,898 | 4,898 | 4,898 | 4,475 | 4,475 | 4,475 |
| | | III | 18,169 | 17,629 | 17,089 | 12,730 | 12,190 | 11,650 | 7,291 | 6,751 | 6,211 |
| | 450 | IB | 8,568 | 8,568 | 8,568 | 8,145 | 8,145 | 8,145 | 7,722 | 7,722 | 7,722 |
| | | III | 25,951 | 25,431 | 24,891 | 19,477 | 18,937 | 18,397 | 12,983 | 12,443 | 11,903 |
| Lint, 18 cents per pound; seed, $35 per ton | 250 | IB | 6,202 | 6,202 | 6,202 | 5,779 | 5,779 | 5,779 | 5,356 | 5,356 | 5,356 |
| | | III | 22,099 | 21,559 | 21,019 | 17,717 | 17,177 | 16,637 | 13,335 | 12,795 | 12,255 |
| | 350 | IB | 11,158 | 11,158 | 11,158 | 10,735 | 10,735 | 10,735 | 10,312 | 10,312 | 10,312 |
| | | III | 34,676 | 34,136 | 33,596 | 29,238 | 28,698 | 28,158 | 23,800 | 23,260 | 22,720 |
| | 450 | IB | 16,114 | 16,114 | 16,114 | 15,691 | 15,691 | 15,691 | 15,268 | 15,268 | 15,268 |
| | | III | 47,253 | 46,713 | 46,173 | 40,759 | 40,219 | 39,679 | 34,265 | 33,725 | 33,185 |

[1] For description of systems IB and III, see p. 81. The upper figure in each situation in the body of the table is the computed net plantation income from system IB, while the lower figure is the computed net plantation income from system III. As shown in the lower left-hand situation, for example, the net plantation incomes from systems IB and III would amount to $16,114 and $47,253, respectively, from the combination of yields, prices, and wage rates indicated for that particular situation.

The influence of varying yields and prices is reflected in differences in the net plantation incomes shown for the two systems in the body of table 40. The upper figure in each situation is the computed net plantation income from system IB, and the lower figure in each situation represents the computed net plantation income from system III.

For example, the figures shown in the first upper left-hand situation of the table represent the net plantation incomes from the two systems resulting from a combination of average yields of 250 pounds of lint cotton selling at 6 cents per pound of lint and $15 per ton of cottonseed, labor rates of 50 cents per day and of 50 cents per 100 pounds of seed cotton picked, and tractor fuel and lubricants at 8 cents per gallon of gasoline and 8 cents per quart of oil. Under these conditions, the returns fail to meet operating expenses and depreciation by $2,054 in system IB and by $1,365 in system III. Likewise, in the first upper right-hand block of the table, cotton yields and prices remain

unchanged, but it is assumed that labor rates amount to $1.50 per day and $1.50 per 100 pounds of seed cotton picked, and that prices of tractor fuel and lubricants are 18 cents per gallon of gasoline and 18 cents per quart of oil. Under these conditions, money losses result again in both systems, but are much larger in system III than in system IB. The figures in the other situations in the table may be interpreted in the same way for the varying conditions of yields and prices shown.

Although the data are primarily illustrative, they do indicate rather definitely the yield and price conditions under which particular types of labor or power may be used more advantageously than others. As between the two systems used in the table, plantation organizations such as represented by system IB returned the largest incomes or the smallest losses in situations of low cotton yields or prices and of relatively high wage rates and fuel prices. On the other hand, plantation organizations such as represented by system III returned much higher incomes, relatively, in situations of high cotton yields or prices and of relatively low wage rates and fuel prices.

Eliminating consideration of the possibility of losses in furnishing credit advances to tenants, a plantation system based on the use of share labor and work stock and on the production of feed for work stock presents the least risk of large money losses. Another advantage of such a system is the availability of an adequate supply of resident labor and the elimination of the risk of not being able to obtain sufficient labor for the timely performance of production operations. Under favorable price and production conditions, on the other hand, the income opportunities in such a system are much lower than in a plan of operation such as represented by system III.

### AGRICULTURAL ADJUSTMENT PROGRAMS

As indicated in a preceding section, the programs of the Agricultural Adjustment Administration were an important factor influencing plantation organization and earnings during 4 of the 5 years of this study. It is not within the scope of this bulletin to evaluate those programs in terms of their effects on plantation organization and earnings. It is obvious, however, that the relative economic advantages of the various plantation systems for which budgets are shown would be influenced by participation in agricultural adjustment programs that affect production organizations. This may be illustrated by assuming a uniform reduction of 40 percent in the cotton acreage shown for the various systems in table 36, and that the use of the land taken out of cotton be limited to soil-building purposes or to the production of food and feed for plantation use. Systems IB, IIB, and IVB would be even further disadvantaged, compared with the other systems budgeted, in that all the work-stock feed needed is already being produced on these systems, and adequate provision is made for the conservation of soil productivity by the turning under of legumes. On the other systems, the land taken out of cotton could be used effectively in increasing the acreage in soil-building crops and in increasing the acreage in feed crops to the amount needed on the plantation.

Continued drastic reduction in cotton acreage and the availability of land otherwise idle for the production of work-stock feed probably

would increase the economy of mule power over tractors and tend to arrest the trend toward the use of mechanical power in the area.

Even under conditions of curtailed cotton acreage, however, the relative economic advantages of various plantation systems would have to be determined on the basis of prospective price conditions during a given period, and of the benefits likely to be derived from participating in the adjustment program.

### OTHER CONSIDERATIONS IN BUDGETING PLANTATION SYSTEMS

It is emphasized that the individual plantation operator should use data in budgeting that are directly applicable to his plantation. The data presented in this bulletin are well representative of conditions on plantations in the area generally, but it is obvious that differences in soils, labor, management, and other conditions as between plantations necessitate that these data be modified when budgeting alternatives on individual plantations. Likewise, the prices used in formulating income and expense estimates should be in line with probable prices that are likely to prevail during the production period to which the budget applies.

For greatest accuracy, plantation budgets should be based upon records and accounts that indicate adequately the production situation and possibilities on the plantation for which a management plan is developed. The accounts kept on plantations in the area usually are limited to financial receipts and expenses, and hence cannot be used effectively in budgeting. Financial accounts are useful measures of profits or losses in the past, but obviously are of very limited use in estimating future income expectancies. Thus to be most effective, plantation financial accounts need to be supplemented with records on yields, on quantities of labor, power, materials, and other items used in production, and on the periods when these items are needed.

Having established long-time averages or usual relationships of yields and of factors used in production that are applicable to his particular plantation, such as was done in the preceding section for plantations in the area generally, the operator is in a position to budget his alternative production opportunities to determine their relative economic merits in terms of probable prices that are likely to prevail.

It is usually desirable to plan a production system for a period of years rather than to make radical shifts from year to year. Yet a situation may arise in individual years that may necessitate some adjustments in the long-time plan. Unfavorable weather conditions may delay field operations and force the hiring of more labor than originally planned. A widespread drought in other parts of the country may result in such high feed prices relative to prospective cotton prices that it may be considered advantageous to produce rather than to buy feed. The destruction of some of the cotton acreage by flood or other conditions may be partly offset by the production of late feed crops. Other situations may arise that may suggest the desirability of modifying the long-time plan to conform to conditions during individual years.

Need for occasional modification does not minimize the importance of budgeting production plans in advance. On the contrary, the operator who has thought through his production program in advance

is usually better prepared to meet emergencies when they arise and to make necessary adjustments from which gains may be realized or losses avoided.

Another factor in plantation organization and operation during recent years has been the general participation in adjustment programs sponsored by the Agricultural Adjustment Administration. Agricultural adjustment programs that affect farm organizations and production in a region or in the Nation do not lessen the need for the individual operator to plan his business operations in a systematic way, as represented by budgets. Group action in the form of general participation in adjustment programs, such as sponsored by the Agricultural Adjustment Administration during recent years, has the same general objective as individual planning. That objective, as already stated, is for individual producers to obtain the highest net returns from their farm business consistent with the conservation of their production resources.

The primary difference between individual planning and group planning is that the former is done on the basis of prospective prices over which the individual has no control, whereas group planning may seek to influence prices by controlling the production or sale of particular commodities. In either case, the need for evaluating various alternative production courses is evident.

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