

6-1-1944

## Farm Organization and Adjustment Problems in the Shortleaf Pine Area of Mississippi

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### Recommended Citation

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# Farm Organization and Adjustment Problems

IN THE

## Shortleaf Pine Area

OF MISSISSIPPI

SIZE AND TYPE OF FARM		DOLLARS NET CASH FARM INCOME		
		500	1000	1500
SMALL COTTON	BEFORE REORG.	170		
	AFTER REORG.	664		
MEDIUM COTTON- LIVESTOCK	BEFORE REORG.	504		
	AFTER REORG.	1233		
MEDIUM COTTON- DAIRY	BEFORE REORG.	634		
	AFTER REORG.	1276		

Net cash farm income before and after reorganizing three representative farms in the Shortleaf Pine type-of-farming Area (assumes 1937-41 average prices)

In Cooperation With  
THE BUREAU OF AGRICULTURAL ECONOMICS  
U. S. DEPARTMENT OF AGRICULTURE

MISSISSIPPI STATE COLLEGE  
AGRICULTURAL EXPERIMENT STATION  
CLARENCE DORMAN, Director

STATE COLLEGE

MISSISSIPPI

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## Acknowledgments

The authors wish to express appreciation to all those who contributed to the development of this report. Special mention should be made of the field work done by Paul S. McComas, formerly with the Farm Management and Cost Division of the Bureau of Agricultural Economics, and W. G. O'Leary, formerly with the Mississippi Experiment Station, both of whom are now serving with the United States military forces.



# FARM ORGANIZATION AND ADJUSTMENT PROBLEMS IN THE SHORLEAF PINE AREA, MISSISSIPPI

By ELBRIDGE A. TUCKER, FRANK J. WELCH  
and JAMES C. DOWNING<sup>1</sup>

The need for agricultural adjustments in the Shortleaf Pine Area stems largely from the fact that returns to farm families are much too low. Relative returns after the war may be much lower unless adjustments are made in the size of farms, number of farm workers, crop and livestock systems, and production practices. Excessive soil erosion and the unfavorable outlook for cotton emphasize the need for wide-spread adjustments.

The purpose of this study is to provide information about farming in the Shortleaf Pine Area that will aid policy makers, agricultural technicians, and farmers in their efforts to improve the status of farm families residing in the Area. Information concerning farm income and the conservation of resources will be stressed. Specific objectives include the following:

- (1) To provide a general description of the area and its resources.
- (2) To describe the kinds of farms in the Area and show their distribution according to important size and type groups. Farm problems can be effectively attacked through studying adjustments needed on farms of different sizes and types.
- (3) To indicate the kind and extent of changes that should be made in the organization of individual farms representing important size and type groups.
- (4) To indicate the extent to which farm incomes could be raised through farm reorganization as in (3) above, and through the adoption of recommended production practices.
- (5) To indicate the nature, direction, and extent of desirable post-war agricultural adjustments for the Area as a whole.
- (6) To discuss ways in which obstacles to agricultural adjustment could be overcome.

## Collection and Preparation of Data

Data concerning land use and livestock numbers were tabulated from a 20-percent sample of the 1941 AAA worksheets from four sample counties of the Area—Leake, Calhoun, Union, and Winston—as an aid in describing the agriculture of the Shortleaf Pine Area and for use as a basis for selecting representative farms from which more detailed information concerning individual farm businesses might be obtained. The AAA records were classified into groups of farms with similar resources and organization. Detailed farm organization data were obtained by the survey method from 208 farms selected at random from the major size-type groups of farms. Farms with organizations representative of numerically important size-type groups were studied in detail as an aid in determining adjustments that individual farmers might be able to make.

Data concerning possible crop yield and livestock production rate increases were obtained from specialists of the Mississippi Experiment Station. Census data were also used as an aid in describing the Area.

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## GENERAL CHARACTERISTICS OF THE SHORTLEAF PINE AREA

The Shortleaf Pine Area consists of 21 counties, approximately 7-6 million acres, located in the central and north-central part of the State, extending from the Tennessee line on the north to the Alabama line on the east.

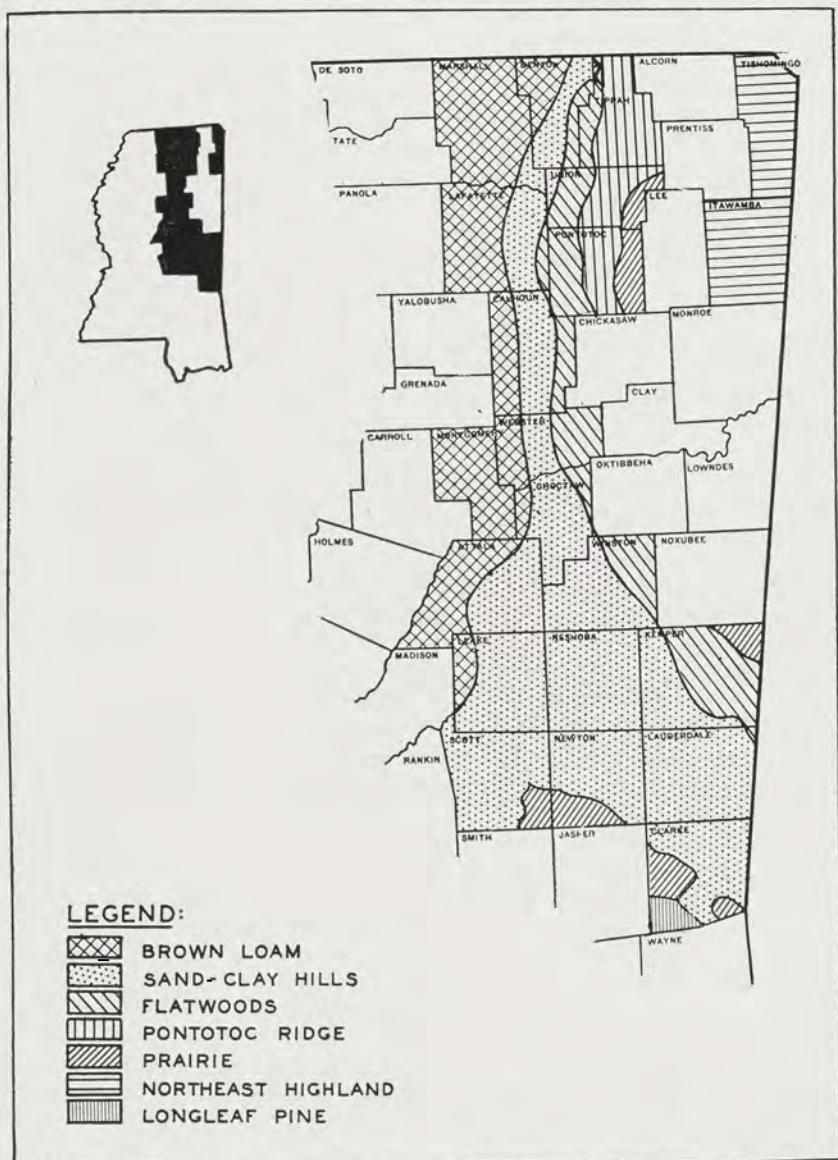


Figure 1. Physiographic divisions of the Shortleaf Pine type-of-farming Area.

Source: "Soils Guide for Mississippi," by J. C. Scott, Extension Soils Specialist.



(Figure 1). Two counties in the northeast corner of the State are also included with this Area even though separated from it by a narrow strip of the Northeast Prairie type-of-farming Area.

### Land Use

In 1940, land in farms accounted for 68 percent of all land in the Area. For the State as a whole 63 percent of all land was in farms. Of the total farm land in the Area in 1940, 32 percent was in cropland, 14 percent in plowable pasture, 33 percent in woods, and 21 percent in other uses. For the State as a whole these figures were 38, 14, 32, and 16 percent, respectively. Crop acreages have declined in the Shortleaf Pine Area since 1920. Of the land in crops in 1939, 27 percent was in cotton, 43 percent in corn, and 9 percent in tame hay. (Table 1).

### Physical Resources<sup>1/</sup>

The average frost-free season ranges from 210 days in the northern part of the Shortleaf Pine Area to 240 days in the southern part. Late summer droughts are not infrequent, and the falls are usually dry. Annual precipitation ranges from an average of 47.7 inches in Pontotoc County to 59.1 inches in Newton.<sup>2/</sup>

Soils were developed principally from the clays and sands deposited in the ancient Gulf of Mexico, which is now known as the Gulf Coastal Plain. The principal upland soil series developed from this material in the Shortleaf Pine Area include Kirvin, Ruston, Shubuta, Cuthbert, and Susquehanna. The lighter soils (Ruston and Kirvin) are very satisfactory for row crops when slopes are not too steep. The Shubuta, Cuthbert, and Susquehanna soil series were developed from heavy material and are less suited to row crops. Terrace land soil series in these same areas include Prentiss, Kalmia, Stough, and Myatt. Prentiss and Kalmia, when not too sandy, are well suited to the production of row crops, as well as oats and lespedeza. Stough, an imperfectly drained, and Myatt, a poorly drained series, are more suitable for pasture and

Table 1. Land use in the Shortleaf Pine Area of Mississippi, 1920-40, with comparison.<sup>1/</sup>

Item	Shortleaf Pine Area			Mississippi
	1920	1930	1940	1940
Total land area in farms.....	Percent 73	Percent 66	Percent 68	Percent 63
Farm land in cropland <sup>2/</sup> .....	28	30	32	38
Farm land in plowable pasture.....	3/	8	14	14
Farm land in woodland.....	44	42	33	32
Farm land in other uses.....	28 <sup>4/</sup>	20	21	16
Cropland in corn.....	53	37	43	40
Cropland in cotton.....	32	44	27	33
Cropland in tame hay.....	7	4	9	4

<sup>1/</sup>U. S. Census of Agriculture. <sup>2/</sup>Cropland in 1920 is the sum of "land in principal crops;" in 1930 and 1940, it is the sum of "harvested" and "failure." <sup>3/</sup>Not ascertainable. <sup>4/</sup>For 1920 includes plowable pasture.

<sup>1/</sup>Acknowledgment is due Kenneth V. Goodman, Associate Soil Scientist of the BPISAE, who prepared the soils phases of this discussion.

<sup>2/</sup>U. S. Department of Agriculture Yearbook, "Climate and Man," 1941.



hay crops. Better drained soils of the bottomland include the Ocklocknee and Iuka series, both of which are well suited to corn and, in a lesser degree, to cotton. The Bibb series is poorly drained and is best suited to pasture or forestry.

A narrow strip of silty material, supposedly wind-blown, ranging in thickness from a few inches to many feet, has been deposited along the western side of this Area, particularly in Marshall and Lafayette Counties in the north-western corner. The principal soil series of the upland of this small section include Memphis, Loring, Grenada, Calloway, and Henry, ranging in degree of drainage from very good to poor. Most of the best cropland occurs in the Memphis, Loring, and Grenada series. Because of the silty material in the soils of these series, however, the best cropland is readily subject to accelerated erosion and needs careful handling to prevent the formation of gullies. A wide variety of crops, except those requiring sandy textures—like peanuts—can be grown on these series, and yields are generally high with moderate applications of complete fertilizer. The Calloway and Henry series are somewhat poorly drained, occur largely on fairly level land, and are more adapted to pasture, lespedeza, and corn than to other crops. The principal soil series on the terrace land associated with the foregoing soils include Richland, Lintonia, Olivier, Calhoun, and Carroll. The best cropland is found in the first two series and will grow almost any of the common crops. In the Calhoun and Carroll series the cleared land is generally imperfectly or poorly drained and is better adapted to pasture, lespedeza, sorghum, or corn. In some areas certain soils are somewhat alkaline and may be adapted to alfalfa. Bottomland soil series with about the same range in drainage and adaptation as the foregoing terrace land include Vicksburg, Collins, Falaya, and Waverly. The cropland in the first two series is of good quality and is adapted to the common crops of the vicinity, while that in the latter two is more adapted to pastures, sorghums, oats, corn, or forestry, depending on the particular soil type (fine sandy loam or clay) involved.

Between the soil series developed from the sands and clays of the "Clay Hills" proper and the series developed from the "wind-blown" silt deposits (on the western side) are several series with mixed materials. The most important are the Lexington, Providence, and Falkner, and associated imperfectly or poorly drained soils. These soils as a unit have very thin silty or very fine sandy loam surfaces underlain by sandy or clayey material, and are very erosive. Great care must be exercised in handling the cropland in such types. Most of the common crops of the vicinity are grown on the well-drained cropland, while pastures and grain crops are grown on the cleared land of the imperfectly or poorly drained types. On the sandy types of the Lexington and Providence series sweetpotatoes and peanuts, in addition to the other crops, can be grown successfully. The soil series on the terrace land derived principally from mixed materials include Dexter, Free-land, Hatchie, and Almo, grading from very well drained to poorly drained. The best cropland, and probably the most extensive in the terrace land, is found in the first three series, and the highest yielding land occurs in the first two within this group. The series found on the bottomland include Shannon, Hymon, Ina, and Beechy. The best cropland is found in the first two series, the poorest in the last. The Ina series is better for pasture and



corn, but has been used occasionally for other crops. The Beechy series is almost entirely adapted to forestry or pasture.

Most upland soils in the "mixed" soil areas and sand-clay hills proper (comprising the major portion of the Shortleaf Pine Area) need large applications of fertilizer for consistently good yields, but in the silty or "Brown Loam" part of the Shortleaf Pine Area, the amount of fertilizer required is more variable, depending upon the soil, crop, and rainfall relationships.<sup>3</sup> It is possible to apply too much fertilizer in this section, in that the higher yield may not justify the cost of the additional fertilizer. This is also true for some of the bottom and terrace lands, although up to the present time the error has been to apply too little fertilizer, even on these soils.

The amount of really good land in the Shortleaf Pine Area is not high. Of the cropland within this area, probably not over 30 percent could be considered as first-class for all the major crops, including peanuts and sweetpotatoes. Many of the soils with heavy textures and imperfect drainage must be handled with special care to prevent puddling of the soil or to prevent crop losses from diseases or weeds that flourish in these damp soils. About 90 percent of the cropland is suited to crops of one sort or another, but the kind of crops selected will depend to a large extent on the soil types, degree of erosion, and the size of farms. Peanuts, for example, should not be grown in heavy soil types, and sweetpotatoes should not be grown in poorly drained soils. Corn, on the other hand, should not be grown in very deep sandy soils or on the very shallow, gravelly, or rocky types. Cotton needs comparatively heavy soils for best results, and truck crops need loamy soils with good moisture-holding capacity.

The topography ranges from rolling to steep. Although there are numerous small areas of bottomland in the Shortleaf Pine Area, some of the most rugged land in the State is found there. The character of the soil, the type of agriculture generally followed, and the topography combine to make conditions favorable for excessive erosion. An evidence of the effect of erosion has been the abandonment of many acres of cropland in the Area. (Abandoned acres have been practically replaced by bringing new land into cultivation.) Soil losses can be minimized without interfering with usual farm operations by the adoption of conservation practices. The surface has barely been scratched so far as total erosion control needs are concerned.

Timber ranks next to agriculture as a source of income in this Area. While one-third of all land in farms in 1939 was in forest, farmers reported that only 3 percent of the value of all farm products sold or traded came from forest products. For the State as a whole this amounted to only 1.1 percent.<sup>4</sup> A large part of timber production in the Shortleaf Pine Area comes from nonfarm forests. Since 1939, returns from timber on farms have increased materially, as cutting has exceeded growth during the war period.

The development of mineral resources in the Area has not been of importance.

<sup>3</sup>/"Brown Loam" soils occur in the Shortleaf Pine type-of-farming Area as delineated on figure 1 largely because county lines were followed in outlining the area for consideration in this bulletin.

<sup>4</sup>U. S. Census of Agriculture, 1940.



## Population

The 1940 population of the Shortleaf Pine Area was 476,393, of which 414,406, or 87 percent, were reported as rural (farm and nonfarm). Rural-farm population was reported as 71 percent of the Area's population. The proportion of the total population residing in rural parts of this Area is somewhat greater than in the State as a whole. Likewise, the proportion of the total population which is white, is higher in this Area, 65 percent, compared with 51 percent for the State. Increases in total and in all segments of the population, rural, urban, white, and negro, were at a lower rate in this Area between 1900 and 1940 than for the whole State. (Table 2).

Estimates indicate that this Area lost 14 percent of its rural-farm population and 29 percent of its farm labor force between April 1940 and March 1943. This decrease was greater than in other parts of Mississippi. The movement of workers from the Area has continued since 1943, though probably at a reduced rate. Whether this labor will return to the Area after the war will depend on alternative employment opportunities. In addition to those who have left the Area since 1940, there are many who continue to reside there but commute daily to non-farm jobs in Memphis and other nearby urban centers.

The high ratio of workers to resources is indicated by the fact that agricultural production has increased during the war even though an estimated 29 percent of the pre-war farm labor force had left by March 1943. There is some question whether the remaining labor force is fully utilized except during the cotton-picking season. Table 3 compares agricultural resources per rural resident of the Shortleaf Pine Area with resources available per rural resident in other type-of-farming areas.

## Industrial Development

In 1940, 61 percent of the people employed in the Shortleaf Pine Area were engaged in agriculture, slightly higher than the State average of 58 percent. For the whole South 31.5 percent were employed in agriculture, but in the United States only 18.5 percent were thus employed. (Table 4).

In 1940, only 4 percent of all employed people were engaged in manufacturing, exclusive of sawmills, planing mills, and logging, as compared with

Table 2. Total population 1900-1940, composition and trends, Shortleaf Pine Area of Mississippi, with comparison.<sup>1/</sup>

Item	Shortleaf Pine Area			Mississippi		
	1900	1940	Percent change	1900	1940	Percent change
Total population .....	372,308	476,392	28.0	1,551,270	2,183,796	41.0
Negro population .....	147,619	165,003	12.0	907,630	1,074,578	18.0
Rural population .....	353,444	414,406	17.0	1,431,235	1,750,914	22.0
Percent Negro .....	39.6	34.6	-5.0	58.5	49.2	9.3
Percent rural .....	95.5	87.0	-8.5	92.3	80.2	12.1
Percent rural-farm .....	— <sup>2/</sup>	71.4	—	— <sup>2/</sup>	64.1	—
Percent rural-nonfarm .....	— <sup>2/</sup>	15.6	—	— <sup>2/</sup>	16.1	—

<sup>1/</sup>U. S. Census of Population, 1900 and 1940.

<sup>2/</sup>Not available.

Table 3. Land use and livestock numbers per rural resident, by type-of-farming areas, Mississippi, 1943.<sup>1/</sup>

Item	Type-of-farming area							State
	Short-leaf Pine	Delta	Brown Loam	North-east Prairie	Long-leaf Pine	Coastal Plain	Gulf Coast	
<b>Land use:</b>								
Acres of farmland .....	17.7	10.4	16.5	15.5	16.8	16.9	14.4	15.3
Acres of cropland .....	6.6	8.0	6.5	6.7	6.7	5.4	2.6	6.8
Acres of cotton .....	1.5	3.4	1.8	1.6	1.5	0.5	— <sup>2/</sup>	2.0
Acres of corn .....	2.7	1.7	2.2	3.6	2.9	1.8	0.8	2.3
<b>Livestock and live-stock products:</b>								
Milk cows, no. ....	0.5	0.2	0.4	0.7	0.4	0.4	0.6	0.4
Cattle and calves, no. ....	1.1	0.4	1.5	1.3	1.3	1.6	2.5	1.1
Sows farrowed, no. ....	0.2	0.2	0.3	0.2	0.2	0.4	0.4	0.2
Milk produced, lbs. ....	1,260	631	1,113	2,081	968	893	1,692	1,127
Eggs produced, doz. ....	53	25	36	43	59	49	112	42

<sup>1/</sup>Computed by applying the change in total population of rural counties as indicated by the U. S. Census of Population for 1940 and Ration Book No. 2 registration to the rural farm population of the same counties as reported by the Census.

<sup>2/</sup>Less than 0.05 acres per rural resident.

Table 4. Occupation of employed persons in the Shortleaf Pine Area of Mississippi, 1940, with comparisons.<sup>1/</sup>

Item	Shortleaf Pine Area	Mississippi	South <sup>2/</sup>	United States
Total employed, number .....	142,468	727,455	13,777,858	45,166,083
Percent in agriculture .....	60.8	57.7	31.5	18.5
Percent in manufacturing .....	10.0	9.2	15.9	23.4
Percent in manufacturing (excluding sawmills, planing mills, and logging) .....	4.0	5.3	13.5	22.1
Percent in service trades <sup>3/</sup> .....	24.9	28.2	43.9	49.8
Percent in other occupations <sup>4/</sup> .....	3.1	3.9	7.6	6.8
Percent not reporting occupations .....	1.2	1.0	1.1	1.5

<sup>1/</sup>Census of Population, 1940. Does not include employment on public emergency work.

<sup>2/</sup>The "South" includes the states of Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia, and the District of Columbia.

<sup>3/</sup>Includes transportation, communication, and other public utilities; wholesale and retail trade, finance, insurance and real estate; business and repair services; personal services, amusement, recreation and related services; professional and related services; and government.

<sup>4/</sup>Includes construction, mining, fishing, and forestry (except logging).

5.3 percent for the State, 13.5 percent for the South, and 22.1 percent for the Nation. Service trade employed 25 percent of the people employed in the Shortleaf Pine Area in 1940, 28 percent in the State, 44 percent in the South, and 50 percent in the United States.

### Institutional Resources

Marketing facilities for handling the cotton crop are adequate. In addition to 280 cotton gins, there were 23 cotton warehouses in the Area in 1942, 12 of which were equipped with compresses. There were also four cotton oil mills in the Area.

A number of assembling and processing plants for dairy products are



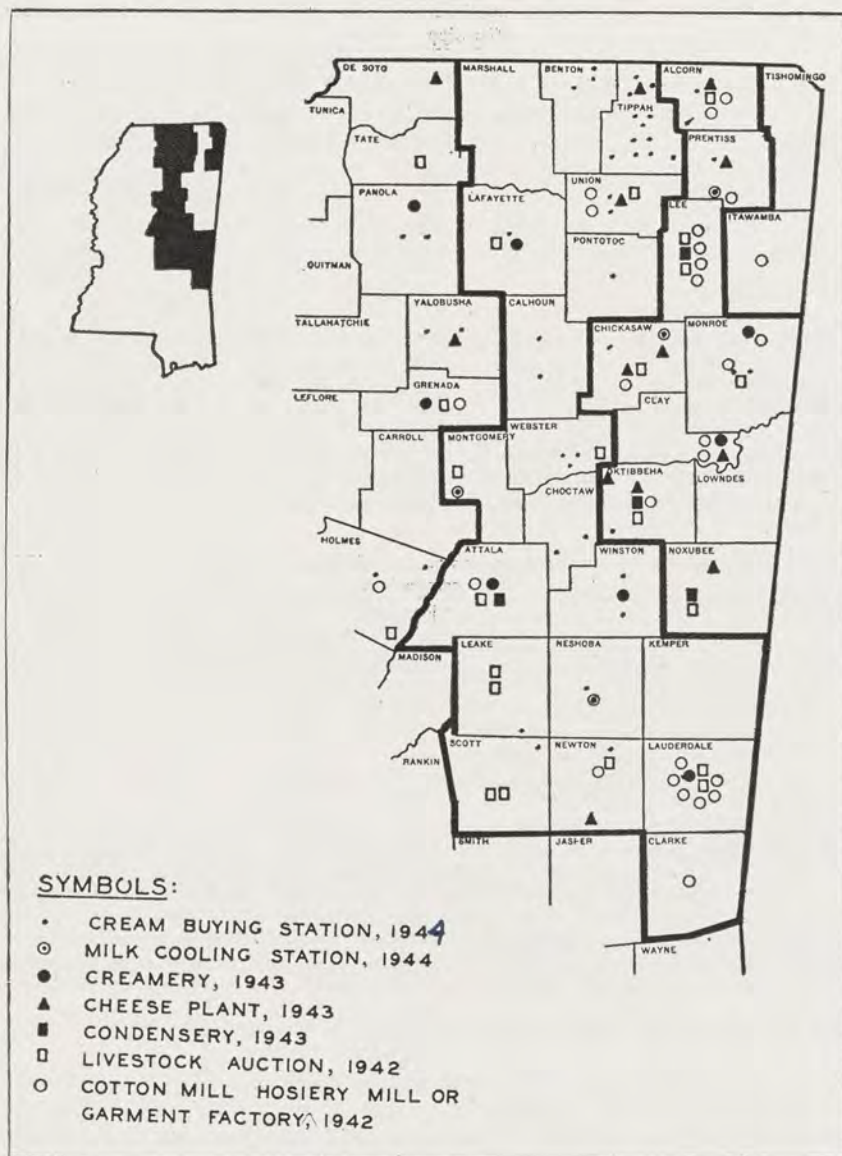


Figure 2. Marketing and processing facilities.

located in the Area. Included are 5 creameries, 5 cheese plants, 1 milk condensing plant, 1 powdered milk plant, 3 ice cream plants, 2 cooling stations, and 32 cream buying stations. (Figure 2). Many communities are not served by milk or cream routes and farmers must provide their own transportation if they are to sell dairy products. Transportation costs involved prevent many potential milk producers (at present prices) from developing the dairy

enterprise. Some of the existing milk routes could be extended, but the scarcity of trucks and drivers under war conditions has limited extensions or the starting of new routes. During the war many potential producers of dairy products not on milk routes and desiring to get into the dairy business could sell butterfat in the form of cream to local cream buying stations.

Facilities for marketing livestock appear adequate. There are several slaughter establishments and one meat packing plant in the Area.

Marketing facilities for farm products, other than cotton, dairy, livestock, and timber, have not been developed. Some trading centers offer adequate markets for poultry and eggs, while others do not.

## FARM ORGANIZATION AND MANAGEMENT

### Distribution of Farms According to Size and Type

Small cotton-type farms predominate in this Area. Although farms have been considered small, medium, or large in size, according to whether or not they were operated by one, two, or three or more families, by many measures 95 percent of the farms would be considered small.<sup>5/</sup> According to the criteria used in classifying a 20 percent sample of operating units as defined by the AAA, however, 65 percent were one-family, 21 percent were two-family, and 14 percent were units with three or more families.<sup>6/</sup>

The cotton-type farm predominates in all size groups. Although farms have been grouped into five types, the cotton crop is of great importance in every type defined. Fifty-one percent of all farms were classified as of the cotton type, 28 percent general, 10 percent cotton-dairy, 4 percent cotton-cattle, and 7 percent cotton-livestock. (Table 5).

Farm types used as the basis for classifying Shortleaf Pine Area farms are defined as follows:

(1) **Cotton:** farms with at least 20 percent of their cropland in cotton, less than four cows, and no other important source of income.

Table 5. Percentage distribution of farms by type and size in the Shortleaf Pine Area, Mississippi, 1941.<sup>1/</sup>

Type of farm	All sizes	Size of farm (No. of families per farm)		
		One family	Two families	Three or more families
	Percent	Percent	Percent	Percent
Cotton .....	51	35	11	5
General .....	28	21	5	2
Cotton-dairy .....	10	4	3	3
Cotton-cattle .....	4	2	1	1
Cotton-livestock .....	7	3	1	3
All types .....	100	65	21	14

<sup>1/</sup>Based on a 20 percent sample of AAA worksheets from Calhoun, Leake, and Winston Counties.

<sup>5/</sup>The number of families per farm has been used as the measure of farm size in this analysis. Acres of cropland per farm, regardless of the number of families per farm, would also have been a satisfactory measure. It is believed that results would have been very much the same as those in table 5 had cropland rather than number of families been the measure.

<sup>6/</sup>According to the census, 37 percent of all farms were operated by croppers in 1939. This ties in closely with the classification of AAA worksheets in that 35 percent of all farm units were found to be operated by 2 or more families.



(2) **General:** farms without enough cotton to be included within the cotton type, or enough livestock to be included within the livestock type.

(3) **Cotton-livestock:** farms with at least 20 percent of their cropland in cotton and a substantial part of their income from livestock.

(4) **Cotton-dairy:** farms on which cotton and dairy cows account for most of the cash income, the two enterprises being equal, or nearly equal, in importance. In one sense, this might be considered a sub-type of (3) above.

(4) **Cotton-cattle:** farms on which cattle, for dairy replacement or beef purposes (or both), are of importance, but on which cotton is the major crop. This type group might also be considered a sub-type of (3) above.

Size and type of farm are also indicated by the source and amount of farm income. In 1939, 71 percent of the value of all farm products sold or traded was from crops, 26 percent from livestock, and 3 percent from forest products. Farm income from products sold, traded, or used, on the average, amounted to only \$410 per "census farm," of which 44 percent represented the value of farm products used by the household. (Table 6).

Table 6. Source and average amount of income per "census farm," Shortleaf Pine Area, 1929 and 1939, with comparison.<sup>1/</sup>

Item	Shortleaf Pine Area		Mississippi
	1929	1939	1939
Value of all farm products sold, traded, or used, dollars	782	410	546
Value of all farm products sold or traded, dollars	579	230	397
Percent from crops	80	71	84
Percent from livestock	17	26	15
Percent from forest products	3	3	1
Value of all farm products used by farm household, dol.	203	180	149
Percent of farms on which value of farm products sold, traded, or used by household amounted to:			
Less than \$250	2/	32	25
Less than \$400	2/	62	49

<sup>1/</sup>U. S. Census of Agriculture.

<sup>2/</sup>Not available.

### Cropland Resources of Farms in Size-Type Groups

As stated elsewhere, cropland resources per farm are inadequate with present technology and would remain inadequate with improved technology unless the acreage of cropland per family were increased. This is not to imply, however, that improved technology is not desirable. The use of better farm practices as a means toward higher productivity would raise the income of farm families, but could not raise it to an adequate level because the cropland available per capita, under 1941 conditions, would not permit.

According to the analysis of 1941 AAA records, approximately 29 acres of cropland (part of which was idle) were available per farm family.<sup>1/</sup>

The situation (per family) differed but little by size of farm, although more cropland was usually available per family on farms with livestock as an important source of income. (Table 7). Farms with livestock as an important enterprise represented only 21 percent of all farms. Families on cotton type farms had available, on the average, only 25 acres of cropland. The

<sup>1/</sup>In 1940 the average "census farm" in the Shortleaf Pine Area had 24.5 acres of crops, of which 6.5 were in cotton and 10.5 in corn.

average farm had between 1 and 2 families—1.7, as nearly as can be estimated. Twenty-three percent of the farms had less than 20 acres of cropland, while 87 percent had less than 80. (Table 8).

Table 7. Cropland acreage per farm, by type and size of farm, Shortleaf Pine Area, Mississippi, 1941.<sup>1/</sup>

Type of farm	Acres of cropland per farm, by size of farm			
	Average for all sizes of farms	Farms with one family	Farms with two families	Farms with three or more families
Cotton	36	28	46	77
General	36	29	49	85
Cotton-dairy	75	47	57	119
Cotton-cattle	71	44	62	142
Cotton-livestock	119	66	52	176
All types	47	32	49	117

<sup>1/</sup>Based on a 20 percent sample of AAA worksheets from sample counties.

Table 8. Distribution of farms by acres in cropland per farm, Shortleaf Pine Area, Mississippi, 1941.<sup>1/</sup>

Acres of cropland	Percent	Cumulative percentage
0-19	23.2	—
20-39	35.9	59.1
40-59	19.4	78.5
60-79	8.3	86.8
80 and above	13.2	100.0
Total	100.0	—

<sup>1/</sup>Based on a 20 percent sample of AAA worksheets in sample counties.

### Utilization of Land in Farms

In 1940 the average "census farm" in the Shortleaf Pine Area had 24.5 acres of crops, of which 6.5 acres were in cotton, 10.5 in corn, 7.5 in other crops, and 25.5 in woods. (Table 9). This checks very closely with the acreage available per family in 1941 according to AAA records. A more detailed analysis of land use on farms representative of specific size-type groups is indicated in another part of this bulletin.

Table 9. Land use on farms in the Shortleaf Pine Area, 1920-1940, with comparison.<sup>1/</sup>

Average acres per farm	Shortleaf Pine Area			Mississippi
	1920	1930	1940	1940
Total	86.0	69.6	76.4	65.8
Crops	36.7	21.0	24.5	25.3
Cotton	7.7	10.4	6.5	8.4
Corn	12.7	8.4	10.5	10.2
Other crops	16.3	2.2	7.5	6.7
Woods	37.7	29.0	25.5	20.9
Other uses	11.6	19.6	26.4	18.6

<sup>1/</sup>U. S. Census of Agriculture.

### Tenure and Color of Farm Operators

Owners operated 42 percent of the farms and 65 percent of the total farm acreage of the Shortleaf Pine Area in 1940. This was slightly higher than in 1930, but lower than in 1920. Farm ownership is more general in



this Area than in the State as a whole. White operators are also relatively more numerous. There has been little change in the last 20 years either in the percentage of farms operated by whites or in the proportion of the total acres operated by whites. The percentage of farm land operated by white owners of this Area is higher than in the remainder of the State. (Table 10).

Farm operators in this Area, on the average, are slightly older than in the State as a whole. In 1940 the average age of all operators in the Area was reported by the census as 44 years. Full owners averaged 50 years of age.

Table 10. Tenure and color of farm operators in the Shortleaf Pine Area of Mississippi, 1920-1940, with comparison.<sup>1/</sup>

Item	Shortleaf Pine Area			Mississippi
	1920	1930	1940	1940
Percent of farms operated by owners.....	46	38	42	30
Percent of farm land operated by owners <sup>2/</sup> .....	68	64	65	59
Percent of farms operated by whites.....	67	66	65	45
Percent of farm land operated by whites.....	78	75	78	72
Percent of farm land operated by white owners.....	3 <sup>3/</sup>	49	50	44

<sup>1/</sup>U. S. Census of Agriculture.

<sup>2/</sup>Includes that owned and operated by full owners plus that operated by part owners.

<sup>3/</sup>Not available.

## The Agricultural Pattern During World War II

During World War II the pattern of agriculture in the Shortleaf Pine Area has changed, but the changes have not been as great as in areas where peanuts, for example, have expanded so rapidly. Some of the shifts under way before the war, particularly the shift from corn to oats, have continued. The acreage of cowpeas has declined markedly, chiefly because of the high price of seed. The acreage of idle cropland has doubled since 1941, and is one of the reasons why yields have increased during the war. (Table 11). Cropland left idle was relatively inferior in most cases. Small farm operators and their families leaving for war work was primarily responsible for the decrease in crop acreage. Data concerning acreage shifts for other crops and for livestock are shown in table 11.

Table 11. Land use, livestock numbers and livestock products in the Shortleaf Pine Area of Mississippi, 1941-1944, and suggested goals for 1945.<sup>1/</sup>

Item	Acreage	1941	1942	1943	1944	Suggested goal 1945 <sup>2/</sup>
		1,000	1,000	1,000	1,000	1,000
Crop acres:		acres	acres	acres	acres	acres
Corn _____	Planted	835.0	802.0	755.0	709.0	732.0
Oats for grain _____	Harvested	20.7	26.5	34.7	45.0	73.5
All tame hay _____	do.	222.2	222.0	196.0	194.0	252.1
Sorghums (except sirup) _____	Planted	7.8	7.1	8.1	8.6	7.9
Soybeans for beans _____	Harvested	6.9	14.0	11.0	9.0	10.0
Cowpeas for peas _____	do.	76.4	59.2	25.2	18.0	(6)
Peanuts, picked and threshed _____	do.	10.7	30.5	12.5	11.8	15.7
Cotton _____	Planted	425.6	429.0	458.5	429.0	452.4
Irish potatoes _____	do.	5.2	6.5	6.4	6.2	7.0
Sweetpotatoes _____	do.	13.7	14.4	17.2	14.8	18.1
Seed crops _____	Harvested	10.0	10.0	9.0	10.0	11.5
Cropland pasture _____	Planted	30.0	30.0	30.0	30.0	*
Idle cropland _____	—	210.0	235.0	324.0	416.0	*
Total cropland _____	—	1,938.0	1,938.0	1,938.0	1,938.0	1,938.0
Wild hay _____	Harvested	24.4	20.7	22.0	22.8	*
Open permanent pasture _____	—	1,127.6	1,131.3	1,130.0	1,129.2	*
Woodland pasture _____	—	944.0	944.0	940.0	940.0	*
Total land in farms _____	—	5,204.0	5,204.0	5,200.0	5,200.0	*
		1,000	1,000	1,000	1,000	1,000
Livestock and livestock products:	Unit	units	units	units	units	units
Milk cows _____	Number	141.9	149.9	156.0	159.0	162.0
Other cattle _____	do.	159.3	162.3	171.0	181.0	179.2
Hens and pullets _____	do.	1,692.0	1,886.0	2,141.0	2,366.0	2,029.0
Sows farrowed _____	do.	25.9	35.6	48.7	34.7	<sup>3/</sup>
Milk produced _____	1000 lbs.	349.0	375.0	365.8	373.0	400.8
Eggs produced _____	1000 doz.	11.2	13.3	13.8	14.4	*
Chickens raised <sup>4/</sup> _____	Number	4,059.0	4,827.0	5,685.0	4,780.0	3,878.0
Turkeys raised _____	do.	16.0	16.0	17.4	16.7	18.2

<sup>1/</sup>Based on unofficial county estimates.

<sup>2/</sup>Mississippi goals handbook for 1945.

<sup>3/</sup>Goal for spring farrowing only.

<sup>4/</sup>Including commercial broilers except for 1945 goal.

\*No goal.

## Usual Versus Improved Production Practices

The avenue of improved crop and livestock practices offers the best opportunity for farmers in this Area to increase farm income. Crop yields have been much too low. Through improved practices yields can be substantially increased and returns per acre raised accordingly. Cotton yields, for example, could be raised an estimated 46 percent over the level considered normal for 1943, while corn yields could be almost doubled. Yields of other important crops could also be raised significantly. Estimates concerning yield increases possible through improved production practices were made by experiment station agronomists. (Table 12).

The rapidity with which these yield increases (for the entire Area) can be achieved depends partly upon the rapidity with which educational services can be expanded. Prices, markets, and credit facilities are other important factors. Any individual farmer, however, could raise his yields to the in-



Table 12. Estimates of specified crop yields possible as a result of following recommended improved production practices, Shortleaf Pine Area of Mississippi.

Crop	Acreage	Unit	Yield per acre			
			Average	1943	With	Increase
			1937-41 1/	Normal 2/	improved practices 3/	with improved practices
			Units	Units	Units	Percent
Corn, all _____	Planted	Bu.	13.8	14.1	28	99
Soybeans for beans _____	Harvested	Bu.	6.4	10.5	12	14
Cowpeas for peas _____	do.	Bu.	4.8	5.1	15	194
Peanuts threshed _____	do.	Lb.	460	460	800	74
Cotton _____	Planted	Lb.	211	240	350	46
Sorghum for sirup _____	Harvested	Gal.	69	70	100	43
Sugarcane for sirup _____	do.	Gal.	134	133	200	50
Irish potatoes _____	Planted	Bu.	58	59	75	27
Sweetpotatoes _____	do.	Bu.	85	83	125	51
Oats for grain _____	Harvested	Bu.	21	21.5	35	63
Hay, all tame _____	do.	Ton	1.2	1.15	1.4	22
Sorghum for hay _____	do.	Ton	1.2	1.15	1.4	22
Sorghum for silage _____	do.	Ton	—	—	15	—

1/ Base data from unofficial estimates.

2/ "Normal" yield as used in this situation means the yield that could have been expected in 1943 had weather conditions been normal. Actual yields were above or below this estimate. Its chief purpose is to show the progress that has been made in improving yields since the base period. This, in turn, would measure the progress that has been made in the adoption of improved practices.

3/ Assumes widespread adoption of improved crop production practices.

dedicated level within a year or two by following practices recommended by the experiment station.

Improved practices of most importance include: (1) Proper fertilization, which in turn involves use of the correct amount, the recommended analysis, and correct placement in relation to the roots of the plant; (2) use of high quality seed of the recommended variety and strain; (3) seed treatment; (4) planting at the correct time; (5) using enough seed (involves correct spacing in the row and between rows); (6) proper cultivation; and (7) proper harvesting methods. Other bulletins of this Station can be consulted for additional details concerning improved practices.

The use of additional quantities of fertilizer and lime can be expected to have more influence on yields than other improved practices, but all are important. The quantity of fertilizer constituents used in 1943 (the year used for comparative purposes in table 12) was much greater than in 1941. (Table 13.) Opportunities exist, however, for the use of much greater quantities than have been used during any of the war years. Table 13 indicates the quantity of fertilizer elements used annually in the Shortleaf Pine Area during the period 1940-1944.

#### Cotton Production Practices

Proper fertilization is most important among improved cotton production practices. The use of recommended seed varieties and adapted strains could be extended, however, to an estimated additional 30 percent of the acreage. Most Shortleaf Pine Area farmers dust cotton (to control boll weevil) in seasons when that is necessary. (Table 16).

Although 81 percent of the cotton growers interviewed reported the use

Table 13. Quantity of fertilizer elements sold in the Shortleaf Pine Area of Mississippi, for use during the 1940-1944 crops years.<sup>1/</sup>

For crop of	Total all elements	Nitrogen (N)	Phosphate (P <sub>2</sub> O <sub>5</sub> )	Potash (K <sub>2</sub> O)
	tons	tons	tons	tons
1941	12,448	4,648	5,042	2,758
1942	13,303	4,181	6,079	3,143
1943	16,091	5,055	7,258	3,778
1944	16,627	6,461	6,706	3,460

<sup>1/</sup>Compiled from "County Fertilizer Data," State Department of Agriculture.

of fertilizer on cotton in 1941, the quantity applied per acre was much too low. Most growers—73 percent of those using fertilizer—applied between 200 and 300 pounds of mixed goods per acre, the "usual" rate being 200 pounds of 4-8-4. Recommendations specify 500 pounds of the 6-8-4 analysis. Less than 4 percent of the growers applied the recommended quantity of fertilizer in 1941 and few used the recommended analysis. Table 14 indicates the proportion of cotton growers interviewed who applied fertilizer at specified rates in 1941. Farmers have applied more fertilizer to cotton during the war years than in 1941. Even so, there continues to be an opportunity to increase yields substantially through heavier applications of the recommended analyses.

#### Corn Production Practices

Less than one-third (31 percent) of the Shortleaf Pine Area corn growers used fertilizer on corn in 1941, and few of that group fertilized correctly. In fact, only 3 percent applied nitrogen at the recommended rate, which is 30 pounds of nitrogen (N) or approximately 200 pounds nitrate of soda or its equivalent, per acre. Seventy-four percent of those using fertilizer used nitrate of soda. The usual rate of applying nitrate of soda, by those who used it, was 100 pounds per acre. A small proportion of those using nitrate

Table 14. Proportion of cotton growers applying mixed fertilizer to cotton at specified rates in 1941, Shortleaf Pine Area of Mississippi.<sup>1/</sup>

Rate of application	Proportion of growers applying at specified rate
Pounds per acre	Percent
0	19.0
25	.0
50	1.0
75	.0
100	3.0
125	1.0
150	3.0
175	3.0
200	21.0
225	3.0
250	10.0
275	2.0
300	23.0
325	.0
350	2.0
375	.0
400 and above	9.0
	100.0

<sup>1/</sup>Based on records from representative farms in important size-type groups.



of soda also used mixed fertilizer on corn. As with cotton, there is "much room for improvement" in corn fertilization practices followed by farmers in this Area. Table 15 indicates the proportion of farmers interviewed who applied nitrate of soda at specified rates in 1941. It is believed that most of the additional fertilizer purchased during the war years has been used on the cotton crop.

Other improved corn practices (table 16) include the use of adapted varieties and strains. Very few farmers used corn seed of recommended varieties and strains in 1943. The estimate is 5 percent. Recommendations do not refer to hybrid seed corn, inasmuch as satisfactory hybrids for general adoption throughout the State are not available. There are, however, improved strains available which if used more generally would materially increase yields. Proper cultivation and land selection are also considered important from the standpoint of increasing yields. Practically speaking, proper land selection involves keeping corn off the eroded hillsides, using such areas for close growing crops, pasture, or trees.

#### Improved Practices for Other Crops and Pasture

Significant increases can be made in the yield of cowpeas, peanuts, sweetpotatoes, oats, hay, and pastures. Details concerning these practices can be obtained by reference to table 16 and to other publications of the Mississippi Experiment Station.

Hay and pasture practices have been severely neglected. The yield of lespedeza hay, for example, could be raised greatly by applying 200 pounds of 20 percent superphosphate, or its equivalent, and harvesting at the proper stage. It is estimated that only 10 percent of the farmers applied phosphate on lespedeza in 1943. A somewhat larger proportion—perhaps 40 percent—harvested at the correct stage of maturity.

Better pastures are essential if the livestock raising possibilities of the Area are to be realized. Improving pastures appears to be expensive, but such practices as applying phosphate, lime, seeding, clearing and mowing, increase the carrying capacity of permanent pastures a great deal above that attainable from unimproved pastures. Temporary pastures for use in both winter and late summer are needed to supplement permanent pastures if

Table 15. Proportion of corn growers applying nitrate of soda on corn at specified rates in 1941, Shortleaf Pine Area of Mississippi.<sup>1/</sup>

Rate of application	Proportion of growers applying nitrate of soda at specified rate
Pounds per acre	Percent
0	77
25	0
50	3
75	2
100	14
125	0
150	1
175	0
200	1
225 and above	2
	100

<sup>1/</sup>Based on records from representative farms in important size-type groups.

Table 16. Estimated extent to which specified improved production practices were carried out in 1943, by crops, Shortleaf Pine Area, Mississippi.<sup>1/</sup>

Crop	Improved practice	Estimated propor- tion of acreage on which practice was used in 1943
		Percent
Cotton (Yields could be raised an estimated 45 percent)	Fertilizing with 500 lbs. 6-8-4 on upland or 500 lbs. 6-8-8 on bottomland	25
	Using seed of adapted varieties	70
	Dusting for boll weevil when conditions make it necessary	Need varies—an indication for 1943 would not be par- ticularly meaningful
Corn (Yields could be raised an estimated 95 percent)	Application of 100 lbs. ammonium nitrate per acre (or equivalent) <sup>2/</sup>	10
	Using seed of adapted varieties and strains as recommended	25
	Thorough cultivation at the proper time	40
	Selecting land properly (keeping corn off eroded hillsides)	80
Cowpeas (Yields could be raised an estimated 22 percent)	Application of 200 lbs. of 20 percent superphosphate (or its equivalent) per acre	15
	Using seed of adapted varieties as recommended	30
	Harvesting hay at right stage of maturity	40
Peanuts (Yields could be raised an estimated 60 percent)	Applying 100 lbs. of 20 percent superphosphate plus 50 lbs. of muriate of potash (or equivalent) per acre or good rotation program	20
	Using seed of adapted varieties and of good quality as recommended	20
	Keeping down weeds	20
Sweetpotatoes (Yields could be raised an estimated 50 percent)	Application of 800 lbs. 5-10-5 per acre	25
	Using seed of adapted strains	60
	Use of correct cultural methods—proper height of ridge, correct spacing of plants, correct planting date, care- ful handling at harvest time	70
Oats (Yields could be raised an estimated 60 percent)	Application of 100 lbs. ammonium nitrate (or equivalent) per acre	25
	Using adapted varieties of seed as recommended and enough seed per acre	65
	Harvesting with efficient machinery, cutting at proper stage of maturity	60
Lespedeza hay (Yields could be raised an estimated 50 percent)	Application of 200 lbs. 20 percent superphosphate (or equivalent) per acre	10
	Harvesting at correct stage of maturity and with efficient equipment	40
	Controlling weeds	15
Permanent pasture (Improved) (Carrying capacity could be increased an estimated 75 percent)	Application of from 200 to 300 lbs. 20 percent superphosphate (or equivalent)	10
	Application of 100 lbs. muriate of potash (or equivalent) each third year	2
	Stocking with correct number of animal units per acre	15
	Mowing to control weeds	20
Temporary pasture (Summer)	Application of from 200 to 300 lbs. 20 percent super- phosphate (or equivalent) and 100 pounds of am- monium nitrate on non-legumes plus 100 lbs. muriate of potash (or equivalent) per acre each third year	5
Temporary pasture (Winter)	Application of 200 lbs. 0-14-7 per acre	5
	Application of 100 lbs. ammonium nitrate (or equivalent) per acre on non-legumes	30

<sup>1/</sup>Estimates by technicians of the Mississippi Agricultural Experiment Station. It is believed that these practices "would pay" on practically the entire acreage grown in the Shortleaf Pine Area. In addition to the practices enumerated above, it is estimated that about 80 percent of the cropland in the area should be limed with an initial application of 1,000 pounds and repeated as required.

<sup>2/</sup>Equivalent of 100 pounds ammonium nitrate would be 200 pounds nitrate of soda, for example.



maximum returns are to be secured from livestock. Not only will requirements for the feeding of grain and storage roughage be reduced when adequate pastures are available, but more economical production will result.

A small grain, usually oats, seeded with a winter clover will generally provide winter grazing and offer some protection to the soil. Such grazing crops should be planted in late August or early September for best results and may be grown on land from which corn is to be harvested. When seeded to lespedeza in February, summer pasture or hay may be grown on the same land.

### Improved Livestock Practices

Livestock production rates—dozens of eggs per hen, gallons of milk per cow, or beef production per head—like crop yields, have been much too low. Realization of improved production returns will depend almost entirely on the success of a program to increase feed crop yields and the grazing capacity of pastures. It will also be necessary to substantially expand the acreage of pasture.

Improved grain feeding rates and the provision of adequate roughages are of most importance in increasing livestock production. The usual practice in 1941, for example, was to feed milk cows only 520 pounds of concentrates and 1,700 pounds of hay, compared with a suggested feeding rate of 1,400 pounds of concentrates and 2 tons of hay. Hens received only 25 pounds of concentrates, compared with a need for 85 pounds. (Table 17). Other practices of importance include better housing, culling, and disease and parasite control. Improved breeding of productive livestock would also help greatly.

If improved practices were followed milk production per cow could be raised as much as 90 percent, although it is not anticipated that the average for the Area could be raised to that extent within any reasonable length of time. Egg production per hen could be almost doubled.

Table 17. Usual and improved feeding rates for important classes of livestock, Shortleaf Pine Area of Mississippi.<sup>1/</sup>

Class of livestock	Usual feeding rates		Improved feeding rates	
	Concentrates	Hay	Concentrates	Hay
	Pounds	Pounds	Pounds	Pounds
Workstock .....	2,500	1,800	3,000	2,200
Milk cows .....	520	1,700	1,400	4,000
Hogs <sup>2/</sup> .....	3/	—	389	—
Chickens .....	25	—	85	—

<sup>1/</sup>"Usual rates" determined on basis of 1941 data from representative farms. Improved rates estimated by livestock production specialists of the Mississippi Agricultural Experiment Station.

<sup>2/</sup>Per hundred pounds of pork produced.

<sup>3/</sup>Not available.

### Per Acre Returns From Principal Crops

The acreage of cotton, corn, small grains, or any other crop a farmer decides to grow usually depends more on his estimate of expected per acre returns than on any other factor. Table 18 summarizes returns that might be expected from producing an acre of cotton, corn, sweetpotatoes, or oats and lespedeza. Returns shown in that table are not strictly comparable because

cotton is usually grown on the best land. Yields and returns from the other crops would undoubtedly be higher, in other words, if they were grown on land of the quality used for cotton.

Two measures for comparing returns from the principal crops of the Shortleaf Pine Area are used in table 18. These measures and their definitions are as follows:

(1) **Returns per acre over direct cash expenses** represent the amount left after cash expenses have been subtracted from gross income. All "out-of-pocket" cash expenses for producing the crop in question are taken into account.

(2) **Returns per acre to land and management** represent the returns after all production costs, exclusive of management and use of land, have been considered. Items included in addition to those in (1) above are: value of all labor used in producing the crop, value of horse or mule power, and the proportion of the farm machinery maintenance costs properly chargeable to the particular crop in question.

Per acre returns over direct cash expenses—\$49.70 for cotton, \$25.57 for corn, \$88.60 for sweetpotatoes, and \$28.13 for oats and lespedeza—were not

Table 18. Estimated per acre returns from principal crops with assumed post-war prices and improved yields, Shortleaf Pine Area of Mississippi.<sup>1/</sup>

Item	Cotton	Corn	Oats and lespedeza	Sweet-potatoes
Yield with improved practices:	Pounds	Bushels	Bu. & Tons	Bushels
Lint, grain, pork, or No. 1 potatoes .....	350	28	35	80
Cottonseed, hay, or No. 2 potatoes .....	577	"	1.4	45
Labor required per acre:	Hours	Hours	Hours	Hours
Man .....	135	40	21	100
Mule .....	42	35	26	55
Price per pound, ton, or bushel: <sup>2/</sup>	Dollars	Dollars	Dollars	Dollars
Lint, grain, or No. 1 potatoes .....	0.14	1.04	0.58	1.25
Cottonseed, hay, or No. 2 potatoes .....	47.35	"	14.40	0.36
Gross value of crop <sup>3/</sup> .....	62.66	29.12	40.46	112.60
Direct cash expenses:				
Fertilizer <sup>4/</sup> .....	7.46	2.55	4.59	12.00
Seed .....	2.00	1.00	4.74	4.00
Ginning, bagging, and ties .....	3.50	"	"	"
Combining oats or containers for sweetpotatoes .....	"	"	3.00	8.00
Total .....	12.96	3.55	12.31	24.00
Returns over direct cash expenses (per acre) .....	49.70	25.57	28.13	88.60
Other expenses:				
Man labor at 20 cents per hr. (value or cost if hired) .....	27.00	8.00	4.20	20.00
Mule work at 13 cents per hr. ....	5.46	4.55	3.38	7.15
Machinery at 3 cents per hr. of mule labor .....	1.26	1.05	.78	1.65
Total expenses .....	46.68	17.15	20.69	52.80
Returns to land and management (per acre) .....	15.98	11.97	19.77	59.80

<sup>1/</sup>Returns per acre from principal crops are not strictly comparable in this analysis because yields are Area averages. As such, they represent yields from the class of land on which these crops are generally grown. The best land, for example, is ordinarily used for cotton. Yields of corn and oats would undoubtedly be higher if these crops were planted on the quality of land generally used for cotton.

<sup>2/</sup>Assumed prices for the post-war period.

<sup>3/</sup>Does not include the value of corn stover or oats for winter pasture.

<sup>4/</sup>Assumes fertilizer practices specified in table 16.



as high before the war as those shown in table 18. Attainment of this level of income per acre, which depends on the obtaining of improved yields, would make possible a relatively prosperous agriculture in the Shortleaf Pine Area.

Although returns to land and management would be almost as high from corn as from cotton (table 18), farmers could be expected to continue to grow relatively large acreages of cotton because it provides a way in which family labor can be employed. Per acre returns over direct cash expenses, in other words, are more meaningful to the farmer with his own labor supply than to the farmer who must hire most of his labor. Returns shown in table 18 are entirely dependent on realization of the assumed prices and upon obtaining the improved yields specified.

### Reorganizing Representative Farms

Farm incomes in the Shortleaf Pine Area are too low to provide adequately for farm needs. Furthermore, the predominant system of farming contributes to serious erosion damage. These conditions could be improved by adjusting the organization of individual farms to take advantage of improved crop and livestock production practices that will increase yields and conserve the soil simultaneously. Unfortunately, the number of production alternatives—crop or livestock enterprises that can successfully be substituted for cotton—is not great. Cotton remains of relatively great importance in each of the suggested plans for reorganizing the farm business. It has been necessary to suggest the expansion of enterprises which furnish use for the maximum amount of labor because the acreage of land available per family is very small. Even with reorganization, the usual family labor supply will not be fully employed during several months of the year.

While increasing the size of farms has not been shown as one of the desirable adjustments in the examples of farm reorganization which follow, it would be very desirable in many cases. The effects of increasing size of farm on income can be noted by comparing returns from farms of different sizes.

Individual farms representative of numerically important groups of farms, are used to illustrate the adjustments which should be made and to show the corresponding effects on income and expense items. Under reorganization the plans outlined would provide for a much higher standard of living, assuming realization of assumed prices.

Making the changes suggested would not be easy, but it is believed that many farmers could complete the suggested adjustments within 3 to 5 years. The relative desirability of alternative adjustments will depend to a large extent on prices for competing products after the war. Two different sets of prices have been used to test the adjustments suggested for individual farms. They are: (1) average prices received by Mississippi farmers during the period 1937-1941, and (2) assumed prices for the post-war period. Increases in income in the first adjustment over the original are then due to changes in enterprises and to the use of improved practices, while further increases, as shown in the second adjustment column for each illustrative example, result from price changes.

The most difficult phase in adjusting the farm organizations will be



that of increasing and improving the acreage of pasture. In most cases it will be necessary to clear woods for additional pasture acreages and improve the acreage already being used as open pasture by mowing, seeding, and fertilizing. Kudzu has been suggested as suitable for a part of the permanent pasture acreage on each farm reorganized. It is presumed that it would be planted on the steeper portions of the acreage selected for pasture.<sup>8/</sup> An adequate amount of pasture must be available if livestock enterprises, around which most improvements in the plans are built, are to succeed.

There is considerable evidence that part of the woodland on farms could be cleared and used for crops or pasture. Eighty-two farmers who were questioned concerning the woodland acreage of their farms reported that they had woodland totaling 4,699 acres, of which, in their opinion, 44 percent was suitable for cropland or pasture, and that an additional 14 percent would be suitable for pasture (but not cropland) if cleared. Returns from farm woodlands were quite low in 1941. Returns averaged only \$0.36 per acre on 82 farms surveyed, with most of the returns coming from sawtimber. Possibilities for increasing returns through improved woodland practices are excellent. Foresters report that annual returns from properly handled farm forests can be expected to range from \$2.00 to \$5.00 per acre.

Small grains would furnish winter cover for cropland on the reorganized farms. Seed of Austrian winter peas and the vetches are costly and often fail to produce a stand, or in the event the stand is satisfactory, fail to make enough growth to justify the expenditure. Fertilizer nutrients in many cases can be purchased most cheaply in the form of commercial fertilizer.

Plans for farm reorganization discussed in the following paragraphs include the use of improved crop yields shown in table 12. Improved livestock production rates are also assumed. The suggested acreage shifts would help, but yield increases must, of necessity, be obtained along with these shifts if the plans for raising farm income are to be successful.

Farm reorganization suggestions are designed for the "Clay Hills proper" section (figure 3) of the Shortleaf Pine type-of-farming Area, although they would apply in a general way to the Brown Loam soil areas which constitute a part of several counties along the western edge of the Area. The recommendations would not apply to the area known as the Pontotoc Ridge section, which extends along the northeast side of the Area. Woodland on farms in that section is too rugged and steep to make clearing for pastures a reasonable undertaking.

#### Reorganizing a Very Small Cotton Farm

In reorganizing a farm in this group it should be recognized that no amount of planning can reasonably be expected to enable a family with such a small acreage of cropland to earn an adequate income. By present standards, however, the increased amount of cash that would be available for family living would represent a very definite improvement. An operator would need additional land before he could raise earnings to a point that

<sup>8/</sup>Data concerning the details of establishing and maintaining permanent pastures can be obtained from Bulletin 356 of the Mississippi Agricultural Experiment Station. Data concerning the production of improved pastures can be obtained from Bulletin 412 of the same Station.



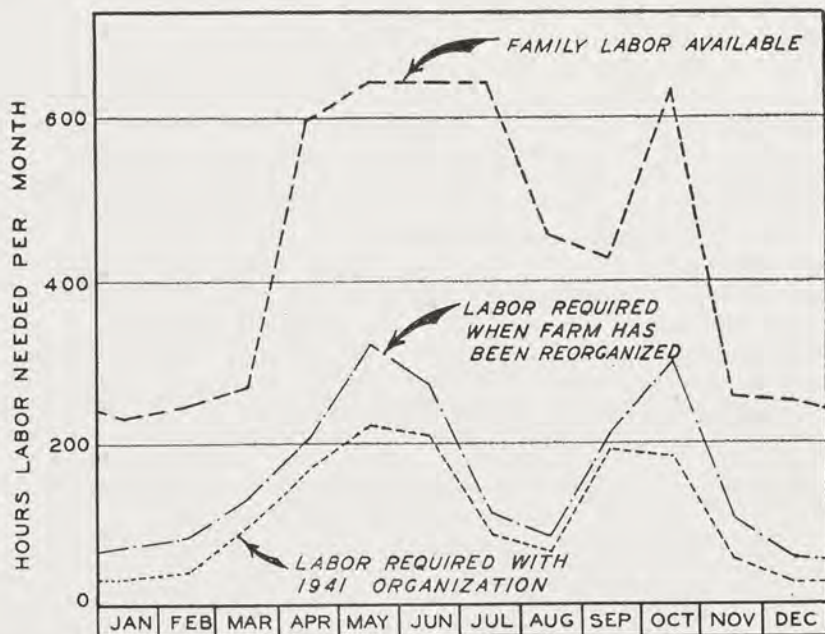


Figure 3. Labor available and required to operate a very small cotton farm before and after reorganization of crop and livestock enterprises and the adoption of improved production practices, Shortleaf Pine Area of Mississippi.

would be considered adequate by most standards. The plan of organization suggested for larger farms will indicate in a general way what the very small cotton farm operator might expect to accomplish by increasing the size of his holdings.

The very small cotton farm used for purposes of illustration in table 19 had only 16 acres of cropland, 2 acres of pasture, and 22 acres of woods in 1941.<sup>9</sup> Under the suggested system of reorganization the acreage of open pasture would be raised to 10, the acreage of woodland reduced proportionately. Enough woodland would remain to furnish fuel for the home.

Two crop acreage changes are important in the suggested plan. Corn acreage would be reduced from 8 to 5, with oats followed by lespedeza for hay being grown on the 3 acres. Two acres of sweetpotatoes would supplement 5 acres of cotton (which would remain the same as at present) as a source of cash income.

Livestock organization changes are limited to the addition of 2 milk cows and 30 hens. These enterprises would increase cash income by the sale of cream and eggs. (Table 19). With the number of livestock suggested it would be necessary to purchase feed valued at \$75 with 1937-41 prices.

If improved yields are obtained and suggested organizational changes

<sup>9</sup>The analysis of AAA records previously described indicates that almost one-fourth of the operating units in the Shortleaf Pine Area had less than 20 acres of cropland in 1941.

made, net cash income should be increased from \$92 to \$297, assuming 1937-41 prices for products bought or sold. If assumed post-war prices are realized, net cash income could be raised to an estimated \$551.

The amount of labor required to operate the reorganized farm would be increased but would not be expected to effectively utilize the full time of a family with an average supply of labor. Figure 3 compares the amount of family labor required to operate the very small cotton farm before and after reorganization. It has been assumed that the family consists of the operator, his wife, a son 15 years of age and a daughter 13. The son would be available for chore labor the year round and for field work during 5 months of the year. The daughter would not be considered available for work except during October, at which time she would pick cotton. The wife was considered 70 percent as effective as a man for most types of farm work. She was not considered available for chore labor because of household duties, but was considered available for field work during "peak" labor requirement periods.

#### Reorganizing a Small Cotton Farm

The general character of changes suggested for reorganizing a small cotton farm is the same as those suggested for the very small cotton farm. The essential difference is that the very small farm would sell butterfat as cream whereas this farm would sell whole milk as an additional source of cash income. Opportunities to earn a living on this unit are better because the amount of cropland available—30 acres compared with 16—is greater.

Success with the plan outlined in table 20 would necessitate conversion of 14 acres of woodland to permanent pasture and improvement of 6 acres of open land already being used for pasture. Cotton acreage would remain the same, but corn acreage would be reduced from 13 acres to 9. Eight acres of oats followed by lespedeza for hay and grazing would be grown on the land idle in the original organization and on the displaced corn acreage. Sweetpotatoes—4 acres—would supplement cash income from cotton. It would represent a new enterprise from the standpoint of production for sale. The cropland acreage (30) would remain the same after reorganizing this unit, although 4 acres of land idle under the original organization would be used for crops. Important changes in the livestock enterprise would include the addition of 3 milk cows and 20 chicken hens.

If livestock production rates and crop yields shown in table 12 were obtained on this farm, net cash farm income could reasonably be expected to increase from \$170 to \$664, if prices prevailing during the period 1937-41 were obtained. If the higher schedule of assumed prices were obtained (appendix table 1), net cash farm income could be expected to reach \$1,250—enough to raise the standard of living to what might be termed a minimum adequate level.

Adequate pasture for the livestock would be furnished by 20 acres of permanent pasture, of which 5 would be kudzu. Four acres of Korean lespedeza, and 8 acres of oats would also be available. The 4 acres of lespedeza and 8 acres of oats would provide an adequate amount of hay. Improved corn and oat yields would make possible the production of enough feed grain to eliminate the purchase of feed grains.



Table 19. Suggested organization and financial summary of a very small cotton farm, with comparison, Shortleaf Pine Area of Mississippi.

Item	Farm organization and income <sup>1/</sup>		
	Usual (1941) organization using 1937-41 prices	Suggested reorganization	
		Using 1937-41 prices	Using assumed post-war prices
Land use:	Acres	Acres	Acres
Cropland .....	16	16	16
Open permanent pasture .....	2	10	10
Woods and waste .....	22	14	14
Total .....	40	40	40
Crops:			
Cotton .....	5	5	5
Corn .....	8	5	5
Sweetpotatoes .....	—	2	2
Cowpeas for hay .....	1	—	—
Oats for hay .....	—	3	3
Annual pasture (lespedeza after oats) .....	—	(3)*	(3)
Oats for winter pasture (after corn) .....	—	(5)	(5)
Garden, orchard, sirup, and truck .....	1	1	1
Idle .....	1	—	—
Livestock:	Number	Number	Number
Workstock .....	1	1	1
Milk cows .....	1	3	3
Other cattle .....	1	2	2
Hogs .....	2	2	2
Hens .....	20	50	50
Value of property:	Dollars	Dollars	Dollars
Land .....	630	630	630
Improvements .....	300	400	400
Machinery .....	45	60	60
Livestock .....	112	255	335
Total .....	1,087	1,345	1,425
Cash receipts:			
Cotton, lint and seed .....	158	230	313
Sweetpotatoes .....	—	134	200
Butterfat .....	—	98	190
Beef calves .....	13	47	67
Chickens .....	—	17	24
Eggs .....	2	89	122
Total .....	173	615	916
Cash expenses:			
Fertilizer and lime .....	22	140	140
Seed .....	7	20	20
Other crop expenses .....	15	36	36
Livestock expenses .....	8	26	28
Feed .....	13	75	120
Machinery hire .....	2	4	4
Building and machinery repair .....	14	17	17
Total <sup>2/</sup> .....	81	318	365
Net cash farm income <sup>3/</sup> .....	92	297	551
Value of products used by family .....	129	175	247
Total farm family income <sup>4/</sup> .....	221	472	798
Interest on investment at 5 percent .....	54	67	71
Depreciation .....	26	32	32
Family labor earnings <sup>5/</sup> .....	141	373	695
Total hours of man labor required per year .....	1,367	1,950	1,950
Family earnings per hour of labor .....	0.10	0.19	0.36

<sup>1/</sup>See appendix table 1 for prices of specific farm products.

<sup>2/</sup>Exclusive of AAA payments.

<sup>3/</sup>Net cash farm income is the amount remaining after total cash expenditures for operating the farm have been subtracted from total receipts.

<sup>4/</sup>Total farm family income is computed by adding the value of farm products used by family to net cash farm income.

<sup>5/</sup>Family labor earnings are computed by subtracting depreciation and interest on the investment from total farm family income.

\*Figures in ( ) indicate double crop acres.

Table 20. Suggested organization and financial summary of a small cotton farm, with comparison, Shortleaf Pine Area of Mississippi.

Item	Farm organization and income <sup>1/</sup>		
	Usual (1941) organization using 1937-41 prices	Suggested reorganization	
		Using 1937-41 prices	Using assumed post-war prices
Land use:	Acres	Acres	Acres
Cropland .....	30	30	30
Open permanent pasture .....	6	20	20
Woods and waste .....	44	30	30
Total .....	80	80	80
Crops:			
Cotton .....	8	8	8
Corn planted alone .....	13	9	9
Sweetpotatoes .....	0.2	4	4
Oats for hay (after corn) .....	—	8	8
Lespedeza (after oats) .....	3.5	(8)*	(8)
Oats for winter cover (after sweetpotatoes) .....	—	(4)	(4)
Garden and orchard .....	1.3	1	1
Idle .....	4	—	—
Livestock on hand during year:	Number	Number	Number
Workstock .....	2	2	2
Milk cows .....	2	5	5
Other cattle .....	1	5	5
Hogs .....	2	2	2
Hens .....	30	50	50
Chickens .....	40	100	100
Value of farm property:	Dollars	Dollars	Dollars
Land .....	1,240	1,240	1,240
Improvements .....	400	600	600
Machinery .....	110	110	110
Livestock .....	212	548	767
Total .....	1,962	2,498	2,717
Cash receipts:			
Cotton, lint and seed .....	253	367	501
Sweetpotatoes .....	—	269	400
Butterfat .....	20	—	—
Milk, whole .....	—	280	535
Calves .....	20	79	125
Dairy cow (every other year) .....	—	20	31
Chickens raised .....	—	17	25
Eggs .....	9	90	123
Forest products .....	17	40	40
Total <sup>2/</sup> .....	319	1,162	1,780
Cash expenses:			
Fertilizer and lime .....	52	221	221
Seed .....	15	64	64
Other crop expenses .....	32	72	72
Livestock expenses .....	9	34	36
Feed .....	14	65	110
Machinery hire .....	4	8	8
Building and machinery repair .....	23	27	27
Interest on production credit loan .....	—	7	7
Total .....	149	498	545
Net cash farm income <sup>3/</sup> .....	170	664	1,235
Value of farm products used by family .....	163	188	266
Total farm family income <sup>4/</sup> .....	333	852	1,501
Interest on investment at 5 percent .....	98	125	136
Depreciation .....	40	52	52
Family labor earnings <sup>5/</sup> .....	195	675	1,313
Hours of man labor required per year .....	1,950	3,103	3,103
Family earnings per hour of labor .....	0.10	0.22	0.42

See footnotes table 19, page 24.



Table 21. Suggested organization and financial summary of a medium-size cotton-dairy farm, with comparison, Shortleaf Pine Area of Mississippi.

Item	Farm organization and income <sup>1/</sup>		
	Usual (1941) organization using 1937-41 prices	Suggested reorganization	
		Using 1937-41 prices	Using assumed post-war prices
Land use:	Acres	Acres	Acres
Cropland .....	50	50	50
Open improved pasture .....	7	40	40
Woodland pasture .....	63	—	—
Woodland pasture .....	63	—	—
Total .....	120	120	120
Crops:			
Cotton .....	14	14	14
Corn .....	20	10	10
Oats for grain, hay and pasture .....	4	20	20
Lespedeza for hay and pasture .....	—	(20)	(20)
Cowpeas or soybeans for hay .....	5	—	—
Oats and bur clover for pasture .....	—	5	5
Sorghum for silage .....	—	(6)	(6)
Garden, truck and small fruit .....	1	1	1
Idle .....	6	—	—
Livestock:	Number	Number	Number
Workstock .....	2	2	2
Milk cows .....	15	15	15
Calves for veal .....	5	5	5
Heifers .....	3	3	3
Bull .....	1	1	1
Hogs .....	2	2	2
Hens .....	50	50	50
Chickens raised .....	100	100	100
Value of property:	Dollars	Dollars	Dollars
Land .....	1,955	1,955	1,955
Improvements .....	600	750	750
Machinery .....	200	250	250
Livestock .....	770	1,365	1,600
Total .....	3,525	4,320	4,555
Cash receipts:			
Cotton, lint and seed .....	441	645	876
Milk, whole .....	322	1,013	1,950
Veal calves .....	47	95	126
Dairy cows .....	40	80	124
Chickens raised .....	6	17	25
Eggs .....	33	209	286
Woodland .....	—	40	40
Total <sup>2/</sup> .....	889	2,099	3,427
Cash expenses:			
Fertilizer and lime .....	82	419	419
Seed .....	27	39	39
Other crop expenses .....	34	53	53
Livestock expenses .....	29	29	31
Feed .....	53	127	219
Machinery hire .....	—	114	114
Building and machinery repair .....	30	33	33
Interest .....	—	9	9
Total .....	255	823	917
Net cash farm income <sup>3/</sup> .....	634	1,276	2,510
Value of farm products used by family .....	163	188	266
Total farm family income <sup>4/</sup> .....	797	1,464	2,776
Interest on investment at 5 percent .....	176	216	228
Depreciation .....	72	86	86
Family labor earnings <sup>5/</sup> .....	549	1,162	2,462
Hours of man labor required per year .....	4,095	5,297	5,297
Family earnings per hour of labor .....	0.13	0.22	0.46

See footnotes table 19, page 24.

### Reorganizing a Medium-Size Cotton-Dairy Farm

As on the other reorganized farms an obstacle to making the suggested adjustments on this unit will be the difficulties associated with the establishment of improved pasture, although the amount of woodland that would need to be cleared would not be as great as on the cotton-livestock farm.

It was considered desirable to maintain 14 acres of cotton on this farm. Corn acreage would be cut in half and oats followed by lespedeza would be substituted. Six acres of sorghum would be grown for silage, while oats and bur clover would furnish a temporary pasture during winter and early spring. No changes are suggested in livestock numbers. (Table 21).

The success of the plan for reorganizing the cotton-dairy farm will depend primarily upon the raising of yields, particularly feed grain yields, so that dairy cows may be fed at rates that will result in the economical production of milk. If the suggested plan for reorganization is successful, net cash income could be raised from \$634 to \$1,276, assuming 1937-1941 prices. If assumed post-war prices were effected, it is estimated that net cash farm income could be raised to \$2,510.

The reorganized cotton-dairy farm would utilize the family labor supply fairly effectively during most of the year. (Figure 4). For purposes of illustration, it was assumed that the family labor supply used in figure 4 was furnished by a family consisting of an operator, his wife, one son over 21, one son in high school who would be available for work during 5 months of the year, and one daughter about 12 years of age.

Some cotton-dairy farms with 50 acres of cropland will not have woodland which would be suitable for pasture when cleared. In such cases, part of the cropland could be used for pasture and the farm could be reorganized along the lines suggested for the small cotton farm, which has 30 acres of cropland. Although net cash income would be considerably below the amount indicated when woods can be cleared for pasture, income would be well above that possible with the present organization and usual yields.

### Reorganizing a Medium-Size Cotton-Livestock Farm

The reorganized cotton-livestock farm—which becomes a cotton-beef cattle type when reorganized—represents a type of adjustment that would provide an adequate standard of living for families with as much as 50 acres of cropland. It is believed that many farm operators with the required amount of cropland and enough woodland suitable for conversion to pasture could make these adjustments. The greatest obstacles would be associated with the conversion of 73 acres of woodland to improved pasture. (Table 22).

The livestock organization on this unit would be based on 20 beef cows and three dairy cows, from which 16 beef calves weighing about 400 pounds each would be sold every fall. Cash income would be supplemented by the sale of cotton, surplus milk from 3 dairy cows, and eggs and poultry from a 150-hen flock. The family labor supply of an average size farm family would be adequate to do the farm work required with the reorganized unit.

### Obstacles to Farm Reorganization

A number of the obstacles that would be encountered in making changes suggested for the four representative farms have already been mentioned.



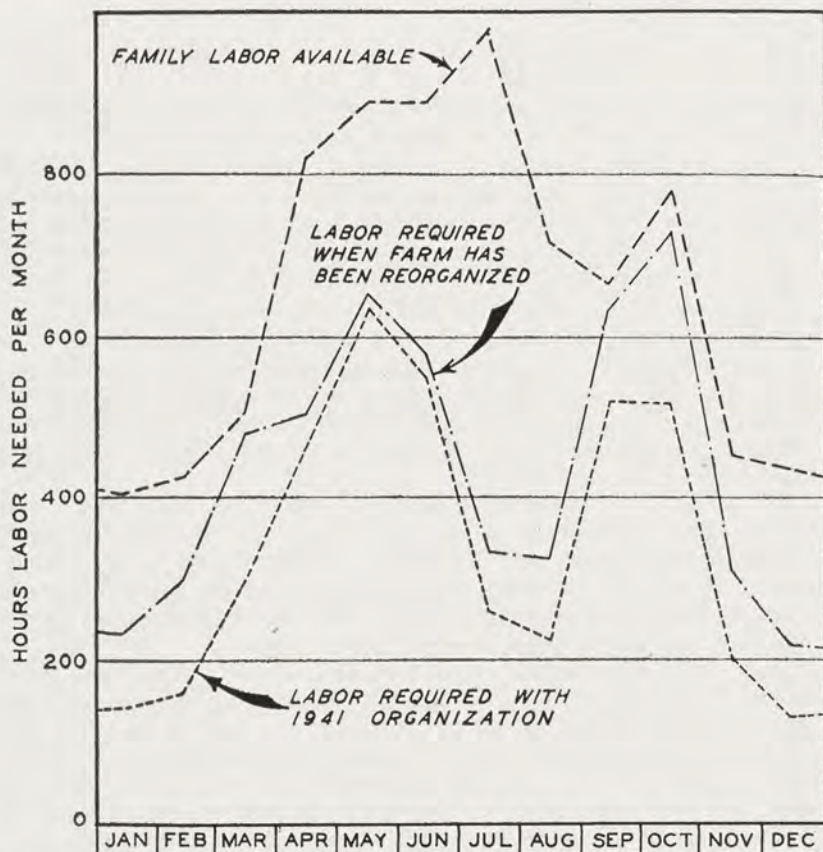


Figure 4. Labor available and required to operate a medium sized (50 acres cropland) cotton-dairy farm before and after reorganization of crop and livestock enterprises and the adoption of improved production practices, Shortleaf Pine Area of Mississippi.

There are many others, a few of which will be discussed below.

If farms already large enough to provide an adequate standard of living for farm families were to remain the same in size and "too small" farms were to be enlarged so that they have 50 acres of cropland (or even 30) it would be necessary to displace a very large number of families, many more than any type of program now visualized could handle. That being the case, the best alternative would seem to be to improve the income on farm units as they now exist, taking full advantage of technological advances, including improved crop and livestock practices and making every effort to conserve the remaining limited soil resources of the Area. If these things are done, agricultural income of the Area would be greatly increased with any reasonable schedule of prices.

Some of the suggested changes could be made in one year's time. Correct fertilization is an example, because that is the most important practice so far as yield increases are concerned. And until yield increases are ob-

Table 22. Suggested organization and financial summary of a medium-size cotton-livestock farm with comparison, Shortleaf Pine Area of Mississippi.

Item	Farm organization and income <sup>1/</sup>		
	Usual (1941) organization using 1937-41 prices	Suggested reorganization	
		Using 1937-41 prices	Using assumed post-war prices
Land use:	Acres	Acres	Acres
Cropland .....	50	50	50
Open improved pasture .....	7	80	80
Woodland pasture and waste .....	183	—	—
Woodland not pasture and waste .....	—	110	110
Total .....	240	240	240
Crops:			
Cotton .....	14	14	14
Corn .....	20	10	10
Oats for grain, hay, and pasture .....	4	20	20
Lespedeza (after oats) for hay and pasture .....	(4)	(20)	(20)
Cowpeas or soybeans for hay .....	5	—	—
Oats and bur clover for pasture .....	—	5	5
Sorghum for pasture .....	—	(5)	(5)
Garden, truck and small fruit .....	1	1	1
Idle .....	6	—	—
Livestock on hand during year:	Number	Number	Number
Workstock .....	2	2	2
Milk cows .....	3	3	3
Beef cows .....	5	20	20
Heifers .....	2	6	6
Bull .....	1	1	1
Beef calves .....	5	17	17
Sow .....	1	—	—
Hogs (other) .....	11	2	2
Hens .....	50	150	150
Chickens raised .....	100	200	200
Value of property:	Dollars	Dollars	Dollars
Land .....	2,625	2,625	2,625
Improvements .....	600	700	700
Machinery .....	200	250	250
Livestock .....	620	1,710	2,035
Total .....	4,045	5,285	5,610
Cash receipts:			
Cotton, lint, and seed .....	441	645	876
Oats .....	—	67	86
Butterfat .....	—	124	239
Cattle .....	144	530	841
Hogs .....	60	—	—
Chickens .....	12	55	78
Eggs .....	33	328	448
Forest products .....	80	160	160
Total <sup>2/</sup> .....	770	1,909	2,728
Cash expenses:			
Fertilizer and lime .....	48	250	250
Seed .....	24	30	30
Other crop expenses .....	34	53	53
Livestock expenses .....	18	43	43
Feed .....	12	122	219
Machinery hire .....	—	42	42
Building and machinery expenses .....	30	33	33
Taxes .....	—	—	—
Interest .....	—	6	6
Total .....	166	579	676
Net cash farm income <sup>3/</sup> .....	504	1,233	1,787
Value of farm products used by family .....	163	188	266
Total farm family income <sup>4/</sup> .....	667	1,421	2,053
Interest on investment at 5 percent .....	202	264	280
Depreciation .....	72	86	86
Family labor earnings <sup>5/</sup> .....	393	1,071	1,687
Hours of man labor required per year .....	3,305	4,213	4,213
Family labor earnings per hour of labor .....	0.12	0.25	0.40

See footnotes table 19, page 24.



tained little real progress can be effected. Pasture establishment, fraught with many difficulties, can be accomplished by close attention to recommendations. Cattle must have a cheap source of roughage if production is to "pay off."

Not all farm operators with farms similar to those reorganized could be expected to make and integrate the changes suggested. Above-average managerial ability would be necessary, although farmers with average or below average ability could make the changes with close supervision, provided they were willing to follow instructions. There is some doubt if credit facilities usually available to farmers in the Area could be expected to provide the needs of a farmer making the changes called for, particularly when it is recalled that many farmers already have mortgages which they are struggling to eliminate. This situation plus the wariness which many operators have of contracting larger indebtedness in the interest of higher future incomes (which in turn are highly dependent on fluctuating prices), makes it extremely difficult to induce farmers to make the more or less radical changes that have been suggested.

In some cases the value of timber would pay for clearing and pasture establishment, but in most cases a special type of intermediate credit—a "transitional" credit—would be absolutely necessary. Credit terms would need to be very liberal, with deferred repayment plans based on the length of time required to get the "new" system of farming on a paying basis. It might be as long as 7 to 8 years before repayments could start, although in many cases repayment could be started within a shorter period. It seems obvious that tenants must have long term leases if they are to make the kind of adjustments suggested.

In order that a small acreage of sweetpotatoes might be grown for out-of-state markets on a substantial number of farms in the Area, additional facilities would be required for curing, storing, and marketing. To be most successful, farms growing sweetpotatoes should be concentrated in rather restricted areas in order that the necessary facilities might be developed and operated most economically. Curing and storing could be accomplished on individual farms or at central locations operated by either individuals or co-operatives. The important point would be to develop such volume as to justify the necessary facilities, and assure a uniform product of high quality.

Educational services concerning the problems of improved farm management must be expanded if small farm operators like those in the Shortleaf Pine Area are to be made to fully understand and appreciate their opportunities. Their lack of understanding concerning the value and paying ability of better management is one of the main reasons improved crop and livestock practices, for example, have not been more generally adopted.



## Summary

The Shortleaf Pine is predominately an area of small cotton farms. Population pressure on the land remains very great, notwithstanding the fact that an estimated one-third of the working force has left the Area during the war. The predominant farming system has resulted in tremendous erosion losses which have been only partially arrested. Conservation needs are great for cropland, pasture, and woodland. Because of poor management practices, many farmers with large acreage of cropland are in as difficult a position as those with smaller acreages.

Possibilities for raising farm incomes through shifts in crop acreages and livestock numbers and the adoption of improved production practices are good. Organizational adjustments would be profitable with any reasonable schedule of post-war prices that might be visualized. Although per acre returns can be substantially increased, the acreage of cropland on some farms is so small that no amount of planning could reasonably be expected to raise farm incomes to an adequate level. Outside employment and an enlargement in farm size represent the only alternatives. Notwithstanding the fact that crop acreages are extremely small on a large proportion of the operating units, improved production practices and acreage shifts would be desirable even though "adequate" incomes might never be obtained. The points listed below will serve to indicate in summary form some of the factors that influence opportunities for improving the status of farm families in the Area.

(1) The soils are inherently poor in fertility, although responsive to fertilizer treatments. Relatively large quantities of fertilizer are needed to make production profitable.

(2) The rural character of the Area is indicated by the fact that 87 percent of the population in 1940 was rural and that 71 percent was rural-farm.

(3) Sixty-one percent of the working force was employed in agricultural pursuits in 1940, compared with 19 percent in the Nation as a whole. Ten percent was employed in manufacturing, compared with 23 percent for the entire United States.

(4) A smaller proportion of the population is colored than in the State as a whole. Only 35 percent of the population was colored in 1940, whereas the figure for the State was 49 percent.

(5) Farm operating units, by most standards, would be considered extremely small. According to an analysis of the 1941 AAA records, 87 percent of the farms had less than 80 acres of cropland, 59 percent had less than 36 acres, and 23 percent had less than 20 acres. In 1940, 42 percent of the farm operators were owners who operated 65 percent of the farm land.

(6) Income from livestock represents only a small proportion of the total farm income. According to the census, income from crops accounted for 71 percent of the value of farm products sold or traded. Livestock accounted for 26 percent and forest products for 3 percent.

(7) Farm incomes have been extremely low. According to the 1939 census, 62 percent of all farms averaged less than \$400 in farm products sold, traded, or used. Thirty-two percent of the farms averaged less than \$250 worth of farm products sold, traded, or used.

(8) The pressure of population on land is indicated by the fact that in 1943 there were only 6.6 acres of cropland per rural resident. These data



were secured from a compilation of sugar ration books. Of this acreage, 1.5 acres were in cotton and 2.7 in corn. According to an analysis of a 20 percent sample of AAA records in 1941, the average farm family had at its disposal only 29 acres of cropland. Families operating strictly cotton-type farms had available only 25 acres, part of which was idle. The acreage of cropland available per family on multiple-family farms was usually no larger than on the one-family farms. In many cases it was smaller.

(9) Fifty-one percent of all farms in the Area were classified as cotton-type farms. Although livestock was of greater importance on other types of farms, cotton was an important source of income on practically all farms. In 1939, 27 percent of the cropland was in cotton, 43 percent in corn, and 9 percent in tame hay.

(10) Opportunities for increasing crop yields are good. Crop specialists have indicated that the average yield of cotton could be raised 46 percent. Corn yields could be raised almost 100 percent. Livestock production rates could also be increased greatly through better practices. It has been estimated that egg production per hen could be doubled and that milk production per cow could be raised 90 percent.

(11) The use of increased quantities of fertilizer represents the improved practice of greatest importance so far as yield increases are concerned. Eighty-one percent of the 208 "representative" farm operators from whom detailed practice data were obtained used fertilizer on cotton, but only 4 percent fertilized at recommended rates in 1941. Use of fertilizer on cotton has increased during the war, but there is still much room for improvement. Although 31 percent of the farmers interviewed applied fertilizer on corn in 1941, less than 3 percent applied the recommended amount. Most farmers applied 50 to 100 pounds of nitrate of soda, whereas recommendations specify 200 pounds of nitrate of soda or its equivalent.

(12) Through farm reorganization and the adoption of improved practices, net cash farm income on a small cotton farm (30 acres of cropland) could be raised from \$170 to \$664, assuming the same prices. If assumed post-war prices were obtained the level of income would reach \$1,235. Proportionate increases could be obtained through reorganization of representative farms in other important size-type groups.

## APPENDIX

Table 1. Prices used in computing financial summaries of representative farms, Shortleaf Pine Area of Mississippi.

	1937-41 average	Post-war assumed
	Dollars	Dollars
Prices received:		
Cotton lint, lb. ....	0.109	0.14
Cottonseed, ton .....	27.49	47.25
Corn, bu. ....	0.66	1.04
Oats, bu. ....	0.45	0.58
Sweetpotatoes, bu. ....	0.84	1.25
Milk, less hauling, cwt. ....	1.57	2.83
Butterfat, lb. ....	0.27	0.52
Eggs, doz. ....	0.19	0.26
Beef cattle, cwt. ....	4.94	7.79
Veal, calves, cwt. ....	6.76	9.00
Hogs, cwt. ....	6.40	9.34
Chickens .....	0.14	0.20
Prices paid:		
Cottonseed meal, ton .....	27.49	47.25
Corn, feed, bu. ....	0.66	1.04
Corn seed, bu. ....	1.00	5.00
Cottonseed, bu. ....	1.00	3.00
Oats, bu. ....	0.45	0.58
Mixed fertilizer, tons:		
6-8-4 .....	29.83	29.83
5-10-5 .....	29.92	29.92
0-14-7 .....	24.22	24.22
Ammonium nitrate, ton .....	51.00	51.00
Superphosphate, 20 percent, ton .....	20.40	20.40
Muriate of potash, ton .....	39.48	39.48
Lime, ton .....	4.00	4.00
Mowing, hired, acre .....	1.00	1.00
Machinery expense, per crop acre .....	0.50	0.50
Cotton ginning, bagging and ties, per lb. lint .....	0.01	0.01
Combining oats, acre .....	3.00	3.00
Sweetpotato containers, bu. ....	—	0.10
Depreciation of mules .....	8.00	8.00
Depreciation of improvements per \$100 of original cost .....	3.60	3.00



## APPENDIX

Table 2. Man labor and power required per crop acre and per unit of livestock with normal and increased yields, Shortleaf Pine Area of Mississippi.

Item	Total hours		Distribution of man hours by months											
	Man	Mule	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Crops:														
Cotton with normal yield	114.0	41.2	0.6	0.6	2.8	11.8	17.5	15.2	8.8	6.6	26.6	20.7	2.8	=
Cotton with improved yield	135.0	42.0	0.6	0.6	2.8	11.8	17.5	15.2	8.8	6.7	33.0	31.0	7.0	=
Corn with normal yield	34.4	34.7	=	0.5	5.0	6.2	8.4	8.1	1.2	=	=	3.5	1.5	=
Corn with improved yield	40.0	36.0	=	0.5	5.0	6.2	8.4	8.1	1.2	=	=	7.0	3.6	=
Cowpea hay	23.8	34.0	=	1.6	2.4	2.3	4.0	3.5	=	5.0	5.0	=	=	=
Lespedeza hay	14.6	22.0	=	2.0	4.2	=	=	=	=	2.2	6.2	=	=	=
Oats for hay	18.0	26.0	=	=	1.5	=	9.0	=	=	=	=	4.5	3.0	=
Oats for grain	10.5	18.0	=	=	=	=	3.0	=	=	=	=	4.5	3.0	=
Summer pasture	7.4	14.0	=	=	1.6	2.8	3.0	=	=	=	=	=	=	=
Winter pasture	4.0	8.0	=	=	=	=	=	=	=	2.0	2.0	=	=	=
Sorghum for silage	60.3	27.5	=	=	1.6	2.8	5.5	3.1	0.5	13.3	33.5	=	=	=
Sweetpotatoes	100.0	55.0	=	1.5	6.5	7.5	27.0	20.5	=	=	=	37.0	=	=
Livestock:														
Workstock	60.0	=	5.0	5.2	5.6	6.4	6.4	6.4	3.8	3.8	4.2	4.5	4.0	4.7
Milk cows	112.0	=	10.0	10.0	10.0	10.0	10.0	10.0	8.0	8.0	8.0	8.0	10.0	10.0
Beef cows	28.0	=	4.0	4.0	3.0	1.5	1.5	1.5	1.5	1.5	1.5	2.5	2.0	3.5
Other cattle	14.0	=	2.0	2.0	1.5	0.8	0.8	0.8	0.8	0.8	0.8	1.2	1.0	1.5
Sow and litters	78.0	=	6.0	6.0	8.0	8.0	7.0	6.0	5.0	5.0	6.0	8.0	7.0	6.0
Other hogs	16.5	=	1.5	1.5	1.5	1.5	1.5	1.3	1.0	1.0	1.3	1.6	1.5	1.3
Hens (50 per flock)	240.0	=	16.0	17.0	20.0	32.0	32.0	30.0	20.0	15.0	15.0	14.0	14.0	15.0

## APPENDIX

Table 3. Usual seeding rates for important crops, Shortleaf Pine Area of Mississippi.

Crop	Unit	Usual seeding rate <sup>1/</sup>
Corn	Pound	8.0
Oats	Bushel	2.0
Cotton	Bushel	1.0
Peanuts	Pound	45.0
Soybeans for hay	Pound	60.0
Cowpeas for hay	Pound	48.0
Sweetpotatoes	Bushel	8.0
Lespedeza	Pound	25.0
Kudzu	Crown	500.0

<sup>1/</sup>The recommended seeding rate is higher for most crops.