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D. W. Parvin

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**Farm Practices and Organization
In the Southern Sand-Clay
Hills of Mississippi**

By

D. W. PARVIN

MISSISSIPPI STATE COLLEGE
AGRICULTURAL EXPERIMENT STATION
FRANK J. WELCH, Director

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FARM PRACTICES AND ORGANIZATION IN THE SOUTHERN SAND-CLAY HILLS OF MISSISSIPPI

By D. W. PARVIN

Efficient farm practices and farm organization are important considerations in all types of farming areas; however, they should be given special consideration in the southern part of the Sand-Clay Hills, because of the small size of the majority of operating farm units. All farm resources in this area, as represented by Newton County, must be used as efficiently as possible if farm income per farm family is to compare favorably with that of other sections of the country where a larger land area is available per family. Operators of small farms must invest more capital per acre in the form of fertilizer, seed, equipment, buildings, livestock, feed, etc., and in general follow a more scientific and intensive system of farming than operators of larger units if they are to have comparable incomes.

The primary purpose of this study is to bring together available information relating to the agriculture of this area and to demonstrate insofar as possible its application in improving farm production and income. More specifically, the following objectives were set up to guide the course of study.

1. To provide a general description of the area and its resources.
2. To determine present farm practices and the relationship of variations in these practices to production.
3. To determine labor and power requirements for major farm operations with different types of power.
4. To bring together in one publication available information on improved farming practices for the major crop and livestock enterprises adapted to this area.
5. To determine the present farm organization for each of the major size groups.

6. To indicate the extent to which farm income could be increased for individual farms typical of each size group through better farm organization and improved farm practices.

Method of Study

Newton County was selected for study as being fairly representative of conditions in the southern part of the Sand-Clay Hills. See figure 1. There are two soil areas in Newton County—the Central Prairie and the Sand-Clay Hills. The field study was limited to the latter area, which makes up about 90 percent of the county.

In collecting information in the field the following schedules were used: (1) A crop enterprise schedule to record crop practices and production per acre for the major crops; (2) A labor and mule power requirement schedule to record the time required to perform standard operations on farms using mule power; (3) A labor and tractor power requirement schedule to record the time required to perform standard operations on farms using tractor power; (4) A livestock enterprise schedule to record livestock practices and production for the major livestock enterprises; and (5) A farm organization schedule to record the present organization, production and cost items used in production for farms in each major size group.

In selecting the sample for field study, five independent samples were drawn in order to hold individual interviews within a reasonable time limit. A few farmers were drawn in two separate samples; none appeared in over two samples. The samples were selected in the following manner:

1. Crop enterprise schedule. The individual farm cards in the PMA office were arranged according to size and a 4 percent sample drawn by selecting each

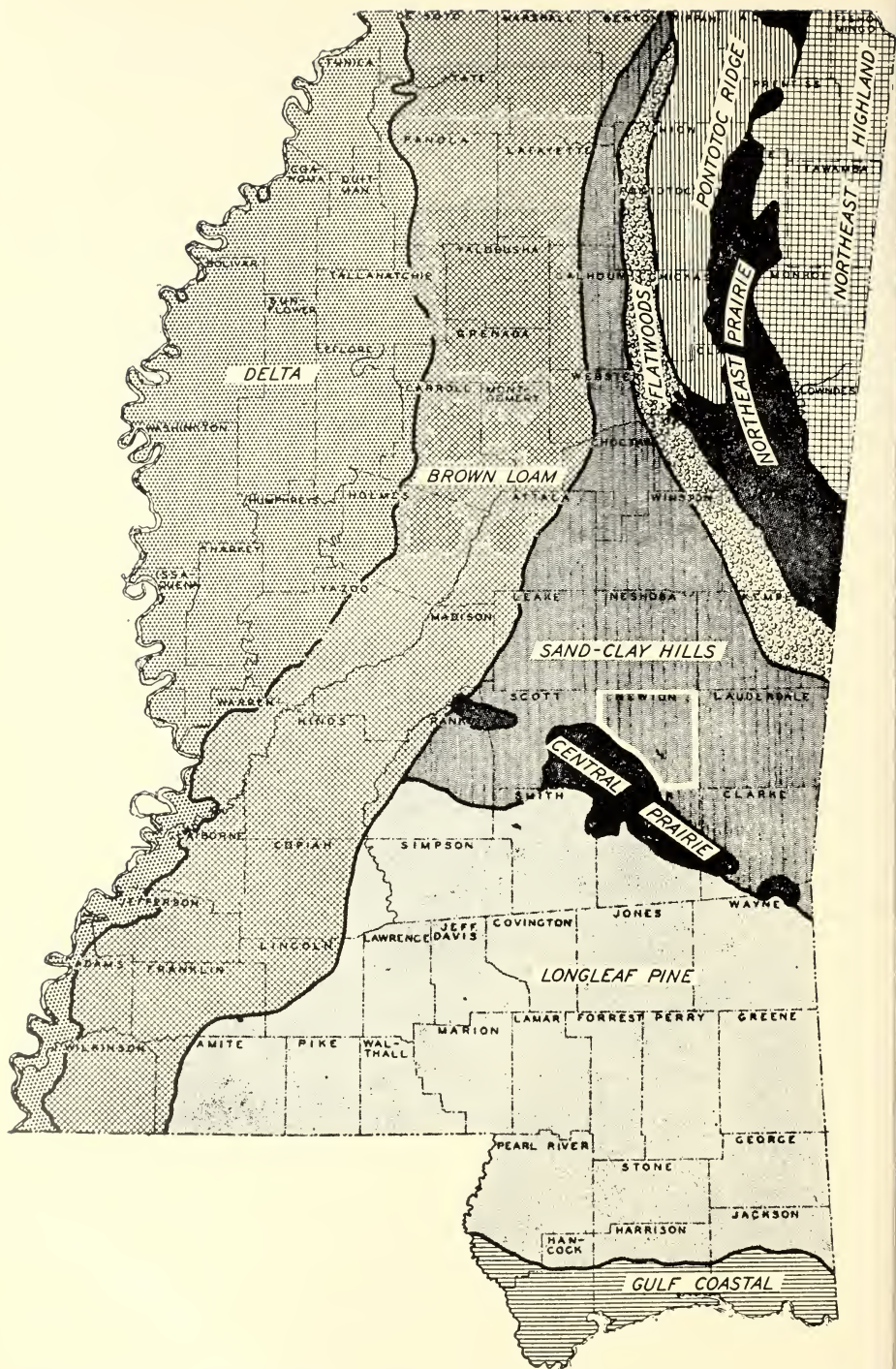


Figure 1. Newton County, outlined in white on the above map, was the location of the economic study reported in this publication.

twenty-fifth farm. Farms having less than 10 acres were eliminated before the sample was drawn because most of the farms in this group would probably be classified as part-time or semi-retirement farms.

2. Labor and tractor power requirements schedule. A list of farmers in the county having tractors was made up from the file of farmers receiving gasoline for tractors during the rationing period and from information furnished by county agricultural workers. It was recognized that this was an incomplete list, but it was felt that more than half of the farmers owning tractors were included. This list when completed contained the names of 130 farmers. A twenty-five percent sample was drawn from the list after the farms had been arranged according to size by selecting each fourth farm.

3. Labor and mule power requirement schedule. This sample was drawn in the same manner as the crop enterprise sample except that the farms known to have tractors were eliminated from the group and only a 2 percent sample was taken.

4. Livestock enterprise schedule. A complete list of Newton County farmers selling dairy products was obtained from processing and fluid milk plant records. The farms were arranged according to the amount of milk sold and a twenty-five percent sample drawn by selecting each fourth farm. The study of livestock enterprises was limited to dairy farms because dairying is by far the most important livestock enterprise in the county.

5. A ten percent sample of the 1943 PMA worksheets, which gave total land in farms, was arranged according to acres of farm land. The farms tended to concentrate around 40, 60, 80, 120, 160, 240 and 360 acres and it was decided to limit the farm organization study to these 7 size groups. All PMA worksheets in the county office showing 40,

60, 80, 120, 160, 240, or 360 acres of farm land were taken from the files and a random sample of 10 farms was taken from each size group. For the 240 and 360 acre size groups it was necessary to include farms having slightly more or less land than the specified acreage in order to have enough farms from which to draw the sample.

When it was necessary to drop a farm from any of the original five samples for any reason, it was replaced by a farm in the same community which had the same characteristics.

The total numbers of usable schedules obtained were as follows: Crop enterprise, 170; labor and mule power requirements, 31; labor and tractor power requirements, 28; livestock enterprise, 43; and farm organization, 66. A larger number of schedules was taken in each instance but a number had to be discarded because of incompleteness or other reasons.

Data related to the general characteristics of the area were taken from the United States Census and publications of the United States Department of Agriculture.

Physical Resources

From 1936 to 1946 the frost-free seasons in Newton County ranged from 184 days in 1943 to 255 days in 1946, and averaged 222 days. The last killing frost in the spring occurs in March or April and the first killing frost in the fall in October or November. The normal annual rainfall is 58.7 inches. The falls are usually dry and there are frequent late summer droughts.¹

Newton County lies in the central part of the Coastal Plain physiographic soil division. The soils in the county developed from two widely different geologic formations. About 90 percent of the county is comprised of soils that develop-

¹Weather Bureau, United States Department of Agriculture, 1936-1946.

ed from Coastal Plains sands, sandy clays, and heavy clays. The other 10 percent is comprised of soils that developed from soft limestone, marls, and extremely plastic clays over limestone. The county is in the form of a square, and a small portion in the Southwest corner of the county lies in the Central Prairie soil area, and the remainder lies in the Sand-Clay Hill soil area.

Soils of the Sand-Clay Hills. The geological materials found in this area in Newton County are sand, sandy clays, and heavy clays which occur in various proportions. In some places sandy parent materials predominate, and in other areas the heavy materials predominate. Naturally light-textured soils developed from the sandy materials, and clay soils developed from the heavy parent material.

The predominating soils that developed from the light-textured parent material are as follows: (1) Hill soils—Orangeburg, Ruston, Faceville, Ora, Savannah; (2) Terrace or Bench Soils—Cahaba, Tilden, Kalmia, Prentiss, Stough, Myatt; (3) Bottom Soils—Ocklocknee, Iuka, Mantachie, Bibb; (4) Colluvial Soils—Ducker, Jamison, Guntown.

The predominating soils that developed from the heavy sandy clays and clay are as follows: (1) Upland Soils—Boswell, Sawyer, Susquehannah, Shubuta, Cuthbert; (2) Terrace Soils—Flint, Izagora, Leaf, Byars; (3) Bottom Soils—Urbo, Chastain.

The Sand-Clay Hills Soil Area is adapted to a general type of farming. In this section cotton and corn, along with some hay and fruits, have been the main cash crops in the past. At present, however, many farmers have developed good pastures on their small farms and have gone into the dairy business. At the present time the farmers in this section of the county are getting their farm income from three main sources. These are cotton, dairy products, and timber. This combination of enterprises seems to work very nicely, and many farmers have en-

joyed relatively high farm incomes since they shifted from a strict cotton economy to more diversification. Much of the land in this section is rough and severely eroded and is suitable only for the production of perennial crops like kudzu and trees.²

Population

The density of population in Newton County of 42 persons per square mile is slightly higher than for the Shortleaf Pine Area as a whole and slightly lower than for the State (table 1). Total population in Newton County increased 23 percent from 1900 to 1940. This increase was considerably less than for other parts of the State. The farm population in Newton County decreased 29 percent from 1940 to 1945 which was a slightly higher decrease than took place in the Shortleaf Pine Area and the State (table 2). In 1940, 65 percent of the people in this county were white. This was the same percentage that was reported for the Shortleaf Pine Area, but it was considerably higher than that reported for the State as a whole. The total population of Newton County was classified as rural in 1940 as contrasted to 87 percent rural for the Shortleaf Pine Area and 80 percent rural for the State. Seventy-four percent of the population in this county was classified as rural-farm which was slightly higher than for the Shortleaf Pine Area and considerably higher than for the State.

Industrial Development

Newton County is predominately agricultural, and there has been relatively little industrial development. In 1940, 67.4 percent of the people employed in Newton County were engaged in agriculture, as compared to 60.8 for the Shortleaf Pine Area, 57.7 percent for Mississippi, 31.5 percent for the South, and 18.5 percent for the United States (table 3).

²Five preceding paragraphs prepared by H. B. Vanderford, Associate Professor of Soils, Mississippi State College.

Table 1. Total population: Composition and trends, Newton County, Mississippi, 1900-1940, with comparisons.

| Item | Newton County | Shortleaf Pine Area | Mississippi |
|--|------------------|------------------------|-------------|
| Percent increase from 1900 to 1940: | | | |
| Total population | 23 | 28 | 41 |
| White population | 33 | 39 | 73 |
| Negro population | 11 | 12 | 18 |
| Rural population | 23 | 17 | 22 |
| Urban population ¹ | 0 | 268 | 261 |
| Percent of 1940 population that was: | | | |
| White | 65 | 65 | 51 |
| Negro | 35 | 35 | 49 |
| Rural | 100 | 87 | 80 |
| Rural-farm | 74 | 71 | 64 |
| Rural-nonfarm | 26 | 16 | 16 |
| Population per square mile (640 acres) | 42 | 40 | 46 |

Source: U. S. Census.

¹All persons living in incorporated places of 2500 or more. There were no incorporated places of 2500 or more in Newton County in 1900 or 1940.

Table 2. Farm population, Newton County, 1940-1945, with comparisons.

| Area | 1940 | 1945 | Percent decrease |
|---------------------------|-----------|-----------|------------------|
| Newton County | 17,910 | 12,761 | 29 |
| Shortleaf Pine Area | 340,600 | 252,950 | 26 |
| Mississippi | 1,403,142 | 1,050,444 | 25 |

Source: U. S. Census. The data for 1940 and 1945 are not 100 percent comparable because of different methods used in taking the two censuses; however, it can be used to give an approximation of the change in farm population from 1940 to 1945.

Table 3. Occupation of employed persons, Newton County, Mississippi, 1940, with comparisons.¹

| Item | Newton County | Shortleaf Pine Area | Mississippi | South ² | United States |
|--|------------------|------------------------|-------------|--------------------|------------------|
| Percent of total | | | | | |
| Employed in agriculture | 67.4 | 60.8 | 57.7 | 31.5 | 18.5 |
| Manufacturing | 7.5 | 10.0 | 9.2 | 15.9 | 23.4 |
| Manufacturing (excluding sawmills, planing mills and logging) | 2.1 | 4.0 | 5.3 | 13.5 | 22.1 |
| Service trades ³ | 22.3 | 24.9 | 28.2 | 43.9 | 49.8 |
| Other occupations ⁴ | 2.1 | 3.1 | 3.9 | 7.6 | 6.8 |
| Not reporting occupation | .7 | 1.2 | 1.0 | 1.1 | 1.5 |

Sources: United States Census.

¹Does not include employment on public emergency work.

²The "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.

³Includes transportation, communications, 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.

⁴Includes construction, mining, fishing, and forestry (excluding logging).

In 1940, only 2.1 percent of all employed persons in Newton County were engaged in manufacturing, exclusive of sawmills, planing mills and logging, as compared to 4 percent for the Shortleaf Pine Area, 5.3 percent for Mississippi, 13.5 percent for the South and 22.1 percent for the United States. Service trades accounted for 22.3 percent of the people employed in Newton County in 1940, which is a slightly smaller proportion than for other parts of the State and less than half of that of the United States.

Marketing and Processing Facilities and Services

Marketing and processing facilities for handling the cotton crop are adequate. There are 11 gins and 2 warehouses in Newton County. One of the warehouses is equipped with a compress. In addition there is one cotton oil mill in the county and one in an adjoining county.

There are a number of assembling and processing plants for dairy products in Newton and adjacent counties. Within the county there is a cheese plant, creamery, a milk cooling station for Grade A milk and an ice cream plant. Routes from a milk cooling station for manufacturing milk and from two fluid milk distributing plants extend into the county. However, there are many individual farmers who are not on or near cream or milk routes and who must furnish their own transportation if they are to sell dairy products. Transportation cost

including the labor required to move dairy products to market is prohibitive and prevents many potential producers from going into the dairy business. Some of the old routes could be extended and some new ones started where present or potential production would justify it.

There are two livestock auction markets in Newton County and several in bordering counties, including two large auctions in Lauderdale County. There is one packing plant located in Lauderdale County, and there are several local butchers in Newton and nearby counties. These, plus a number of local buyers, provide physical facilities sufficient to handle the livestock production of Newton County.

There are several sawmills in the county and a large pulpwood plant in Lauderdale County. These furnish a ready market for timber products; however, many farmers need to be better informed as to the volume and value of the timber they have for sale.

A market for broilers has been developed at Union which is located on the county line between Newton and Neshoba Counties. In other parts of the county markets for poultry products have not been developed except for local dealers who usually operate a general merchandising business or a grocery store.

Adequate market facilities for other farm commodities produced in Newton County have not been developed.

TRENDS IN FARM ORGANIZATION AND MANAGEMENT

Land Use

A higher percentage of the land in Newton County is in farms than in the Shortleaf Pine Area or in the State. In 1944, 75 percent of the total land area in Newton County was in farms as compared to 69 percent in the Shortleaf Pine Area and 65 percent in the State (table

4). Thirty-four percent of the land in farms in Newton County was classified as cropland in 1944, which was one percent higher than 15 years before. The proportion of farm land that was classified as cropland decreased 3 percent in the Shortleaf Pine Area and 5 percent in the State during this same 15 year period.

Table 4. Land use in Newton County, Mississippi, 1929, 1939 and 1944, with comparisons.

| Item | Newton County | | | Shortleaf Pine Area | | | Mississippi | | |
|---|----------------------------|-----------------|------|---------------------|-----------------|------|-------------|-----------------|------|
| | 1929 | 1939 | 1944 | 1929 | 1939 | 1944 | 1929 | 1939 | 1944 |
| | Percent of total farm land | | | | | | | | |
| Total cropland | 33 | 37 | 34 | 34 | 35 | 31 | 43 | 42 | 38 |
| Cropland harvested | 29 | 33 | 26 | 30 | 28 | 26 | 38 | 36 | 33 |
| Open pasture | 17 | .. ² | 19 | 16 | .. ² | 23 | 15 | .. ² | 22 |
| Woodland pasture | 23 | .. ² | 22 | 18 | .. ² | 19 | 16 | .. ² | 18 |
| Woodland | 24 | .. ² | 22 | 23 | .. ² | 22 | 19 | .. ² | 17 |
| Other | 3 | .. ² | 2 | 8 | .. ² | 5 | 7 | .. ² | 5 |
| Total land in farms ¹ | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Total land area in farms, percent | 74 | 74 | 75 | 66 | 68 | 69 | 58 | 63 | 65 |

Source: U. S. Census.

¹The totals for the columns will not necessarily add to 100 because of rounding.

²Not available.

The proportion of the land in farms that was devoted to open pasture in Newton County increased from 1929 to 1944 but the increase was less than that which took place in the Shortleaf Pine Area and in the State. In 1944, 19 percent of the land in farms in Newton County was used for open pasture as compared to 23 percent for the Shortleaf Pine Area and 22 percent for the State.

Significant changes took place in the use of cropland in Newton County between 1929 and 1944. The proportion of cropland devoted to cotton decreased from 53 percent to 23 percent; the proportion in corn increased from 37 percent to 51 percent; the proportion in hay increased from 4 to 15 percent; and the proportion in oats increased from 1 percent to 7 percent (table 5). Similiar shifts took place in the Shortleaf Pine Area, and in the State, although the changes were

not as pronounced. In 1944, Newton County farmers devoted a greater proportion of their cropland to corn, hay, and oats, and a smaller proportion to cotton, than did farmers in the Shortleaf Pine Area or the State as a whole.

The primary reason for the greater shift from cotton to feed crops in Newton County than in the Shortleaf Pine Area or in the State as a whole is shown in table 6. In Newton County the yield of cotton per acre increased 31 percent from the average for the five-year period 1928-1932 to the average for the five-year period 1943-47, as contrasted to a 61 percent increase in the Shortleaf Pine Area and a 73 percent increase for the State during the same period. Between 1928 and 1932 the yield of cotton per acre in Newton County was 11 percent above that in the Shortleaf Pine Area and only 1 pound below that of the State as a whole;

Table 5. Crops harvested in Newton County, Mississippi, 1929, 1939 and 1944, with comparisons.

| Item | Newton County | | | Shortleaf Pine Area | | | Mississippi | | |
|-------------------------------------|-------------------------------------|------|------|---------------------|------|------|-------------|------|------|
| | 1929 | 1939 | 1944 | 1929 | 1939 | 1944 | 1929 | 1939 | 1944 |
| | Percent of total cropland harvested | | | | | | | | |
| Corn | 37 | 54 | 51 | 40 | 48 | 49 | 30 | 43 | 37 |
| Cotton | 53 | 30 | 23 | 50 | 30 | 30 | 61 | 35 | 35 |
| All hay | 4 | 11 | 15 | 5 | 13 | 14 | 5 | 12 | 14 |
| All oats | 1 | 2 | 7 | .. ² | 1 | 2 | 1 | 2 | 7 |
| Total ¹ | 95 | 97 | 96 | 95 | 92 | 95 | 97 | 92 | 93 |
| Cropland harvested 1929 = 100 | 100 | 117 | 92 | 100 | 99 | 92 | 100 | 105 | 98 |

Source: U. S. Census.

¹This does not necessarily constitute the percent that these four crops contribute to total cropland harvester because of double-cropping of oats and hay on same land.

²Less than .5 percent.

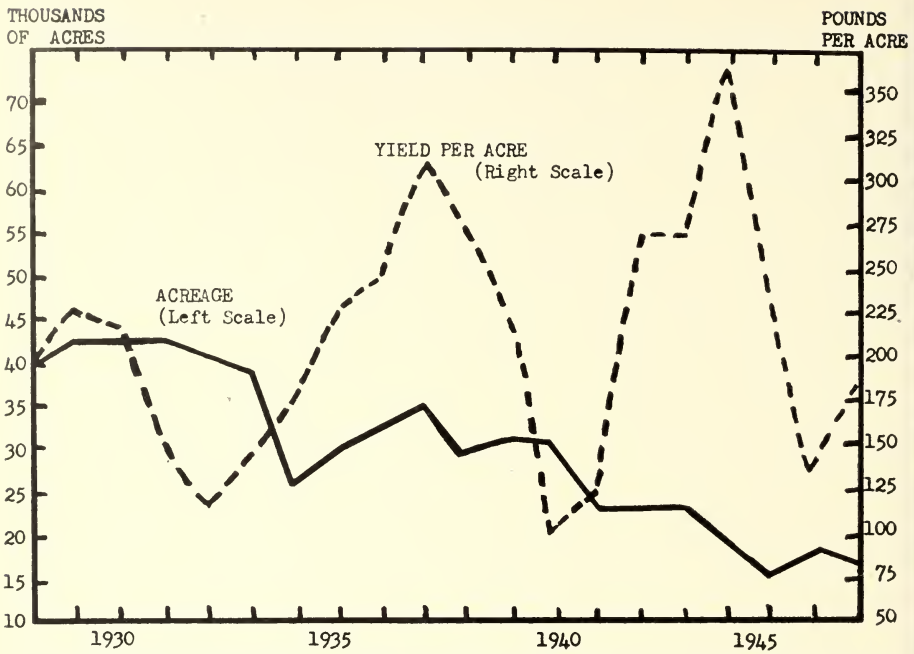


Figure 2. Acreage, yield and production of cotton in Newton County, Mississippi, 1928-1947.

however, between 1943 and 1947 the yield of cotton per acre in Newton County was 10 percent below that in the Shortleaf Pine area and 25 percent below that in the State as a whole. In other words Newton County farmers have not been able to increase their per acre yield of cotton as much as have farmers in the Shortleaf Pine Area and in the State as a whole, and have therefore found it more profitable to utilize a greater proportion of the land in the production of feed crops and livestock enterprises.

In addition to low average yield, extreme fluctuations in yield from year to year have contributed to the decreased acreage of cotton in Newton County. For example, the average per acre yield of cotton in Newton County was 259 percent higher in 1944 than in 1940, and 63 percent lower in 1946 than in 1944 (figure 2). A further observation of figure 2 will show the extent to which the acre-

age and production of cotton in Newton County have declined during the past two decades.

An observation of table 7 will show the extent to which livestock production has increased in Newton County and other parts of the state. The commercial production of dairy and poultry products are relatively more important in Newton County than in the Shortleaf Pine Area or in the State. In 1944, dairy products valued at \$114 and poultry products valued at \$68 were sold per 100 acres of farm land in Newton County; for the Shortleaf Pine Area comparable figures were \$75 for dairy products and \$51 for poultry products, and for the State \$90 for dairy products and \$45 for poultry products. In all, Newton County farmers received 30 percent of their cash farm income from the sale of livestock and livestock

Table 6. Trends in cotton acreage, production and yield, Newton County, Mississippi, 1928-1947, with comparisons.

| Item | Newton County | | | Shortleaf Pine Area | | | Mississippi | | |
|---------------------------------|---------------|---------|----------------|---------------------|---------|----------------|-------------|-----------|----------------|
| | 1928-32 | 1943-47 | Percent change | 1928-32 | 1943-47 | Percent change | 1928-32 | 1943-47 | Percent change |
| 1928-32 average: | | | | | | | | | |
| Acres | 41,820 | 19,060 | -54 | 738,820 | 427,336 | -42 | 4,018,200 | 2,378,800 | -41 |
| Production, 500 lb. bales | 16,098 | 9,593 | -40 | 256,608 | 239,417 | -7 | 1,559,000 | 1,590,800 | +2 |
| Yield, lbs. | 184 | 241 | +31 | 166 | 268 | +61 | 185 | 320 | +73 |
| 1943-47 average: | | | | | | | | | |
| Acres | | | | | | | | | |
| Production, 500 lb. bales | | | | | | | | | |
| Yield, lbs. | | | | | | | | | |
| Percent change: | | | | | | | | | |
| Acres | | | | | | | | | |
| Production, 500 lb. bales | | | | | | | | | |
| Yield, lbs. | | | | | | | | | |

Source: Office of the Agricultural Statistician, Bureau of Agricultural Economics.

products as compared to 22 percent in the Shortleaf Pine Area and 16 percent for the State.³

Size of Farms

With present systems and methods of farming the majority of farms in Newton County are too small to utilize modern equipment efficiently and to employ labor throughout the year. In 1944, less than 30 acres of cropland were harvested on 64 percent of the operating farm

units⁴ and less than 50 acres of cropland were harvested on 86 percent of the operating farm units (table 8). Operating farm units in the Shortleaf Pine Area and in the State fall into about the same size pattern.

When the operating farm units in Newton County are distributed according to total land in farms about one-

⁴Operating farm unit refers to ownership or management unit, which may include several farm families.

³See table 13.

Table 7. Livestock numbers per 100 acres of farm land, Newton County, Mississippi, 1930, 1940 and 1945, with comparisons.

| | Newton County | | | Shortleaf Pine Area | | | Mississippi | | |
|--|---------------|------|------|---------------------|------|------|-------------|------|------|
| | 1930 | 1940 | 1945 | 1930 | 1940 | 1945 | 1930 | 1940 | 1945 |
| On farms January 1: | | | | | | | | | |
| Horses and mules | 2.2 | 2.3 | 2.1 | 2.3 | 2.3 | 2.3 | 2.7 | 2.3 | 2.3 |
| Cattle and calves, all | 4.9 | 5.9 | 7.8 | 4.5 | 5.1 | 7.3 | 4.9 | 5.9 | 8.4 |
| Cows and heifers, 2 yrs.+ | 3.0 | 3.2 | 4.6 | 2.7 | 3.0 | 4.1 | 2.9 | 3.4 | 5.0 |
| Hogs and pigs | 1.4 | 2.6 | 3.1 | 1.9 | 2.8 | 3.2 | 2.8 | 4.3 | 4.7 |
| Sows for spring farrowing | .2 | .3 | .4 | .2 | .2 | .3 | .4 | .5 | .6 |
| Chickens on hand | 28 | 32 | 40 | 29 | 29 | 39 | 31 | 32 | 38 |
| During year:¹ | | | | | | | | | |
| Chickens raised ² | 59 | 64 | 63 | 59 | 79 | 74 | 62 | 59 | 75 |
| Cows and heifers milked ³ | 2.4 | 2.6 | 2.7 | 2.4 | 2.4 | 2.5 | 2.2 | 2.4 | 2.4 |
| Cattle and calves sold | .4 | 1.2 | 1.9 | .4 | 1.3 | 1.8 | .4 | 1.3 | 1.9 |
| Hogs and pigs sold | .4 | .4 | 1.1 | .4 | .9 | 1.5 | .4 | 1.0 | 1.7 |

Source: U. S. Census.

¹1929, 1939 and 1944.

²In 1944 the value of poultry products sold per 100 acres of farm land was \$68 in Newton County, \$51 in the Shortleaf Pine Area, and \$45 in Mississippi.

³In 1944 the value of dairy products sold per 100 acres of farm land was \$114 in Newton County, \$75 in the Shortleaf Pine Area and \$90 in Mississippi.

⁴Not available.

Table 8. Percentage distribution of operating farm units¹ by acres of cropland harvested, Newton County, Mississippi, 1944, with comparisons.

| Acres of cropland harvested | Percent of operating farm units | | | Cumulative percent | | |
|-----------------------------|---------------------------------|---------------------|-------------|--------------------|---------------------|-------------|
| | Newton County | Shortleaf Pine Area | Mississippi | Newton County | Shortleaf Pine Area | Mississippi |
| 1 - 9 | 12.9 | 13.2 | 14.6 | ---- | ---- | ---- |
| 20 - 29 | 24.3 | 25.3 | 23.0 | 64.1 | 65.4 | 62.5 |
| 30 - 49 | 21.2 | 21.8 | 20.3 | 85.9 | 86.6 | 82.8 |
| 50 - 99 | 11.1 | 10.7 | 10.5 | 96.6 | 97.7 | 93.3 |
| 100 - 199 | 2.0 | 2.7 | 3.7 | 99.7 | 99.3 | 97.0 |
| 10 - 19 | 28.2 | 25.6 | 24.9 | 38.8 | 41.1 | 39.5 |
| 200 and over | .3 | .7 | 3.0 | 100.0 | 100.0 | 100.0 |
| Total | 100.0 | 100.0 | 100.0 | ---- | ---- | ---- |

Source: U. S. Census.

¹A complete farm business. It may consist of a multiple unit (two or more families) under the supervision of one operator, or a single unit (one family) under the management of the family farming it.

Table 9. Percentage distribution of operating farm units, land in farms and cropland harvested by size groups, Newton County, Mississippi, 1944.

| Acres of land | Percent of total | | | Cumulative percent | | | Percent of land from which crops were harvested |
|----------------------|----------------------|---------------|--------------------|----------------------|---------------|--------------------|---|
| | Operating farm units | Land in farms | Cropland harvested | Operating farm units | Land in farms | Cropland harvested | |
| Under 10 | 2.9 | .2 | .3 | ---- | ---- | ---- | 51 |
| 10 - 29 | 9.6 | 1.7 | 3.6 | 12.5 | 1.9 | 3.9 | 55 |
| 30 - 49 | 18.8 | 7.0 | 10.5 | 31.3 | 8.9 | 14.4 | 39 |
| 50 - 69 | 11.5 | 6.3 | 8.4 | 42.8 | 15.2 | 22.8 | 35 |
| 70 - 99 | 19.8 | 14.8 | 17.9 | 62.6 | 30.0 | 40.7 | 31 |
| 100 - 139 | 16.2 | 17.7 | 18.1 | 78.8 | 47.7 | 58.8 | 27 |
| 140 - 179 | 8.6 | 12.7 | 11.9 | 87.4 | 60.4 | 70.7 | 24 |
| 180 - 219 | 4.3 | 7.8 | 6.7 | 91.7 | 68.2 | 77.4 | 22 |
| 220 - 259 | 2.4 | 5.3 | 4.7 | 94.1 | 73.5 | 82.1 | 23 |
| 260 - 379 | 3.2 | 9.2 | 7.5 | 97.3 | 82.7 | 89.6 | 21 |
| 380 - 499 | 1.2 | 4.9 | 4.1 | 98.5 | 87.6 | 93.7 | 22 |
| 500 - 999 | 1.2 | 7.2 | 4.5 | 99.7 | 94.8 | 98.2 | 16 |
| 1000 and above | .3 | 5.2 | 1.8 | 100.0 | 100.0 | 100.0 | 9 |
| Total | 100.0 | 100.0 | 100.0 | ---- | ---- | ---- | ---- |

Source: U. S. Census.

Table 10. Trends in the number and average size of farms,¹ Newton County, Mississippi, 1929, 1939, 1944, with comparisons.

| Item | Newton County | | Shortleaf Pine Area | | Mississippi | |
|----------------------|-----------------|------------------------|---------------------|------------------------|-----------------|------------------------|
| | Number of farms | Acres of land per farm | Number of farms | Acres of land per farm | Number of farms | Acres of land per farm |
| 1929 | 3793 | 70.9 | 70,779 | 69.6 | 312,663 | 55.4 |
| 1939 | 3483 | 73.9 | 67,925 | 76.6 | 291,092 | 65.8 |
| 1944 | 3442 | 75.0 | 61,512 | 84.6 | 263,528 | 74.4 |
| Percent change from: | | | | | | |
| 1939 to 1944 | -1 | +1 | -9 | +10 | -9 | +13 |
| 1929 to 1944 | -9 | +6 | -13 | +22 | -16 | +34 |

Source: U. S. Census.

¹When a landowner has one or more tenants, renters, croppers or managers, the land operated by each is counted as a separate farm by the Bureau of the Census.

third had less than 50 acres, one-third from 50 to 100 acres and one-third over 100 acres (table 9). The latter group, which actually made up 37.4 percent of the total operating farm units, had 70 percent of the farm land and about 60 percent of the cropland harvested. The group operating less than 50 acres of farm land only had 9 percent of the farm land and 14 percent of the cropland harvested. It is interesting to note that the intensity of farm operation decreased as the acres of farm land per operating unit decreased. That is, as the acres of farm land per operating unit increased the proportion of the land that was used for crops decreased. This means that in general the operators of the larger units had enough land to allow its use for the crop to which it was best suited (row, close growing, sod or timber) and yet produce an adequate income for the farm family; whereas, in general the operators of the smaller units were forced to utilize land for row crops that was better suited to other uses in order to have as near an adequate income for the farm family as possible.

The number of farms in Newton County has been decreasing and the average size of farm increasing during recent years; however, the change has not been as pronounced as in other parts of the State.⁵ Between 1929 and 1944, the number of farms in Newton County decreased 9 percent as compared to a 13 percent decrease in the Shortleaf Pine Area and a 16 percent decrease in the State. During the same period the size of farms increased 6 percent in Newton County, 22 percent in the Shortleaf Pine Area and 34 percent in the State. In 1944, the average size of farms in Newton County was about the same as State average, but it was about 13 percent smaller than the average size of farms in the Shortleaf Pine Area (table 10).

Tenure and Color of Farm Operators

Since 1929 farm ownership in Newton County has been increasing and tenancy decreasing (table 11). This same gener-

⁵Census farms. The land farmed by a cropper or other non-managing tenant is classified as a farm by the census.

Table 11. Tenure and color of farm operators, Newton County, Mississippi, 1929, 1939 and 1944, with comparisons.

| Item | Newton County | | | Shortleaf Pine Area | | | Mississippi | | |
|-----------------------------------|---------------|------|------|---------------------|------|------|-------------|------|------|
| | 1929 | 1939 | 1944 | 1929 | 1939 | 1944 | 1929 | 1939 | 1944 |
| Percent of farms operated by: | | | | | | | | | |
| Owners ¹ | 53 | 58 | 63 | 42 | 46 | 54 | 28 | 34 | 41 |
| White owners | 41 | 46 | 50 | 34 | 37 | 44 | 21 | 26 | 31 |
| Colored owners | 12 | 12 | 13 | 8 | 9 | 10 | 7 | 8 | 10 |
| Tenants | 47 | 42 | 37 | 58 | 54 | 46 | 72 | 66 | 59 |
| White tenants | 23 | 23 | 15 | 32 | 30 | 23 | 21 | 19 | 15 |
| Colored tenants | 24 | 19 | 22 | 26 | 24 | 23 | 51 | 47 | 44 |
| White owners and tenants | 64 | 69 | 65 | 66 | 67 | 67 | 42 | 45 | 46 |
| Colored owners and tenants | 36 | 31 | 35 | 34 | 33 | 33 | 58 | 55 | 54 |
| Percent of farm land operated by: | | | | | | | | | |
| Owners ¹ | 72 | 73 | 77 | 64 | 65 | 72 | 58 | 63 | 71 |
| White owners | 59 | 62 | 66 | 54 | 56 | 62 | 48 | 54 | 61 |
| Colored owners | 13 | 11 | 11 | 10 | 9 | 10 | 10 | 9 | 10 |
| Tenants | 28 | 27 | 23 | 36 | 35 | 28 | 42 | 37 | 29 |
| White tenants | 17 | 18 | 12 | 21 | 22 | 16 | 17 | 18 | 12 |
| Colored tenants | 11 | 9 | 11 | 15 | 13 | 12 | 25 | 19 | 17 |
| White owners and tenants | 76 | 80 | 78 | 75 | 78 | 78 | 65 | 72 | 73 |
| Colored owners and tenants | 24 | 20 | 22 | 25 | 22 | 22 | 35 | 28 | 27 |

Source: U. S. Census.

¹Includes farms and farm land operated by full owners, part owners and managers.

al trend has been taking place in the Shortleaf Pine Area and in the State; however, farm ownership is more pronounced in Newton County than in the Shortleaf Pine Area or in the State. In 1944, owners operated 63 percent of the farms and 77 percent of the farm land in Newton County. In the same year owners operated 54 percent of the farms and 72 percent of the farm land in the Shortleaf Pine Area and 41 percent of the farms and 71 percent of the farm land in the State.

Farm operators in Newton County are predominantly white. In 1944, about two-thirds of the operators in Newton County were white as compared to less than one-half for the State. There has been little change in Newton County in the last 15 years either in the percentage of farms

operated by whites or in the proportion of the total farm land operated by whites. White owners have become more important, but this has been balanced by the declining importance of white tenants.

Although 37 percent of the farm families in Newton County were classed as tenants in 1944, only 17 percent of the operating farm units were operated by tenants (table 12). This is the case because in many instances the land farmed by croppers or tenants is only a part of a complete operating unit. When operating farm units in Newton County are divided into single and multiple units, 20 percent of the single units and 5 percent of the multiple operating farm units were operated by tenants in 1944. The proportion of both single and multiple

Table 12. Operating farm units: Single units and multiple units and percent operated by tenants, Newton County, Mississippi, 1944, with comparisons.

| Item | Newton County | Shortleaf Pine Area | Mississippi |
|-------------------------------------|------------------|------------------------|-------------|
| Number: | | | |
| All operating farm units | 2,615 | 44,965 | 145,407 |
| Single units | 2,113 | 36,960 | 117,021 |
| Multiple units | 502 | 8,005 | 28,386 |
| Percent operated by tenants: | | | |
| All operating farm units | 17.3 | 25.1 | 25.8 |
| Single units | 20.3 | 28.8 | 29.2 |
| Multiple units | 5.0 | 7.8 | 11.8 |

Source: U. S. Census.

Table 13. Source and amount of farm income per farm,¹ Newton County, Mississippi, 1944, with comparisons.

| Item | Newton County | Shortleaf Pine Area | Missis- sippi | United States |
|---|------------------|------------------------|------------------|------------------|
| Value of all farm products sold, traded or used, dollars ² | 1,093 | 1,175 | 1,385 | 3,148 |
| Value of all farm products sold or traded, dollars | 725 | 817 | 1,092 | 2,821 |
| Percent from crops | 66 | 75 | 83 | 46 |
| Percent from livestock | 30 | 22 | 16 | 53 |
| Percent from dairy products | 13 | 8 | 6 | 16 |
| Percent from poultry products | 8 | 5 | 3 | 10 |
| Percent from other livestock | 9 | 9 | 7 | 28 |
| Percent from forest products | 5 | 3 | 1 | — ³ |
| Value of all farm products used by farm household, dollars | 368 | 358 | 293 | 326 |

Source: U. S. Census.

¹Census farm.

²Per farm reporting farm products sold, traded or used.

³Less than .5 percent.

operating farm units that were operated by tenants was considerably higher in the Shortleaf Pine Area and in the State than in Newton County in 1944.

Farm Income

Cash income per farm family from the sale of farm products in Newton County is relatively low when compared to other sections of the country. The value of farm products sold or traded per farm family in Newton County in 1944 amounted to \$725, which was 89 percent of the average for the Shortleaf Pine Area, 66 percent of the average for the State, and 26 percent of the average for the United States (table 13). Farmers in Newton County receive a greater proportion of their cash farm income from the sale of dairy products, poultry products, other livestock products (primarily cattle and hogs) and forestry products than do farmers in the Shortleaf Pine Area and in the State. However, farm-

ers in the United States receive a much greater proportion of their income from the sale of livestock and livestock products than do farmers in Newton County.

Farmers in Newton County are relatively more self-sufficing than farmers in other sections of the country. In 1944, the value of all farm products used per farm family in Newton County averaged \$368 which was 3 percent above the average for the Shortleaf Pine Area, 26 percent above the average for Mississippi, and 13 percent above the average for the United States. Therefore, in terms of gross farm income Newton County farmers are closer to the state and national average than when only cash farm income is considered. Gross farm income per farm family in Newton County amounted to \$1,093 in 1944, which was 93 percent of the average for the Shortleaf Pine Area, 79 percent of the average for Mississippi, and 35 percent of the average for the United States.

FARMING PRACTICES IN 1946

Crops

In 1946, rainfall in Newton County was above average in 8 of the first 9 months. During this period rainfall was 25 percent above average.⁶ This resulted in cotton yields much below average and corn and hay yields above average. On the farms studied in 1946, the average yields were as follows: Cotton, 178 pounds on upland soils and 192 pounds on bottom land soils; corn, 20.4 bushels on upland soils and 21.9 bushels on bottom land soils; lespedeza sericia 1.8 tons; and soybeans or cowpea hay, 1.4 tons (table 14). The normal yield for Newton County is about 240 pounds for cotton, about 16 bushels for corn and about 1.2 tons for hay.

Fifteen of the 54 farmers from which information on cotton production was

obtained produced one-half bale or more per acre and two produced a bale per acre. Of the 65 producers from which information on corn production was obtained, 11 produced 30 bushels or more per acre and two produced 40 bushels or more per acre.

In 1946, all of the 54 farmers from which information on cotton production was obtained used fertilizer varying in amount from 100 to 600 pounds per acre. Of this group 45 used a complete fertilizer only and 9 used a complete fertilizer plus additional nitrogen. The actual pounds of plant food used per acre on upland soils averaged 20.7 pounds of nitrogen, 31.1 pounds of phosphate (P_2O_5) and 20.5 pounds of potash (K_2O). Sixty-two of the 65 producers from whom information on corn production was obtained used fertilizer varying in amount from 50 to 600 pounds per acre. Of this group, 24

⁶Weather Bureau, U.S.D.A., 1946.

used a complete fertilizer only, 37 used a complete fertilizer plus additional nitrogen and 2 used nitrogen only. The actual pounds of plant food used per acre of corn on upland soils averaged 19.9 pounds of nitrogen, 14.4 pounds of phosphate (P_2O_5) and 9.2 pounds of potash (K_2O). About 50 percent of farmers reported the use of fertilizer on hay. The average pounds of plant food applied per acre of hay crops is shown in table 14.

The records on cotton and corn production on upland soils were broken down into sub-groups on the basis of rates of fertilization, date of planting and number of cultivations in order to study the relationship of these factors to yield per acre.

Fertilization. The yield of lint cotton per acre increased from 137 pounds when an average of 42 pounds of plant food was used per acre to 211 pounds when an average of 82 pounds of plant food was

used per acre (table 15). This was an increase of 54 percent, or 74 pounds of lint cotton per acre. However, on these farms where 90 pounds or more of plant food was used per acre, the average cotton yield was 155 pounds per acre or 56 pounds less than on those farms where 80 to 89 pounds of plant food was used per acre. These results are based on a limited number of farms for only one year and they should be interpreted with care. The decreased yield resulting from the heaviest application of fertilizer was probably the result of the more than normal rainfall in 1946.

Farmers who fertilized their corn above average made 83 percent more corn per acre than those who fertilized below average (table 16). The former used an average of 32 pounds of nitrogen and 31 pounds of other plant food per acre and produced 24.6 bushels of corn per acre. The latter group used an average

Table 14. Crop practices and production, Newton County, Mississippi, 1946.

| Crop ¹ | No. of records | Acres per farm | Pounds of plant food per acre | | | Seed per acre | Production |
|-----------------------------|----------------|----------------|-------------------------------|------|------|----------------------|--------------|
| | | | N | P | K | | |
| Cotton, upland | 50 | 10.8 | 20.7 | 31.1 | 20.5 | .8 bu. | 178 lb. lint |
| Cotton, bottom | 4 | 12.8 | 28.8 | 32.5 | 21.5 | .8 bu. | 192 lb. lint |
| Corn, upland | 54 | 15.4 | 19.9 | 14.4 | 9.2 | 7 lb. | 20.4 bu. |
| Corn, bottom | 11 | 17.0 | 19.5 | 12.8 | 11.6 | 7 lb. | 21.9 bu. |
| Lespedeza hay | 9 | 7.0 | .7 | 9.5 | .5 | 23 lb. | 2.2 ton |
| Lespedeza Sericia hay | 7 | 6.3 | --- | 33.3 | --- | 35 lb. | 1.8 ton |
| Soybean or cowpea hay | 7 | 6.2 | 5.0 | 15.7 | 5.0 | 1.3 bu. ² | 1.4 ton |

Source: Farm Survey, Newton County.

¹Due to the fact that about 9 acres out of 10 in Newton County is planted to cotton, corn and hay, the number of records secured for other crops was insufficient to give reliable averages.

²When broadcast; .6 bu. drilled.

Table 15. Rates of fertilization related to cotton yields, upland soils, Newton County, Mississippi, 1946.

| Pounds of plant food per acre | No. of farms | Acres of Cotton per farm | Plant food | Nitrogen | Other | Yield | No. of cultivations |
|-------------------------------|--------------|--------------------------|------------|----------|---------------------|----------|---------------------|
| | | | per acre | per acre | plant food per acre | per acre | |
| | | | pounds | pounds | pounds | pounds | |
| 20-59 | 10 | 8.0 | 42.2 | 13.4 | 28.8 | 137 | 4.2 |
| 60-79 | 14 | 10.2 | 63.7 | 17.6 | 46.1 | 187 | 4.4 |
| 80-89 | 16 | 14.3 | 81.6 | 24.1 | 57.5 | 211 | 4.2 |
| 90 and above | 10 | 8.9 | 99.8 | 27.1 | 72.7 | 155 | 4.3 |
| All farms | 50 | 10.8 | 72.3 | 20.7 | 51.6 | 178 | 4.3 |

Source: Farm Survey, Newton County.

of 8 pounds of nitrogen and 12 pounds of other plant food and produced 14.4 bushels of corn per acre. That is, an additional 24.1 pounds of nitrogen and 18.5 pounds of other plant food increased production an average of 10.2 bushels per acre. If the average cost of plant food was calculated at 10 cents per pound, the fertilizer cost per additional bushel of corn would be 42 cents. The majority of farmers grew between 4,000 and 5,000 plants per acre.

Date of Planting. Cotton was planted in April and May, with about two-thirds of the farmers planting in April. Cotton planted in April produced about 18 percent more per acre than cotton planted

in May (table 17). Fertilization and cultivation could not have been factors influencing this result in that the rate of fertilization and the number of cultivations averaged approximately the same for both groups.

Corn was planted in March, April, and May (table 18). Corn planted in March produced 17 percent more than corn planted in April and 15 percent more than corn planted in May. Rates of fertilization and the number of cultivations averaged about the same for the three groups.

Cultivation. About 60 percent of the farmers cultivated their cotton less than 5 times. The remainder cultivated their

Table 16. Rates of fertilization related to corn yield, upland soils, Newton County, Mississippi, 1946

| Rate of fertilizer applied | No. of farms | Nitrogen per acre | Other plant food per acre | Total plant food per acre | Acres per farm | No. of cultivations | Yield per acre |
|--|--------------|-------------------|---------------------------|---------------------------|----------------|---------------------|----------------|
| | | | | | | | |
| Nitrogen above average and other plant food above average ¹ | 16 | 32.1 | 30.5 | 62.6 | 17 | 3.9 | 24.6 |
| Nitrogen below average and other plant food below average ² | 15 | 8.0 | 12.0 | 20.0 | 13 | 3.9 | 14.4 |
| Average all farms | 54 | 19.9 | 23.6 | 43.5 | 15 | 3.8 | 20.4 |

Source: Farm Survey, Newton County.

¹Above average for the 54 farms.

²Below average for the 54 farms.

Table 17. Date of planted cotton related to yield, upland soils, Newton County, Mississippi, 1946.

| Date of planting | No. of farms | Acres of cotton per farm | Average No. of cultivations | Average per acre (pounds) | |
|------------------|--------------|--------------------------|-----------------------------|---------------------------|---------------|
| | | | | Plant food | Yield of lint |
| April | 36 | 10.5 | 4.3 | 71.8 | 186 |
| May | 14 | 11.5 | 4.4 | 73.8 | 157 |
| All farms | 50 | 10.8 | 4.3 | 72.3 | 178 |

Source: Farm Survey, Newton County.

Table 18. Date of planting corn related to yield, upland soil, Newton County, Mississippi, 1946.

| Date of planting | No. of farms | Acres per farm | Nitrogen per acre | Other plant food per acre | Total plant food per acre | No. of cultivations | Yield per acre |
|-------------------------|-----------------|----------------|-------------------|---------------------------|---------------------------|---------------------|----------------|
| | | | | | | | |
| March | 6 | 9 | 17.3 | 26.3 | 43.6 | 3.8 | 22.5 |
| April | 21 | 12 | 20.2 | 22.5 | 42.7 | 3.9 | 19.2 |
| May | 11 | 17 | 20.4 | 19.7 | 40.1 | 3.9 | 19.5 |
| Average all farms | 54 ¹ | 15 | 19.9 | 23.6 | 43.5 | 3.8 | 20.4 |

Source: Farm survey, Newton County.

¹Some farmers planted in more than one month.

cotton 5 times or more and produced 17 percent more cotton than the group cultivating less than 5 times. Plant food applied per acre averaged approximately the same for the two groups (table 19).

Apparently the number of cultivations was not important as far as corn production was concerned. The group of farmers who cultivated four times produced 17 percent more corn per acre than those who cultivated less than 4 times and about 8 percent more than those who cultivated over four times; however, the group who cultivated 4 times used about one-third more fertilizer per acre than did either of the other groups. Forty-four percent of the farmers cultivated less than 4 times per acre, 30 percent cultivated 4 times per acre and 26 percent cultivated over 4 times per acre (table 20.)

Livestock

Milk was produced for sale on all 43 farms on which information was obtained relating to livestock production practices. Data related to poultry and pork production practices are representative of conditions on dairy farms and cannot be in-

terpreted as being representative of production practices on farms where poultry or pork production is a major enterprise. However, it was felt that poultry and pork production practices on these farms were representative of conditions on most farms in the county where poultry and pork production are minor enterprises and produced mostly for home consumption.

Most of the dairy herds were small on the 43 farms studied; 15 had 5 cows or less, 30 had 10 cows or less and 41 had 20 cows or less. Thirty-eight of the group sold milk or cream to manufacturing plants, four sold to Grade A processors and one retailed Grade A milk. Most of the cattle were grade Jerseys, although there were a few scattered registered Jerseys.

Nineteen farmers had their own breeding bull, 12 farmers paid breeding fees, and 12 farmers used their neighbor's bull without charge. Artificial insemination was used on a few farms. Seven farmers bought replacement cows and four sold cows for replacement.

Table 19. Number of cultivations related to cotton yields, upland soils, Newton County, Mississippi, 1946.

| Number of cultivations | Number of farms | Acres of cotton per farm | Plant food per acre | Yield per acre | No. of cultivations | Number of hoeings |
|------------------------|-----------------|--------------------------|---------------------|----------------|---------------------|-------------------|
| | | | pounds | pounds | | |
| Under 5 | 31 | 11.4 | 72.0 | 168 | 3.7 | 1.6 |
| 5 or more | 19 | 9.9 | 73.0 | 196 | 5.4 | 1.7 |
| All farms | 50 | 10.8 | 72.3 | 178 | 4.3 | 1.6 |

Source: Farm survey, Newton County.

Table 20. Number of cultivations related to corn yields, upland soils, Newton County, Mississippi, 1946.

| No. of cultivations | No. of farms | Acres per farm | Nitrogen per acre | Other plant food per acre | Total plant food per acre | No. of cultivations | Yield per acre |
|-------------------------|--------------|----------------|-------------------|---------------------------|---------------------------|---------------------|----------------|
| | | | pounds | pounds | pounds | | bushels |
| Under 4 | 24 | 15 | 19.5 | 20.7 | 40.2 | 2.8 | 19.0 |
| Four | 16 | 17 | 22.2 | 30.4 | 52.6 | 4.0 | 22.3 |
| Over 4 | 14 | 14 | 18.1 | 20.6 | 38.7 | 5.2 | 20.6 |
| Average all farms | 54 | 15 | 19.9 | 23.6 | 43.5 | 3.8 | 20.4 |

Source: Farm survey, Newton County.

The majority of farmers used the general barn for the dairy herd. Thirty-three farmers had a general barn only; the remaining 10 had additional buildings for the dairy enterprise. For fencing, the majority of farmers used 3 strands of 4-point wire on untreated wood posts. Six farmers used milking machines.

Grazing furnished cattle on most farms was unimproved open pasture and woodland pasture. Only eight of the 43 farmers had improved pasture, that is, pasture which had been fertilized and/or clipped

when needed. Six farmers provided temporary summer pasture of lespedeza, Sudan grass or millet for a period varying from one and one-half to three months. Winter grazing of oats and/or winter legumes was provided by 20 farmers for a grazing period of from one to three and one-half months.

Production per cow unit on the farms studied averaged 3227 pounds of milk, 86 pounds of beef on foot, and \$4.44 of other sales (table 21). Of the 43 farmers from which information on milk produc-

Table 21. Livestock practices and production, 43 farms, Newton County, Mississippi, June 1, 1946-May 31, 1947.

| | Dairy cow unit ¹ | One hen ⁵ | One hundred lb. of pork ⁷ | One head of livestock |
|---------------------------------------|---------------------------------|----------------------|--------------------------------------|-----------------------|
| Production: | 3227 lb. milk | 6.69 doz. eggs | 100 lb. pork | |
| | 86 lb. L.W. beef ² | 1.58 lb. L.W. hens | | |
| | \$4.44 other sales ³ | 1.88 lb. L.W. fryers | | |
| Used in production: | | | | |
| Corn, lb. | 1123 | 29.1 | 381 | 2744 |
| Oats, lb. | 174 | ---- | 1 | 83 |
| Cottonseed meal, lb. | 683 | ---- | 1 | 4 |
| Soybean meal, lb. | 275 | .5 ⁶ | 1 ⁶ | 2 |
| Mixed and other feed, lb. | 193 | 6.3 | ---- | 11 |
| Total concentrates, lb. | 2448 | 35.9 | 384 | 2844 |
| Cottonseed hulls, lb. | 222 | ---- | ---- | ---- |
| Legume hay, lb. | 1148 | ---- | ---- | 1217 |
| Grass hay, lb. | 764 | ---- | ---- | 1041 |
| Total roughage, lb. | 2134 | ---- | ---- | 2258 |
| Minerals, lb. | 3 | ---- | ---- | ---- |
| Salt, lb. | 34 | ---- | ---- | 31 |
| Open permanent pasture, acres | 2.71 | ---- | .04 | 2.07 |
| Woodland pasture, acres | 2.49 | ---- | ---- | 1.89 |
| Temporary summer pasture, acres | .14 | ---- | ---- | .07 |
| Winter pasture, acres | 1.09 | ---- | ---- | .62 |
| Crop aftermath, acres | 3.45 | ---- | ---- | 2.63 |
| Man labor, hours | 130 ⁴ | 4.0 | 9 | 36 |

Source: Farm survey, Newton County.

¹One dairy cow and the average amount of other dairy cattle kept for replacements or other reasons. On these farms .8 head of other dairy cattle was kept for each cow milked.

²Includes 53 pounds of cull cows and 33 pounds of other cattle sold for slaughter.

³Includes \$2.32 for replacements sold, \$2.03 for increase in inventory minus purchases, \$0.04 for bob calves sold and \$0.05 for breeding fees and hides sold.

⁴On 36 of the 43 farms the cows were milked by hand and the milk sold to manufacturing plants. Labor requirement per cow unit on these farms was 135 hours. The average size of herd was 8.6 cows.

⁵One hen plus the average number of other poultry kept or raised per hen. The size of flock averaged 37 hens per farm.

⁶Soybean meal or other protein supplement.

⁷Pork sold and killed averaged 759 pounds liveweight per farm; however, net production per farm averaged only 700 pounds liveweight per farm because of animals purchased and decreases in inventories.

tion was obtained, nine produced more than 4,000 pounds of milk per cow and 3 produced more than 5,000 pounds per cow. Feed consumed per cow unit averaged 2,448 pounds of concentrates and 2,134 pounds of roughage. The concentrate mixture averaged 23 percent protein. Grazing furnished per cow unit averaged 2.7 acres of open pasture, 2.5 acres of woodland pasture, .14 acres of temporary summer pasture, 1.1 acres of winter grazing and 3.45 acres of crop aftermath. Labor requirements per cow unit averaged 130 hours.

Poultry flocks were small and mostly for home use. None of the farmers reported more than 75 hens. Only one farm was without a flock of hens. A wide variety of breeds was found with Plymouth Rocks and Barred Rocks being the two reported most often. Twenty-two of the 42 farmers having poultry flocks sold eggs, 14 sold hens and 11 sold fryers. Sixty percent of the eggs produced, 54 percent of the hens sold or eaten, and 82 percent of the fryers sold or eaten were consumed in the farm home. Twelve farmers bought their baby chicks, and five had brooder houses. Hen houses were small and in many cases were made of scrap lumber. Some of the farms were without hen houses.

Production per hen unit on these farms averaged 6.69 dozen eggs; 1.58 pounds of hens, not dressed; and 1.88 pounds of fryers, not dressed. Feed consumed per hen unit averaged 36 pounds, of which 29 pounds was corn. Labor requirement per hen unit was 4 hours, or 148 hours per average flock of 37 hens.

The hog enterprise was small on most farms, and all farms except one had a hog enterprise. Only 7 of the 43 farmers reported the sale of hogs or pork products, and 89 percent of the pork produced on the 43 farms was consumed in the farm home. Hogs found on practically all farms were Poland-China or Poland-China mixed. About one-half of the farmers kept sows and raised their own

pigs, the balance purchased pigs and fed them out.

Pork production per farm averaged 700 pounds, liveweight. Feed consumption per 100 pounds of pork average 384 pounds, of which corn accounted for 381 pounds. Seven farmers had permanent pastures for hogs, none supplied supplementary pastures. Labor requirement for pork production was 9 hours per 100 pounds of pork produced, or 63 hours per farm.

Each of the 43 farms studied had one or more head of workstock. About four-fifths of the workstock were mules. Feed consumed per head of workstock averaged 2,844 pounds of concentrates and 2,258 pounds of roughage. Grazing furnished per head of workstock averaged 2.1 acres of open pasture, 1.9 acres of woodland pasture, .1 acre of temporary summer pasture, .6 acres of winter grazing and 2.6 acres of crop aftermath. Man labor required to care for one head of workstock for one year was 36 hours.

The dairy herds were broken down into groups on the basis of the amount of feed fed per cow unit and on the basis of grazing furnished, in order to study the relationship of these factors to milk production.

Feed. Apparently barn feeding alone is not the answer to economical milk production in Newton County. The 10 farmers who fed heaviest produced 858 pounds more milk per cow than did the 11 farmers who fed lightest; however, they fed 2,407 pounds more concentrates and 2,356 pounds more roughage per cow unit (table 22). Based on average prices for the 5-year period 1935-39, the additional milk produced per cow by the heaviest feeders would be valued at \$15.70, but the additional feed consumed per cow unit would be valued at \$56.43.⁷ The value of cattle and calves sold per cow unit was about the same for both

⁷Value of milk: $858 \times \$1.83$ per cwt.; value of feed: $2407 \times \$1.85$ per cwt. + $2356 \times \$10.10$ per ton.

groups. Inadequate grazing, poor management of cows, and cows of low capacity can dissipate much of the results ordinarily expected from heavier barn feeding.

Grazing. Adequate grazing appears to be the most important factor affecting economical milk production in Newton County. The farmers who had improved pastures and provided their cows with winter grazing produced 1,451 pounds more milk per cow than did the farmers who had unimproved pastures and no winter grazing (table 23). This increased production (46 percent more) was accomplished by feeding 27 percent more concentrates, 27 percent less roughage and by utilizing about 10 percent less land for pasture and grazing crops per cow unit. That is, both groups did about the same amount of barn feeding and used about the same amount of land for

pasture and grazing crops. The quality and amount of grazing was the big difference. In addition, the group of farmers providing improved pasture and winter grazing sold a greater proportion of their milk during the winter months when milk prices are highest.

Labor and Power

Mules are still used for power on the majority of farms in Newton County, and they are relatively more important sources of power here than in the State as a whole. According to the 1945 Census of Agriculture only 7 percent of the operating farm units had tractor power in Newton County as compared to 10 percent for the State. However, the use of tractor power in Newton County, as in other parts of the State has been increasing rapidly. The number of farms with tractors in Newton County increased from 67 in 1940 to 186 in 1945, an in-

Table 22. Relationship of total digestible nutrients¹ fed per cow unit to production and other factors affecting production, Newton County, Mississippi, June 1, 1946-May 31, 1947.

| TDN fed per cow unit | No. of farms | Average No. of cows | No. of other cattle per cow | Average per cow unit (pounds) | | | |
|----------------------|--------------|---------------------|-----------------------------|-------------------------------|------------------|--------------|---------------|
| | | | | T.N.D. fed | Concentrates fed | Roughage fed | Milk produced |
| Under 2000 | 11 | 7 | .75 | 1387 | 1067 | 1110 | 2626 |
| Above 3500 | 10 | 9 | .89 | 4443 | 3474 | 3466 | 3484 |
| All farms | 43 | 9 | .82 | 2976 | 2428 | 2134 | 3227 |

Source: Farm survey, Newton County.

¹Commonly called T.D.N.

Table 23. Relationship of grazing furnished per cow unit to production and other factors affecting production, Newton County, Mississippi, June 1, 1946-May 31, 1947.

| Item | Unit | Unimproved pasture and no winter grazing | Improved pasture and winter grazing | All farms |
|---------------------------------|---------|--|-------------------------------------|-----------|
| Number of farms | number | 17 | 5 | 43 |
| Average number of cows | number | 5 | 11 | 9 |
| Other cattle per milk cow | number | .73 | .60 | .82 |
| Average per cow unit: | | | | |
| Open permanent pasture | acre | 3.06 | 1.42 | 2.71 |
| Woodland pasture | acre | 2.80 | 1.55 | 2.49 |
| Winter pasture | acre | 0 | 1.87 | 1.09 |
| Temporary summer pasture | acre | 0 | .34 | .14 |
| TDN fed | pound | 2827 | 2980 | 2976 |
| Concentrates fed | pound | 2071 | 2640 | 2448 |
| Roughage fed | pound | 2525 | 1842 | 2134 |
| Milk produced | pound | 3137 | 4588 | 3227 |
| Milk sold, October-March | percent | 37.5 | 45.5 | 38.3 |

Source: Farm survey, Newton County.

crease of 178 percent. This rate of increase was about double that for the State, which increased 85 percent in the number of farms having tractors during the same period.

The majority of farmers owning tractors use them only for seedbed preparation and continue to cultivate their crops with half-row mule equipment. Of the 28 farms on which tractor-labor schedules were obtained, only 9 had cultivating equipment and a disc was the only equipment reported on eight farms. The total tractor equipment reported on the 28 farms included 28 discs, 9 combines, 9 harrows, 9 cultivators, 7 mowers, 5 breaking plows, 5 busters, 5 grain drills, 4 hay balers, 3 rakes, 3 fertilizer distributors, 3 planters, 3 stalk cutters, 3 wagons, and 1 weeder. None of the farmers that were interviewed regarding specific crop practices, reported the use of tractors in cultivation although about 30 percent of them reported the use of tractors in seedbed preparation. Practically all of this group reported the use of half-row mule equipment for cultivation.

Labor requirements for standard operations were obtained on 28 farms using tractor power and on 31 farms using mule power. The number of records ob-

tained for most tractor operations was insufficient for reliable averages; therefore, it was necessary to supplement them with results from other studies. Also, labor requirements for standard operations when using mule power were checked with the results from other studies.

Power and labor requirements for standard operations when using one mule, two mules, a one-row tractor or a two-row tractor are shown in table 24. An observation of this table will show the extent to which the amount of work accomplished per man can be increased by utilizing more power. For example, the two-row tractor will cultivate almost twice as many acres of row crops in a 10-hour day as a one-row tractor; the one-row tractor will cultivate about one and one-half times as many acres of row crops in a 10-hour day as the two-mule one-row cultivator; and the two-mule one-row cultivator will cultivate almost twice as many acres of row-crops in a 10-hour day as the half-row one-mule plow. The man with a two-row tractor can break about three and one-half times as many acres of land in a 10-hour day as the man with two mules. Moreover, lights can be attached to the tractors and work performed at night during rush seasons.

IMPROVED FARMING PRACTICES

Crops

It should be emphasized in the beginning that the high crop yields associated with improved practices in the discussion that follows are dependent upon good land use and a level of management above the average for this area at the present time. These yield levels are indicative of what good farm managers can do when they use the best known practices on crops grown on land to which they are suited.

Cotton. For the best results cotton should be planted in April in this area. Deltapine, Stoneville 2B, Coker 100

Wilt on wilt infested soils and Empire are the varieties that have shown up best in this area. At present stages of development, flame cultivation and picking cotton by machine are not economical in this area because of the small size of operating units and chemical weed control is still in the experimental stage. Therefore, hand labor for weed control and harvesting in this area appears necessary for some time to come. If cotton is hilldropped to a stand and the rotary hoe used with early tractor cultivations, one hand hoeing for weed control and 5 or 6 cultivations will be sufficient to keep the

Table 24. Hours of labor and power required per acre¹ for standard operations with mule power and tractor power, hill counties, Mississippi.

| Operation | One mule | | Two mules | | One-plow (1-row) tractor ² | | Two-plow (2-row) tractor ³ | |
|---|-----------------|-----|--------------------------------|------|---------------------------------------|-----|---------------------------------------|-----|
| | M | H | M | H | M | T | M | T |
| Cut stalks | 1.5 | 1.5 | 1.3 | 2.6 | .7 | .7 | .4 | .4 |
| Break land: | | | | | | | | |
| Plow, turn | 8.0 | 8.0 | 5.0 | 10.0 | 2.5 | 2.5 | 1.4 | 1.4 |
| Plow, disc | --- | --- | --- | --- | 2.5 | 2.5 | 1.4 | 1.4 |
| Disc | --- | --- | 1.8 | 3.6 | .8 | .8 | .6 | .6 |
| Harrow | 1.5 | 1.5 | .9 | 1.8 | .6 | .6 | .4 | .4 |
| Cultipacker | --- | --- | .9 | 1.8 | .6 | .6 | .4 | .4 |
| Bed: | | | | | | | | |
| Middlebuster | 2.4 | 2.4 | 1.6 | 3.2 | 1.0 | 1.0 | .6 | .6 |
| Plow, 2 furrows | 3.0 | 3.0 | 3.0 | 6.0 | --- | --- | --- | --- |
| Plant and fertilize row crops: | | | | | | | | |
| Planter | 1.6 | 1.6 | --- | --- | --- | --- | --- | --- |
| Distributor | 1.7 | 1.7 | --- | --- | --- | --- | --- | --- |
| Planter and distributor | --- | --- | --- | --- | 1.2 | 1.2 | .7 | .7 |
| Plant and fertilize other crops: | | | | | | | | |
| Seed and fertilize with grain drill | --- | --- | --- | --- | 1.4 | .7 | 1.0 | .5 |
| Seed grass or clover with grain drill | --- | --- | --- | --- | .7 | .7 | .5 | .5 |
| Fertilize with grain drill | --- | --- | --- | --- | 1.4 | .7 | 1.0 | .5 |
| Fertilize with lime spreader | --- | --- | --- | --- | .8 | .4 | .6 | .3 |
| Cultivate row crops | 3.0 | 3.0 | 1.6 | 3.2 | 1.0 | 1.0 | .6 | .6 |
| Cultivate and sidedress row crops | --- | --- | --- | --- | 1.2 | 1.2 | .7 | .7 |
| Combine | --- | --- | --- | --- | 2.6 | 1.3 | 2.0 | 1.0 |
| Mow | --- | --- | 1.5 | 3.0 | .8 | .8 | .6 | .6 |
| Rake: | | | | | | | | |
| Dump | --- | --- | .8 | 1.6 | .6 | .6 | .4 | .4 |
| Side delivery | --- | --- | --- | --- | --- | --- | .5 | .5 |
| Push hay to baler, 1 ton | --- | --- | .7 | 1.4 | .6 | .6 | .5 | .5 |
| Bale, 1 ton: | | | | | | | | |
| Stationary baler | --- | --- | 10.0 | 5.0 | 3.9 | 1.3 | 3.0 | 1.0 |
| Pick up baler | --- | --- | --- | --- | --- | --- | .5 | .5 |
| Hauling: | | | | | | | | |
| Loose hay, 1 ton | --- | --- | 5.0 | 5.0 | 4.0 | 2.0 | 3.6 | 1.8 |
| Baled hay, 1 ton | --- | --- | 1.4 | 1.4 | 1.0 | .5 | .8 | .4 |
| Cotton, 1 bale | --- | --- | 6.0 | 12.0 | 5.0 | 5.0 | 2.5 | 2.5 |
| Oats, 40 bushels | --- | --- | 1.4 | 1.4 | 1.0 | .5 | .8 | .4 |
| Harvest corn by hand and haul, 20 bushels | --- | --- | 6.6 | 4.4 | 7.6 | 1.9 | 7.2 | 1.8 |
| | Hand operation: | | | | | | | |
| Hoe cotton, 1 time over | 10.0 | | Fertilize crops | | | | 2.0 | |
| Hoe or thin corn, 1 time over | 6.2 | | Cut stalks | | | | 3.0 | |
| Pick cotton, 150 lb. seed cotton | 10.0 | | Shock (bunch hay), 1 ton | | | | 2.5 | |
| Sow grain, hay or pasture crops | 1.0 | | | | | | | |

Source: Estimations based upon the following studies: Newton County farm survey; farm surveys made in other hill counties in Mississippi; Georgia Experiment Station Bull. No. 256, *Cost and Utilization of Tractor Power and Equipment on Farms in the Lower Piedmont*, by J. C. Elrod and W. T. Fullilove, 1948; Alabama Expt. Sta. Bull. No. 260, *Farm Power and Equipment Cost in Northern Alabama*, by Ben T. Lanham, Jr., 1947; Arkansas Expt. Sta. Bull. No. 456, *Labor and Power Used for Arkansas Crops and Livestock*, by M. W. Slusher and W. T. Wilson, 1945; *Combination of Enterprises on Plantations in the Lower Arkansas River Delta*, Arkansas Expt. Sta. Bull. No. 449, by John W. White, 1944; Louisiana mimeographed circular No. 56, *Farm Mechanization in the Delta*, by Frank D. Barlow, Jr. and Leo J. Fenski, 1946; and North Carolina Expt. Sta. Tech. Bull. No. 84, *Farm Mechanization in the Piedmont*, by R. E. L. Greene, H. Brooks James and C. G. Dawson, 1947.

¹Unless otherwise specified. ²Tractor averaging about 11 horsepower based on Test H of the Nebraska Tractor Tests. ³Tractors averaging about 15 horsepower based on Test H of the Nebraska Tractor Tests.

cotton clean under normal conditions; however, if cotton is drilled and cultivated with typical mule equipment, an additional thinning or hoeing operation will be required.

This production program plus, (1) the rates of fertilization shown in table 25, (2) planting cotton on good cotton land only and (3) poisoning weevils at the proper time, will produce an average of from 300 to 550 pounds of lint cotton per acre depending on the quality of soil and whether or not the highest or lowest recommended rate of fertilizer is used. In some years the yield would be lower than that indicated and in some years it would be higher due to variations in weather conditions.⁸ In most cases farmers will find it profitable to shift land that will not produce as much as 300 pounds of lint cotton per acre with improved practices to other uses; the possible exception would be small farmers with limited alternatives.

Corn. Highest yields are obtained from corn planted in March and April, although corn can be planted later on bottomland soils with good results. Dixie 11 or Funk G714 are the varieties best adapted to this area. Dixie 17 can be planted for hogging off. All three of these varieties are hybrids. A thick stand of about 10,000 plants per acre is required if heavy yields are to be obtained. Planting corn to a stand plus the use of the rotary hoe with early tractor cultivations (or the use of the section harrow for early mule cultivation) eliminates the necessity of thinning or hoeing corn. Two or three cultivations will usually be sufficient.

This production program plus the rates of fertilization shown in table 25 and planting corn on good land only will average producing from 50 to 80 bushels

of corn per acre depending on the quality of the soil. It is the combination of heavy fertilization plus thick spacing that produces high yields. Increasing fertilization materially without increasing the number of plants per acre will give disappointing results. The average yield for this area for the past few years has been about 16 bushels, which is about one-third to one-fourth of what can be produced with the practices outlined above.

Sweetpotatoes. For best results plant 10,000 to 12,000 Porto Rico Unit One plants per acre in April or May. The earlier plantings usually produce the higher yields. Three to four cultivations plus one hoeing is sufficient under normal conditions. These production practices plus the rate of fertilization shown in table 25 will produce from 160 to 200 bushels of sweetpotatoes per acre, of which about 65 percent will grade number 1. This is in contrast to an average yield of about 90 bushels for this area.

Oats for grain and grazing or grazing only. Plant from 4 to 5 bushels of one of the Red Rust Proof oats per acre in September. Oats for grazing should be seeded on a good firm seedbed and cultivated. Fertilization should be at the rate of 30 to 60 pounds of nitrogen (N) and 60 to 90 pounds of phosphate (P_2O_5) per acre at planting and 30 to 60 pounds of nitrogen March 1. With these practices and under normal conditions oats will produce a pasture that will carry one cow to two acres or one 400 to 500 pound calf to one acre. Under favorable weather conditions grazing may be started as early as October 15, however, under unfavorable weather conditions the date of starting grazing may be delayed as late as the last of December. If a grain crop is desired the cattle can be removed from the oats about March 1, and a grain crop of 30 to 40 bushels per acre allowed to mature. This is to be contrasted with the present yield of approximately 22 bushels of oats per acre plus some grazing in late winter and early spring.

⁸Between 1938 and 1947, the average change in the yield of cotton from one year to the next was 80 pounds in Newton County; the greatest change from one year to the next was 147 pounds between 1941 and 1942.

Lespedeza after oats. The fertilizer for lespedeza following oats should be applied at the time the oats are planted. About 30 pounds of lespedeza seed per acre should be sowed on the oats, without further land preparations, in late February or early March. Common and Kobe are the varieties best adapted to the

Table 25. Recommended rates of seeding and of fertilization and estimated yield per acre for the major crops adapted to Newton County.¹

| Crop | Seed per acre | Fertilization per acre ² | Estimated yield |
|--|---|--|---|
| Cotton | 12-20 lbs. of delinted seed ³ | Upland soils: 600-1200 lbs. of 6-8-4 or 600-900 lbs. of 5-10-5 plus 16-30 lbs. of nitrogen (N). Valley soils: 600-1200 lbs. of 4-10-7 or 500-1000 lbs. of 6-8-8. | 300-550 lbs. of lint ⁴ |
| Corn | 12 lbs. | 500 lbs. of 6-8-8, 6-8-4 or 5-10-5 at planting time plus 60 to 70 lbs. of nitrogen (N) when plants are knee high. | 50-80 bushels ⁵ |
| Sweetpotatoes | 6 to 8 bu. ⁶ | 1000 lbs. of 6-8-8 or 5-10-5 | 160-200 bu.; about 65 percent No. 1 |
| Oats for grazing only or for grazing and grain | 4 to 5 bu. | 30 to 60 lbs. of nitrogen (N) and 60 to 90 lbs. of phosphate (P ₂ O ₅) at planting and 30 to 60 lbs. of nitrogen (N) about March first. | Grazing, Nov.-May (2 acres per cow); or grazing Nov.-March and 30-40 bu. of oats. |
| Lespedeza after oats | 30 lbs. | First year on land: Lime to pH of 6.5 plus 80 lbs. of phosphate (P ₂ O ₅) and 50 lbs. of potash (K ₂ O). Each year thereafter use 40 lbs. of phosphate (P ₂ O ₅) and 25 lbs. of potash (K ₂ O). | 2 tons of hay |
| Sudan grass ⁷ | 10 lbs. in rows | 30 lbs. of nitrogen (N) when planted and 30 lbs. of nitrogen (N) August. | Grazing, July-Sept. (3 cows per acre). |
| Permanent pasture | Dallis grass, 12 lbs.; lespedeza, 15 lbs.; White Dutch clover, 4 lbs. | To establish: Lime to pH of 6.5 plus 100 lbs. of phosphate (P ₂ O ₅). Add 100 lbs. of potash (K ₂ O) on sandy soil. Each year thereafter add 60 lbs. of phosphate (P ₂ O ₅) and 500 to 1000 lbs. of lime every five years; or 500 lbs. of basic slag annually; add 50 lbs. of potash (K ₂ O) every other year on sandy soil. | Grazing, April-November. (2 acres per cow). |

¹Proper land utilization and good management assumed.

²Fertilizer requirements other than for commercial mixtures are given in pounds of plant food, not pounds of fertilizer material. For example, 100 lbs. of 20 percent superphosphate contains 20 lbs. of phosphate (P₂O₅), 100 lbs. of nitrate of soda contains 16 lbs. of nitrogen (N), 100 lbs. of ammonium nitrate contains 32.5 lbs. of nitrogen (N) and 100 lbs. of 50 percent of potash contains 50 lbs. of potash (K₂O).

³Hill dropped to a stand; 12 lbs. of acid delinted or 20 lbs. of mechanically delinted seed.

⁴The lower yield would be obtained if the lower rate of fertilization were applied to land that would average 100 lbs. of lint cotton per acre without fertilizer; the higher yield would be obtained if the higher rate of fertilizer were applied to land that would average 250 lbs. of lint per acre without fertilizer.

⁵The lower yield would be obtained on land that would average about 10 bu. per acre without fertilizer, and the higher yield on land that would average 30 bu. per acre without fertilizer.

⁶10,000 to 12,000 plants.

⁷Millet can be substituted for sudan grass.

Sand-Clay Hills. If fertilized according to recommendations, an average of at least two tons of hay would be produced per acre which is about twice the average yield at the present.

Sudan grass. For best results plant Sweet or Tift Sudan in rows and cultivate as needed. More forage is produced if planted in this manner than if broadcast and only about one-third as many seed are required. Sudan can be planted as early as April; however, it is usually planted about June 1, as a second crop following small grain or spring clover. If fertilized according to recommendation, this crop will furnish grazing for 3 cows in rotation with permanent pasture from about July 15 to September 15. Clipping when the grass becomes tough will improve the quality of grazing and increase the amount of forage consumed. Millet can be substituted for Sudan grass.

Permanent pasture. In preparing the seedbed for permanent pasture apply one-half of the lime, flat break, apply balance of lime and fertilizer, disc and cultipack or harrow. Plant Dallis grass on the entire acreage in August or September; plant lespedeza on about three-fourths of the area the following February; and plant White Dutch clover on the other fourth of the area between the following June and November. Planting the two crops on separate parts of the pasture keeps the White Dutch from crowding out the lespedeza when it should be getting started in the spring and in addition provides a better distribution of legume grazing because the White Dutch produces about three times as much grazing per acre in the spring as the lespedeza does in summer, because of differences in conditions for growth. For best results, plant White Dutch on bottom land soils and lespedeza on hill soils. The White Dutch clover is not seeded until after Dallis grass has been established in order to prevent the shading of young grass plants and in addition an established grass cover serves as a protection

to the clover seedlings. Before seeding, the land should be put into shape for mowing and the pasture should be mowed as needed. Mowing controls undesirable plants, improves the palatability of forage and increases the amount of forage consumed by livestock per acre. These production and management practices plus the applications of the recommended amounts of fertilizer will produce a pasture that will carry an average of one cow unit to each two acres. At present, about 6 acres of unimproved pasture is required per cow unit.

Farm Woodland; Good management of farm woodland includes (1) improvement cutting of non-merchantable timber for fuel wood, (2) protection of woodland from fires and injury by livestock,⁹ (3) improvement cuttings for commercial sale of sawlogs, pulpwood, etc., (4) better management plans—setting up silvicultural system of cutting, and (5) proper harvesting and good utilization practices.

Foresters of the Mississippi Experiment Station estimate that the present stand on forest lands of Newton County averages about 2,000 board feet. Based on good management, it would take these average stands 20 to 25 years to reach a full stand of 8,000 board feet, if no cuttings were made other than improvement cuttings of non-merchantable timber for fuel wood.¹⁰ After a full stand is reached, a sustained yield of about 400 board feet of sawlogs and .4 cord of pulpwood and .1 cord of fuel wood could be expected per acre per year.

⁹A limited amount of controlled grazing can be done with beneficial results in that the hardwoods, which are less desirable than pine, would be controlled to some extent.

¹⁰Based upon annual growth that would increase from about 180 board feet per acre with a thin stand of 2,000 board feet per acre to about 400 board feet per acre when a full stand is reached.

Alternative method of improving farm woodland and at the same time realizing some income from them in addition to the very low income from the sale of non-merchantable timber for fuel wood, is to cut a certain percentage of the added growth at the end of each five years. For example, if 25 percent of the added growth were cut at the end of each five years, it would take 25 to 30 years to reach a full stand; if 50 percent were cut, it would take 35 to 40 years to reach a full stand; and if 75 percent were cut, it would take 60 to 65 years to reach a full stand.

From the standpoint of the average farmer, cutting 50 percent of the added growth seems to be the most practical procedure to follow in building farm woodlands to a full stand. If none of the merchantable timber is sold until a full stand is reached or if only 25 percent of the added growth is cut every 5 years, the income from the farm woodland will be very low during all or most of the life of the farm owner. On the other hand, if 75 percent of the added growth is cut every 5 years, income during the early years of the improvement program would be higher but it would take too long to reach a full stand.

If 50 percent of the added growth is cut every 5 years, the average annual gross income per acre for the first 5-year period will be about \$1.09 if sold as stumpage, \$1.96 if sold after being cut and placed in position to be hauled and \$3.00 if sold delivered. The average annual income per acre will grow at an increasing rate as the stand increases until a full stand is reached. The annual income per acre for the last 5-year period before a full stand is reached will be about half of what it will be on a sustaining basis thereafter, because only half of the added growth would be cut at that time. After the full stand is reached all the added growth would be cut every 5 years and the annual gross income per acre would be about \$4.05 if sold as

stumpage, \$7.25 if sold after being cut and placed in position to be hauled, and \$11.15 if sold delivered.¹¹

In order to secure as high an income as possible from their farm woodland, farmers should cut and deliver their forestry products if they have the equipment and labor to do it with. Many operators will not have the facilities for delivering their forestry products but the majority can cut them during seasons of the year when they are not busy in their crops and place them in position for hauling, thereby doubling their gross income per acre over what it would be if the products were sold as stumpage.

Livestock

The reader should understand that the high livestock production rates associated with improved practices in the section that follow are dependent upon a level of management considerably above the average for this area at the present time. They are indicative, however, of what the good farm managers can do when they use the best known practices in producing feed and forage, feeding livestock, breeding livestock and in caring for livestock in general.

Milk Production. For minimum efficiency the herd should consist of not less than 5 to 10 cows. In order to maintain the herd in good condition about 20 percent of the cows should be sold each year and heifers brought into production to take their place. In order to insure good quality heifers the heifer calves from the highest producing cows should be kept each year; about 50 percent more heifer calves than needed for normal replacement would be kept in order to allow for loss and cullings for various reasons. Bull calves and the heifer calves, not kept for replacement, should be sold

¹¹Based upon the following estimated normal prices: Stumpage, sawlogs \$8.00; pulpwood \$2.00; fuel wood, \$0.50; cut and ready to be hauled, sawlogs, \$12.00; pulpwood, \$5.00; fuel wood, \$4.50; delivered, sawlogs, \$18.00; pulpwood, \$8.00; fuel wood, \$7.50.

when a few days old. Artificial insemination should be practiced not only because it improves herds but also because it is cheaper than maintaining a bull on the majority of dairy farms where milk is the major source of dairy income. Heifers should be bred when about two-thirds mature. Cows should be bred to

freshen in the fall in order to increase production during the winter months when prices are highest.

For efficient milk production maximum utilization of grazing crops is essential. The grazing program per cow as outlined in table 26 might consist of the following rotation:

| Crop | Acres | Grazing Period |
|--|-------|--------------------|
| Oats for grain (followed by lespedeza for hay) | 1.0 | Nov. - March |
| Oats and crimson clover | .5 | Nov. - May |
| Sudan or millet (following oats and clover) | (.5) | July - Sept. |
| Oats on permanent pasture | (.5) | Nov. - May |
| Permanent pasture | 2.0 | Apr. - Nov. |
| Total | 3.5 | Year-round grazing |

Grazing Sudan or millet in rotation with the permanent pasture takes the burden off the permanent pasture during the late summer drought and allows it to come back for early fall grazing. In addition to the grazing furnished, the acre of oats followed by lespedeza when fertilized and seeded according to recommendations will produce 30 to 40 bushels of oats and about 2 tons of hay. This is enough hay and more than enough oats^{1,2} to supply the cow's need for these items. In addition to furnishing grazing during the winter and early spring, the practice of seeding oats on one-half acre of permanent pasture per cow allows the renovation of all permanent pasture once each four years without additional cost.

In addition to the grazing described above, 1,400 pounds of grain, 600 pounds of cottonseed meal, two tons of hay, 25 pounds of minerals and 25 pounds of salt should be provided per cow in the herd. This feeding, breeding and culling

^{1,2}Dairy specialists recommend that oats constitute not more than 50 percent of the grain in the ration.

| Crop | Acres | Grazing Period | Grazed By |
|--|-------|--------------------|--------------|
| Oats for grain (followed by lespedeza for hay) | .5 | Nov. - March | Cow |
| Oats on permanent pasture | (.5) | Nov. - May | Cow |
| Oats or oats and crimson clover | 1.0 | Nov. - May | Calf |
| Sudan or millet (following oats and clover) | (.5) | July - Sept. | Cow and calf |
| Lepedeza for hay (following oats and clover) | (.5) | | |
| Permanent pasture | 2.0 | Apr. - Nov. | Cow and calf |
| Total | 3.5 | Year-round grazing | |

program, will produce an average of from 5,000 to 6,000 pounds of milk per cow.

Beef Production. Farms with a smaller capacity for cattle should be devoted to milk production in order to secure the highest income per cow instead of the highest income per day of work. In order to maintain a good herd of breeding cows about one-eighth of the herd should be replaced each year because of age or non-breeding. Replacement heifers should be produced by selecting those that showed the best development at about one year of age. Heifers should be bred when about two-thirds mature. One bull should be kept for each 25 to 30 cows.

Efficient beef production in this area is based entirely on pasture and forage crops. The grazing program per cow and calf unit would be similar to that outlined for the dairy cow, but it would be different in that only one-half acre of the oats would be harvested for grain. The grazing program as outlined in table 26 might consist of the following rotation:

With this grazing program the cows would be bred to drop calves in the early spring and good management would insure a 90 percent calf crop. The calves would remain with the cows until about

November 1, at which time they would be placed on one acre of oats or oats and crimson clover per calf. The calves would be removed from the oat pasture about June 1 and sold at weights aver-

Table 26. Recommended practices and estimated production¹ for major livestock enterprises adapted Newton County.²

| Item | Dairy cow ³ | Beef cow ⁴ | Sow ⁵ | Pullet laying flock ⁶ (100 birds) | Pullet production ⁷ (300 chicks) | Broiler production (2000 chicks) |
|-------------------------------|------------------------|-----------------------|--------------------|---|--|-------------------------------------|
| | pound | pound | pound | pound | pound | pound |
| Feeding program: | | | | | | |
| Grain | 1400 | ----- | 11300 | 3250 | 1000 | ----- |
| Protein supplement | 600 | ----- | 1300 | ----- | ----- | ----- |
| Commercial mix | ----- | ----- | ----- | 3250 | 3700 | 20000 |
| Total | 2000 | ----- | 12600 | 6500 | 4700 | 20000 |
| Hay | 4000 | 2000 | ----- | ----- | ----- | ----- |
| Minerals | 25 | 25 | 100 | ----- | ----- | ----- |
| Salt | 25 | 25 | 50 | ----- | ----- | ----- |
| Grazing program: | | | | | | |
| Production: | acres | acres | acres | acres | acres | acres |
| Permanent pasture | 2.00 | 2.00 | .50 | ----- | .50 | ----- |
| Summer crops | .50 | .50 | 1.00 | ----- | ----- | ----- |
| Winter and spring crops | 2.00 | 2.00 | 1.50 | ----- | ----- | ----- |
| Milk, lb. | 5500 | ----- | ----- | ----- | ----- | ----- |
| Meat, L.W. | 170 ⁸ | 640 ⁹ | 3150 ¹⁰ | 360 ¹¹ | 475 ¹² | 5000 ¹³ |
| Eggs, doz. | ----- | ----- | ----- | 1200 | ----- | ----- |
| Pullets, No. | ----- | ----- | ----- | ----- | 100 | ----- |

Source: Specialists of the Mississippi Experiment Station and Mississippi Extension Service.

¹Good management in all phases of production assumed.

²Each head of workstock would need about 1750 pounds of grain, 1 ton of hay, and 1.5 acres of permanent pasture.

³Grazing and roughage requirements include an allowance for the production of replacements needed to maintain the herd. In addition each heifer kept for replacement will need about 350 pounds of whole milk, 200 pounds of calf starter, 400 pounds of grain and 100 pounds of cottonseed up to one year of age; from one to two years of age each heifer will need about 200 pounds of grain and 300 pounds of cottonseed meal.

⁴Includes an allowance for the production of replacements needed to maintain the herd.

⁵Spring and fall litters averaging about 7 pigs raised per litter.

⁶One hundred pullets would be placed in the laying house about the first of September. Rigid culling would be practiced throughout the year; about 60 birds would be left in the flock the following August and all of these would be sold about the middle of August in order to clean up the laying house for a new flock of pullets. The mortality rate would average about 10 percent. The average number of birds in the flock would be about 80 for the year.

⁷Three hundred chicks would need to be started for each one hundred pullets put in the laying house in September. About one-half would be cockrels, the mortality rate would average about 10 percent and some pullets would not develop properly and would have to be culled.

⁸About twenty percent of the cows in the herd would be culled each year ($850 \times 20\% = 170$). In addition sales of bull calves and cull heifers would average about \$5 per cow with normal prices.

⁹About 500 pounds of calf and 140 pounds of cow. The calf crop would average ninety percent. Calf dropped in early spring, carried through the following winter on oat pasture and sold about the first of June weighing approximately 650 pounds. About 12.5 percent of cows in the herd would be culled each year.

¹⁰Fourteen hogs weighing 225 pounds each.

¹¹Ninety hens at four pounds each.

¹²About 135 cockrels weighing about 2.75 lbs. each and 30 cull pullets weighing about 3.5 lbs. each.

¹³About 1800 birds weighing from 2.5 to 3.0 pounds each.

aging approximately 650 pounds. With this grazing program, an average of not more than one ton of hay would be needed per cow unit to supply roughage, when unfavorable weather conditions reduce available grazing below the amount needed. Since this rotation of forage crops would produce about two tons of hay per cow, one ton would be available for sale or for feeding to other livestock.

Poultry Production. For minimum efficiency of production the laying flock should consist of not less than 200 pullets. The entire laying flock should be replaced each year by pullets because the first year production is 20 to 25 percent above the production of second or third year hens. Rigid culling should be practiced each month and for each 100 pullets placed in the laying house in September about 60 would remain in the flock the following August. These should be sold about the middle of August in order to clean up the laying house for the next flock of pullets. This management program is designed to increase production during the winter months when prices are highest. For each 100 pullets placed in the laying house the average number of layers for the year would be about 80. The rigid culling and good flock management should hold the mortality rate to not more than 10 percent.

For commercial production the laying flock should be confined to the laying house. Each hen should be fed about 3.5 pounds of grain and 3.5 pounds of commercial mix per month. This would average about 6,500 pounds per year for each 100 pullets started at the beginning of the laying year. With this feeding and culling program egg production for the average number of layers would be about 15 dozen per bird. This would total about 1,200 dozen for each 100 layers started in September.

Three hundred chicks should be started for each 100 pullets to be placed in the laying house in September. About 50 percent of the chicks will be cockrels and

even with good management the mortality rate will average about 10 percent. This will leave an average of from 125 to 135 pullets which should be culled to about 100 by removing those pullets that show the least development. The cockrels would be sold from 10 to 12 weeks of age at an average weight of about 2.5 to 3.0 pounds. About 3,800 pounds of starter and growing mash, 1,000 pounds of grain, and one-half acre of pasture¹³ will be required for each 100 pullets produced and ready for the laying house. In addition, about 135 cockrels and 30 cull pullets weighing a total of approximately 475 pounds will be sold.

Two thousand chicks should be the minimum size of the broiler enterprise and for efficient production three or four groups should be produced each year. With good management the mortality rate should not average more than 10 percent and feed consumed should not average over 4 pounds per pound of broilers sold. The broilers should be sold when weighing from 2.5 to 3.0 pounds and about 5,000 pounds of broilers should be sold for each 2,000 chicks started.

Pork Production For efficient production the hog enterprise should consist of not less than four sows producing two litters per year. The spring litter should be farrowed in March or April and sold in October or November under ordinary conditions; the fall litter should be farrowed in September or October and sold in April or May. Good management should insure the raising of seven pigs per litter and they should be fed out to weigh about 225 pounds per head.

Efficient pork production should be based on the maximum utilization of forage crops and hogging down corn when possible. The grazing and feeding program as outlined in table 26 would be as follows:

¹³ Rotate in order to control parasites and diseases.

| Maintenance of sow and pigs to weaning: | Date Utilized |
|--|---------------|
| 1. .25 acre of oats — sow | Nov.-March |
| 2. .25 acre of oats — sow and pigs to weaning | March-May |
| 3. .25 acre of permanent pasture — sow | May-Sept. |
| 4. .25 acre of permanent pasture — sow and pigs to weaning | Sept.-Nov. |
| 5. 2700 lbs. of grain and 300 lbs. of protein supplement | All year |
| Spring litter of pigs from weaning to sale: | |
| 1. .50 acre of oats (used by sow to May) | May-July |
| 2. 1 acre of sudan grass or soybeans | July-Sept. |
| 3. 1 acre of corn hogged down, 60 bu. (3360 lbs.) | Sept.-Nov. |
| 4. 800 lbs. of grain and 500 lbs. of protein supplement | May-Nov. |
| Fall litter of pigs from weaning to sale: | |
| 1. 1 acre of oats | Nov.-May |
| 2. About 4500 lbs. of grain and 500 lbs. of protein supplement | Nov.-May |

The above grazing program provides the sow at farrowing time with a pasture on which hogs have not been kept since it was plowed. This is essential for the production of healthy pigs. Moreover, all fields grazed by hogs should be rotated with other crops in order to control parasites and diseases.

With the maximum utilization of forage as provided by the above rotation of

grazing crops, concentrates consumed per 100 pounds of gain from weaning to sale should average about 350 pounds for the spring litter and 360 pounds for the fall litter. The fall litter would require slightly more feed than the spring litter because of less favorable conditions. In all, total concentrates required per one hundred pounds of pork produced, including that required to maintain the sow, would average about 400 pounds.

SUGGESTED REORGANIZATION OF TYPICAL FARMS

Suggested systems of farming will be shown only for the 40, 80, 160 and 360 acre typical farm units. Farmers having 60 acres, 120 acres, 240 acres or some other acreage can make adjustments in the systems suggested to fit their individual situation. Many operators having the same total acreage as the four typical units shown will need to make adjustments in the suggested systems because of differences in the proportion of the land suited to crops and open pasture on individual units. For example, the operator of an individual 80-acre farm unit may have enough land suited to crops and open pasture to increase his dairy herd by two over that suggested for the typical 80-acre farm.

The suggested systems of farming that follow are based upon the yield level as-

sociated with the improved practices discussed in the preceding section. Correct land utilization is essential to this high yield level. It is estimated that not more than 20 to 25 percent of the land in the Sand-Clay Hills section of this county should be planted to row crops, 35 to 40 percent in close-growing and sod crops and the balance in woods. This breakdown of the proportion of the land suited to each of the major uses will be closely adhered to in determining the systems of farming suggested for the four typical farm units.

Above-average management will be required to carry out these intensive systems of farming, which require the use of several times as much capital on the same acreage as formerly. Farmers lacking in background and in knowledge of

scientific agriculture can shift to these intensive systems of farming if they are able to follow instructions closely and are willing to move into the program over a period of years rather than try to make all the changes at once. Under no circumstances should any farmer attempt to shift to one of these intensive systems of farming unless he intends to carry out all details in the order in which they should occur. For example, the winter grazing program can be ruined if the oats are planted too late or improperly fertilized. The same applies to other crops and to livestock feeding and breeding. Intensive farming carried out in a haphazard manner can lead to financial ruin.

The present agricultural educational program in all its various aspects will have to be expanded and intensified if the majority of farmers are to obtain the managerial "know how" necessary to operate an intensive system of farming within a reasonable number of years.

Inadequate credit is a second major obstacle to shifting to more intensive systems of farming. The majority of farmers will have neither the capital nor the financial backing required to borrow the amount of capital needed to make all of the suggested changes in one year. Therefore, it will be necessary for most farmers to grow into the revised system of farming over a period of 5 to 10 years depending on the number of changes required and the extent to which capital for changes is available. This initial lack of full capital backing will probably be to the advantage of most farmers in that they can acquire the managerial "know how" necessary to operate these intensive systems of farming over a period of years as they make changes from year to year until the revised system is in operation. Only those farmers who are above average managers and have surplus capital or financial backing under reasonable conditions as to rates of interest and time

of repayment should attempt to shift to one of these intensive systems in a short period of time.

The other major obstacle to shifting to more intensive systems of farming is inadequate market outlets. Cotton is the only crop for which all farmers are assured a ready market. Relatively good markets are available for cattle and hogs. Farmers not on milk routes will find that the milk companies will extend milk routes, if they and their neighbors will produce a reasonable volume of milk. Market outlets for poultry products are less certain and will have to be developed. A few poultry farms around each of the towns can supply local needs for eggs and poultry meat. However, the county is well situated with regard to three of the largest cities in the state—Jackson, Meridian and Laurel, and good market outlets could be developed in these cities over a period of years either cooperatively or privately. As a cash crop, sweetpotatoes offer more income per acre than cotton; however, market outlets are less certain. A few farms can supply local needs and enough commercial areas are already established to supply the present demand in city markets. Truck crops have possibilities on the small farms in this area; but at the present time, the profitable production of truck crops on more than a few farms is questionable because of the small local demand and the competition from established areas. Additional research by production and marketing specialists will be necessary before the place of truck crops in the farming pattern in this area can be determined. In producing any new commodity for market, the individual farmer should start on a small scale and gradually expand, and under no conditions should he attempt to produce more than he feels that he can dispose of at a profitable price.

The less complex changes such as using more fertilizer and better seed for row crops should be carried out first because

they are easy to initiate and there is a quick return on the capital invested. If borrowed, this capital can be repaid in less than a year. The addition or expanding of livestock enterprises and the grazing and feed crops they are dependent upon should be started later and expanded to the desired size over a period of years.

Efficient systems of farming for the various sizes of farm units can be outlined in specific terms only when some assumption is made concerning the amount of labor available in the average farm family. For the purposes of this study, it is assumed that the total family labor available, including the operator will amount to 1.4 man equivalent when children are in school and 2.0 man equivalent when children are out of school.¹⁴ Twelve hours a day is taken as the maximum number of hours to be worked per man on field crops and livestock on days suitable for field work during peak seasons.

Normal price and cost figures are used in estimating investment and income for the suggested systems of farming and for the farm units as operated in 1946. The use of normal prices instead of inflated prices prevents overestimating farm income from the suggested systems of farming at the time reorganization would be completed several years from now on most farms making the shift. The use of the same prices for the farm units as operated in 1946 facilitates the evaluation of the effectiveness of the suggested systems of farming. See Appendix Table 1 for the normal prices used in this study.

Typical 40-Acre Farm

In 1946 the typical 40-acre farm in Newton County was operated by one family with two mules. The cropping pattern consisted of 5 acres of cotton, 10 acres of corn, 1 acre of hay and 2 acres of miscellaneous truck and garden

crops. Two acres of cropland was idle. The livestock program included one milk cow, 25 hens and 3 pigs. Total investment in farm property amounted to \$1,400, of which 77 percent was invested in real estate (table 27).

This system of farming gave cash receipts of \$250 of which 82 percent came from the sale of cotton and cottonseed. One calf, a few eggs and chickens and a small amount of forestry products constituted the balance of sales. Deducting \$180 cash expenses left \$70 net cash income to apply on depreciation, pay interest on borrowed money and to spend on family living. Farm products valued at \$340 were consumed by the farm family. When the value of these products were added to the net cash income and depreciation and interest on investment deducted, family labor earnings of \$290 were obtained. On this size farm the average family labor force was unemployed much of the time and only worked a total of about 1,650 hours during the year (Appendix table 2). Earnings per hour of labor amounted to 18 cents.

Reorganization Plan 1. Under this plan, the acres of cropland would be cut from 20 to 15 and the acres of open pasture increased from 6 to 10. Acres in woodland would be increased from 12 to 13. Five acres of cotton would be grown, the same as in 1946, in order to maximize income from a relatively small acreage of cropland. The corn acreage would be cut from 10 to 3 acres and by the use of improved practices as much corn would be produced on the three acres as was formerly produced on 10. Four acres of oats for grain and grazing, 2 acres of oats and crimson clover for grazing, 2.5 acres of oats seeded on permanent pasture for winter grazing, 4.5 acres of lespedeza for hay, 1.5 acres of Sudan or millet for temporary summer grazing and 1 acre of garden, small fruit and truck crops would make up the balance of the cropping pattern.

¹⁴The school term for country schools is taken to be September 15, to May 15.

Table 27. Farm organization and financial summary of a typical 40-acre farm, with suggested reorganization, Newton County, Mississippi.

| Item | 1946 operation | Plan 1 | Plan 2 | Plan 3 |
|--|-------------------|-----------|-----------|-----------|
| Land use: | acres | acres | acres | acres |
| Cropland | 20 | 15 | 15 | 15 |
| Open pasture | 6 | 10 | 10 | 10 |
| Woodland pasture | 11 | --- | --- | --- |
| Woodland | 1 | 13 | 13 | 13 |
| Farmstead, roads, etc. | 2 | 2 | 2 | 2 |
| Crops: | | | | |
| Cotton | 5 | 5 | 5 | 5 |
| Corn | 10 | 3 | 3 | 3 |
| Oats, grain and grazing | --- | 4 | 4 | 4 |
| Oats and crimson clover for grazing | --- | 2 | 2 | 2 |
| Oats seeded on permanent pasture | --- | (2.5) | (2.5) | (2.5) |
| Lespedeza for hay | 1 ¹ | (4.5) | (4.5) | (4.5) |
| Sudan grass or millet for grazing | --- | (1.5) | (1.5) | (1.5) |
| Garden and truck | 2 | 1 | 1 | 1 |
| Idle | 2 | --- | --- | --- |
| Livestock: | number | number | number | number |
| Workstock | 2 | 1 | 1 | 1 |
| Milk cows | 1 | 4 | 4 | 4 |
| Pigs raised | 3 | 3 | 3 | 3 |
| Hens | 25 | 25 | 500 | 25 |
| Chickens raised | 25 | 50 | 1350 | 7200 |
| Value of farm property: | dollars | dollars | dollars | dollars |
| Land | 660 | 800 | 800 | 800 |
| Buildings and fences ² | 415 | 700 | 1300 | 1300 |
| Machinery ² | 100 | 75 | 175 | 175 |
| Livestock | 225 | 450 | 925 | 450 |
| Total | 1400 | 2025 | 3200 | 2725 |
| Cash receipts: | | | | |
| Cotton | 205 | 430 | 430 | 430 |
| Dairy enterprise | 20 | 525 | 525 | 525 |
| Poultry enterprise | 15 | 15 | 2330 | 4600 |
| Miscellaneous | 10 | 10 | --- | --- |
| Total | 250 | 980 | 3285 | 5555 |
| Cash expenses | | | | |
| Fertilizer and lime | 60 | 275 | 275 | 275 |
| Feed | 30 | 80 | 1495 | 2470 |
| Seed | 10 | 60 | 60 | 60 |
| Custom work ³ | 15 | 110 | 165 | 110 |
| Taxes and insurance | 10 | 20 | 30 | 30 |
| Repairs ⁴ | 30 | 50 | 70 | 70 |
| Pigs and chickens purchased | 10 | 10 | 130 | 650 |
| Veterinarian, medicine and breeding fees | --- | 25 | 45 | 105 |
| Marketing costs | --- | 55 | 155 | 155 |
| Miscellaneous | 15 | 35 | 125 | 200 |
| Total | 180 | 720 | 2550 | 4125 |
| Net cash income | 70 | 260 | 735 | 1430 |
| Value of farm products used by family | 340 | 590 | 590 | 590 |
| Depreciation | 50 | 50 | 100 | 100 |
| Net farm income ⁶ | 360 | 800 | 1225 | 1920 |
| Interest on investment | 70 | 100 | 160 | 140 |
| Family labor earnings ⁷ | 290 | 700 | 1065 | 1780 |

¹Clover or soybeans.

²Inventory values shown at one-half of new cost.

³Ginning, combining oats and land preparation and grinding feed.

⁴Buildings, fences and equipment.

⁵Includes milk hauling, auction charges and other marketing costs.

⁶Net cash income plus the value of farm products used by the family minus depreciation.

⁷Net farm income minus interest on investment.

The livestock program would include 4 milk cows from which milk for manufacturing purposes would be sold. Twenty-five hens would be kept for egg production for home use and enough chickens raised to provide the family with poultry meat and to furnish replacements. Three pigs would be purchased and fed out for home use. The poultry and hog enterprise would be handled in the same manner as in 1946 because they would not be big enough for it to be economical to apply improved practices.

It would be cheaper to hire the following jobs done than to own the machines and power necessary to do them: Land preparation for oats, combining oats, hauling cotton, mowing hay and raking hay. When these jobs are done on a custom basis, one mule will furnish sufficient power to operate this farm. A one-horse wagon could be used for on-the-farm hauling. Other field equipment needed would include a turning plow, planter, two or three cultivating plows and miscellaneous tools such as hoes, forks, etc. This method and system of farming would require a total of approximately 1,950 hours of labor during the year, about the amount needed to keep one man busy two-thirds of the year.

Production of an adequate amount of food for the farm family is an important part of any farm plan and this is especially true for small farms. This farm plan provides for the production of and use on the farm of the following amounts of the various farm commodities: Milk, one and one-half gallons per day; eggs, 3 dozen per week; chickens, one per week; 3 hogs weighing 250 pounds each on foot; one calf weighing about 400 pounds on foot; corn for meal, 10 bushels; garden, small fruits and miscellaneous truck crops, 1 acre; and about 10 to 12 cords of wood for fuel. The value of these products would amount to about \$590 based on farm prices.

Total investment would amount to approximately \$2,000, and about 40 percent

more than in 1946. Cash receipts would total about \$980, of which approximately 54 percent would come from the dairy enterprise and 44 percent from the cotton enterprise. Cash expenses would amount to about \$720 of which \$275 or almost 40 percent of the total would be for fertilizer. After deduction of cash expenses the net cash income would amount to \$260. Family labor earnings would amount to about \$700 and earning per hour of family labor approximately 36 cents.

Even when farmed according to the best known methods, the 40-acre farm is too small to provide the average farm family with an adequate income if commercial production is limited to those products that are usually produced commercially in this area. Plan one was set up as a cotton and dairy farm. These are the two most important sources of income in the county at this time. The net cash income that this system of farming gives on a 40-acre farm of \$260 is clearly inadequate for even a minimum standard of living for the average farm family. For those families who feel the need for additional income above that offered in Plan 1 and who do not mind additional work Plans 2 and 3 are suggested. These plans include the addition as a third major source of income an enterprise that is produced primarily for home use at the present time on practically all farms in this area.

Reorganization Plan 2. This is the same as Plan 1 except that a poultry enterprise of 500 laying hens is added. All of the feed, including the grains, for the poultry enterprise would be purchased. The addition of this enterprise would increase the amount of work performed by the farm family to about 2,950 hours. Total investment would be increased to \$3,200. Cash receipts would amount to about \$3285 of which approximately 71 percent would come from the major enterprise, poultry. The balance would come from the dairy enterprise and cotton.

Table 28. Farm organization and financial summary of a typical 80-acre farm, with suggested reorganization, Newton County, Mississippi.

| Item | 1946 operation | Plan 1 | Plan 2 |
|---|-------------------|-----------|-----------|
| Land use: | acres | acres | acres |
| Cropland | 32 | 26 | 28 |
| Open pasture | 22 | 24 | 20 |
| Woodland pasture | 16 | --- | --- |
| Woodland | 8 | 28 | 30 |
| Farmstead, road, etc. | 2 | 2 | 2 |
| Crops: | | | |
| Cotton | 6 | 5 | 5 |
| Corn | 15 | 5 | 10 |
| Oats, grain and grazing | --- | 10 | 8 |
| Oats and crimson clover, grazing | --- | 5 | 4 |
| Oats on permanent pasture | --- | (6) | (5) |
| Lespedeza hay | 2 ¹ | (11) | (9) |
| Sudan grass or millet | --- | (4) | (3) |
| Garden and truck | 3 | 1 | 1 |
| Idle | 6 | --- | --- |
| Livestock: | number | number | number |
| Workstock | 2 | 2 | 2 |
| Milk cows | 3 | 10 | 8 |
| Pigs raised | 4 | 5 | 3 |
| Hens | 40 | 40 | 500 |
| Chickens raised | 75 | 75 | 1350 |
| Value of farm property: | dollars | dollars | dollars |
| Land | 1240 | 1500 | 1500 |
| Buildings and fences ² | 600 | 1100 | 1500 |
| Machinery ² | 115 | 300 | 400 |
| Livestock | 430 | 950 | 1250 |
| Total | 2385 | 3850 | 4650 |
| Cash receipts: | | | |
| Cotton | 245 | 430 | 430 |
| Dairy enterprise | 60 | 1525 | 1190 |
| Poultry enterprise | 50 | 50 | 2330 |
| Miscellaneous | 40 | 75 | 20 |
| Total | 395 | 2080 | 3970 |
| Farm expenses: | | | |
| Fertilizer and lime | 100 | 530 | 520 |
| Feed | 45 | 165 | 1170 |
| Seed | 15 | 130 | 115 |
| Custom work ³ | 15 | 90 | 125 |
| Taxes and insurance | 20 | 40 | 50 |
| Repairs ⁴ | 40 | 100 | 140 |
| Pigs and chickens purchased | --- | 20 | 130 |
| Veterinarian, medicine, breeding fees | --- | 60 | 70 |
| Marketing costs ⁵ | --- | 160 | 225 |
| Miscellaneous | 25 | 65 | 125 |
| Total | 260 | 1360 | 2670 |
| Net cash income | 135 | 720 | 1300 |
| Value of farm products used by family | 400 | 590 | 590 |
| Depreciation | 60 | 105 | 145 |
| Net farm income ⁶ | 475 | 1205 | 1745 |
| Interest on investment | 120 | 190 | 230 |
| Family labor earnings ⁷ | 355 | 1015 | 1515 |

¹ Clover or soybeans.

² Inventory values shown at one-half of new cost.

³ Ginning, combining oats, milk hauling and grinding feed.

⁴ Buildings, fences and equipment.

⁵ Includes milk hauling, auction charges and other marketing costs.

⁶ Net cash income plus the value of farm products used for the family minus depreciation.

⁷ Net farm income minus interest on investment.

Cash expenses would total about \$2,550, of which approximately \$1,500 would be for feed, most of which would be for the poultry enterprise. Net cash income would amount to about \$735, family labor earnings \$1,065, and earnings per hour of labor approximately 36 cents.

Reorganization Plan 3. This is the same as Plan 1 except that a broiler enterprise of 2,000 birds every three months is added. All feed for the broiler enterprise would be purchased. The addition of this enterprise would increase the amount of work performed by the farm family to approximately 3,400 hours, which is more than twice as much work as was performed on the typical 40-acre farm in 1946. Even with this increase in the amount of work performed, the average family labor force would not be fully utilized a single month during the year.

Total investment would amount to \$2,725, cash receipts would total about \$5,555, of which more than 80 percent would come from the main enterprise, broilers. Cash expenses would total about \$4,125, of which about \$3,000 would be for feed and chickens for the broiler enterprise. Deducting cash expenses from cash receipts leaves about \$1,430 net cash income to apply on depreciation, interest on production credit, debts incurred for buildings and equipment, and family living expenses. Family labor earnings would amount to approximately \$1,780 and earnings per hour of family labor would approximate 50 cents.

Typical 80-Acre Farm

In 1946, the typical 80-acre farm in Newton County had 32 acres of cropland and 22 acres of open pasture (table 28). Of the cropland, 6 acres was planted to cotton, 15 acres to corn, 2 acres to hay, 3 acres to miscellaneous truck crops and garden, and 6 acres were idle. It was operated by one family with two mules. The livestock consisted of 3 cows, 40 hens and 4 pigs. This system of farming required about 2,350 hours of family

labor during the year, and the average family labor force was fully employed on days fit for field work only one month—April.

Investment in farm property amounted to \$2,385, of which about three-fourths was invested in real estate. Cash receipts totaled \$395, of which 62 percent was from cotton. Cash expenses amounted to \$260 and net cash income \$135. Family labor earnings were \$355 and earnings per hour of labor 15 cents.

Reorganization Plan 1. Under this plan the acreage of cropland would be cut from 32 to 26 acres, the acres of open pasture increased from 22 to 24 acres and the acres of woodland increased from 24 to 28 acres. Five acres of cotton would be grown as a cash crop. The balance of the cropping system would consist of 5 acres of corn, 10 acres of oats for grain and grazing, 5 acres of oats and crimson clover for grazing, 6 acres of oats on permanent pasture, 4 acres of Sudan grass or millet for temporary summer grazing, 11 acres of lespedeza for hay and 1 acre of miscellaneous truck, small fruits and garden crops.

Dairying would be the major livestock enterprise; 10 cows would be kept and milk sold for manufacturing purposes. The poultry and hog enterprises would be primarily for home use, and they would be handled in the same manner as in 1946 because they would not be large enough for the application of improved practices.

One family with two mules would be able to operate this farm without hiring additional help. Field equipment needed to operate this farm would include one wagon, 2 turning plows, one middlebuster, one disc, one harow, one planter, one fertilizer distributor, 3 half-row cultivators, one full-row cultivator, one mowing machine, one hay rake, and a number of miscellaneous small tools. Combining oats on a custom basis would be the only work hired. Cows would be milked by

Table 29. Farm organization and financial summary of a typical 160-acre farm, with suggested reorganization, Newton County, Mississippi.

| Item | 1946 operation | Plan 1 | Plan 2 |
|--|-------------------|-----------|-----------|
| Land use: | acres | acres | acres |
| Cropland | 54 | 48 | 49 |
| Open pasture | 16 | 48 | 48 |
| Woodland pasture | 59 | — | — |
| Woodland | 25 | 58 | 57 |
| Farmstead, roads, etc. | 6 | 6 | 6 |
| Crops: | | | |
| Cotton | 11 | 5 | — |
| Corn | 22 | 6 | 12 |
| Oats, grain and grazing | — | 24 | 24 |
| Oats and crimson clover grazing | — | 12 | 12 |
| Oats on permanent pasture | — | (12) | (12) |
| Lespedeza hay | 3 ¹ | (24) | (24) |
| Temporary summer grazing | — | (12) | (12) |
| Garden and truck | 3 | 1 | 1 |
| Idle | 15 | — | — |
| Livestock: | number | number | number |
| Workstock | 3 | — | — |
| Milk cows | 4 | 24 | 24 |
| Pigs raised | 4 | 3 | 3 |
| Hens | 45 | 45 | 500 |
| Chickens raised | 75 | 75 | 1350 |
| Value of farm property: | dollars | dollars | dollars |
| Land | 2300 | 2750 | 2750 |
| Buildings and fences ² | 300 | 2250 | 2750 |
| Machinery ² | 150 | 1900 | 2000 |
| Livestock | 550 | 1850 | 2350 |
| Total | 3900 | 8750 | 9850 |
| Cash receipts: | | | |
| Cotton | 450 | 430 | — |
| Dairy enterprise | 80 | 5130 | 5130 |
| Poultry enterprise | 50 | 50 | 2330 |
| Other | 150 | 40 | 40 |
| Total | 730 | 5650 | 7500 |
| Cash expenses: | | | |
| Fertilizer and lime | 150 | 1040 | 1040 |
| Feed | 50 | 370 | 1410 |
| Seed | 20 | 90 | 90 |
| Custom work ³ | 30 | 150 | 120 |
| Hired labor | 10 | 30 | — |
| Taxes and insurance | 30 | 100 | 110 |
| Repairs ⁴ | 60 | 330 | 380 |
| Pigs and chickens purchased | — | 10 | 130 |
| Veterinarian, medicine and breeding fees | — | 140 | 160 |
| Marketing costs ⁵ | — | 400 | 500 |
| Tractor fuel | — | 180 | 190 |
| Miscellaneous | 40 | 150 | 200 |
| Total | 390 | 2990 | 4330 |
| Net cash income | 340 | 2660 | 3170 |
| Value of farm products used by family | 460 | 590 | 590 |
| Depreciation | 85 | 400 | 450 |
| Net farm income ⁶ | 715 | 2850 | 3310 |
| Interest on investment | 195 | 440 | 495 |
| Family labor earnings ⁷ | 520 | 2410 | 2815 |

¹ Clover or soybeans.

² Inventory values shown at one-half of new cost.

³ Includes milk hauling, auction charges and other marketing costs.

⁴ Net cash income plus the value of farm products used by the family minus depreciation.

⁵ Net farm income minus interest on investment.

⁶ Ginning and baling hay.

⁷ Buildings, fences and equipment

hand. In all, the family labor force would work about 3,450 hours.

Total investment in farm property would amount to approximately \$3,850, about \$1,500 more than in 1946. Cash receipts would amount to about \$2,080 of which about 73 percent would come from the main enterprise, dairying. Cotton would contribute about 20 percent. The balance would come from the poultry, hog and forestry enterprises. Cash expenses would total about \$1,360 of which approximately 40 percent would be for fertilizer. Net cash income would amount to about \$720, family labor earnings \$1,015, and earnings per hour of labor approximately 30 cents.

This size and system of farming produces sufficient income for a minimum standard of living for the average farm family. However, for those families who are not satisfied with a minimum standard of living and who do not mind the additional work and risk involved, Plan 2 is suggested. Plan 2 includes the addition of a laying flock as the most important source of cash income.

Reorganization Plan 2. This differs from Plan 1 in the following manner: First a poultry enterprise of 500 hens is added and the acreage of corn increased from 5 to 10 in order to provide the grain needed to feed them. Second, the number of dairy cows is reduced from 10 to 8 and the acreage of forage and pasture crops decreased accordingly in order to release the cropland needed for the increased acreage of corn. These changes would increase the amount of work performed by the farm family to approximately 4,100 hours during the year; and the average family labor force would be fully utilized on days fit for field work in March, September, October and November.

Total investment in farm property would amount to about \$4,650. Cash receipts would total about \$3,970, of which approximately 59 percent would be from poultry and 30 percent from dairying.

Cash expenses would amount to about \$2,670, of which about 44 percent would be for feed, primarily laying mash. Fertilizer would account for an additional 20 percent. Net cash income would amount to about \$1,300, family labor earnings \$1,515, and earnings per hour of family labor about 37 cents.

Typical 160-Acre Farm

In 1946, the typical 160-acre farm in Newton County had 54 acres of cropland and 14 acres of open pasture (table 29). Eleven acres of cropland were planted to cotton, 22 acres to corn, 3 acres to hay, 3 acres to miscellaneous truck and garden crops and 15 acres were idle. The livestock program consisted of 4 cows, 45 hens and 4 pigs. This farm was operated by one family with 3 mules. This system of farming required about 3,200 hours of family labor, and the average family labor force was fully utilized on days fit for field work in March, April, May and June.

Total investment in farm property amounted to \$3,900 of which \$3,200 was in land and buildings. Cash receipts totaled \$730; cotton contributed about 62 percent of this total. Cash expenses amounted to \$390 and net cash income \$340. Family labor earnings were \$520 and earnings per hour of family labor 16 cents.

Reorganization Plan 1. Under this plan the acres of cropland would be cut from 54 to 48, the acres of open pasture increased from 16 to 48, and the acres of woodland cut from 84 to 58. This would involve clearing of 26 acres of woodland pasture. Five acres of cotton would be grown as a cash crop. The balance of the cropping system would consist of 6 acres of corn, 24 acres of oats for grain and grazing, 12 acres of oats and crimson clover for grazing, 12 acres of oats on permanent pasture, 24 acres of lespedeza hay, 12 acres of Sudan or millet lespedeza for temporary summer grazing, and 1 acre of miscellaneous truck, small fruit and garden crops.

Table 30. Farm organization and financial summary of a typical 360-acre farm with suggested reorganization, Newton County, Mississippi.

| Item | 1946 operation | Plan 1 | Plan 2 |
|---|-------------------|-----------|-----------|
| Land use: | acres | acres | acres |
| Cropland | 115 | 112 | 100 |
| Open pasture | 60 | 104 | 100 |
| Woodland pasture | 85 | — | — |
| Woodland | 90 | 134 | 150 |
| Farmstead, roads, etc. | 10 | 10 | 10 |
| Crops: | | | |
| Cotton | 16 | — | 10 |
| Corn | 45 | 24 | 13 |
| Oats, grain and grazing | — | 25 | 50 |
| Oats or oats and crimson clover | — | 62 | 25 |
| Oats on permanent pasture | — | (25) | (25) |
| Lespedeza, hay | 10 ¹ | (54) | (50) |
| Temporary summer pasture | — | (33) | (25) |
| Garden and truck | 4 | 1 | 2 |
| Idle | 40 | — | — |
| Livestock: | number | number | number |
| Workstock | 4 | — | — |
| Cows | 20 | 50 | 50 |
| Pigs raised | 7 | 112 | 3 |
| Hens | 50 | 50 | 50 |
| Chickens raised | 75 | 75 | 75 |
| Value of farm property: | dollars | dollars | dollars |
| Land | 5350 | 6400 | 6400 |
| Buildings and fences ² | 1800 | 2500 | 3800 |
| Machinery ² | 1900 | 2900 | 3600 |
| Livestock | 1550 | 4200 | 3800 |
| Total | 9600 | 16000 | 17600 |
| Cash receipts: | | | |
| Cotton | 660 | — | 860 |
| Beef or dairy enterprise | 400 | 2950 | 10,010 |
| Hog enterprise | 70 | 2680 | — |
| Other | 360 | 1040 | 270 |
| Total | 1490 | 6670 | 11,140 |
| Cash expenses: | | | |
| Fertilizer and lime | 250 | 2300 | 2080 |
| Feed | 90 | 300 | 1560 |
| Seed | 40 | 120 | 180 |
| Hired labor ³ | 310 | 40 | 630 |
| Taxes and insurance | 110 | 200 | 240 |
| Repairs ⁴ | 150 | 430 | 590 |
| Veterinarian, medicine, and breeding fees | — | 60 | 290 |
| Ginning | 40 | — | 60 |
| Marketing costs ⁵ | 20 | 280 | 840 |
| Tractor fuel | 30 | 280 | 300 |
| Interest | 25 | 140 | 100 |
| Miscellaneous | 50 | 250 | 330 |
| Total | 1115 | 4400 | 7200 |
| Net cash income | 375 | 2270 | 3940 |
| Value of farm products used by the family | 510 | 590 | 590 |
| Depreciation | 275 | 590 | 750 |
| Net farm income ⁶ | 610 | 2270 | 3780 |
| Interest on investment | 480 | 800 | 865 |
| Family labor earnings ⁷ | 130 | 1470 | 2915 |

¹ Clover or soybeans.

² Inventory of values shown at one-half of new cost.

³ Includes cost of cropper labor in 1946.

⁴ Buildings, fences and equipment.

⁵ Includes auction charges, milk hauling and other marketing costs.

⁶ Net cash income plus the value of farm products.

⁷ Net farm income minus interest on investment.

Dairying would be the major enterprise; 24 cows would be kept for Grade A milk production. The hog and poultry enterprises would be about the same size as in 1946 and would be primarily for home consumption; they would be handled in the same manner as in 1946 because their small size would make improved practices uneconomical.

One family of average size with a single one-plow (one-row) tractor and no workstock would be able to operate this system of farming without hiring additional help, except for a small amount of cotton picking. The tractor would be rubber mounted and have a road gear to meet hauling and odd job needs. Tractor equipment that could be used to advantage is as follows: stalk cutter, breaking plow, middlebuster, disc harrow, section harrow, planter-distributor, grain drill and attachments, cultivator, mower, rake, combine and attachments, trailer and hammer mill. It would be cheaper to hire hay baled on this farm than to own a baler. The cows would be milked by machine in order to keep labor requirements within the limits of the typical family labor force. In all the family labor force would work about 4,800 hours, and the average family labor force would be fully utilized on days fit for field work in September, October and November.

Total investment in farm property would amount to approximately \$8,750, more than twice as much as in 1946. Cash receipts would amount to about \$5,650, of which about 90 percent would come from the main enterprise, dairying. Cotton would contribute most of the balance. Cash expenses would total about \$2,990, of which approximately one-third would be for fertilizer. Feed for the dairy cattle and milk hauling would be the next most important item of expense. Net cash income would amount to about \$2,660, family labor earnings \$2,410, and returns per hour of labor approximately 50 cents.

Reorganization Plan 2. This is the same as Plan 1 except that a poultry enterprise of 500 hens is added, the acreage of corn increased from 6 to 12, and the production of cotton discontinued. The shift in land from cotton to corn was made in order to produce the extra grain needed for the poultry enterprise. This change in the system of farming would increase the amount of work performed by the farm family to approximately 5,400 hours; the typical family labor force would be fully utilized on days fit for field work in March, April, October and November.

Total investment in farm property would be increased to about \$9,850, approximately \$5,800 more than in 1946. Cash receipts would total about \$7,500 of which approximately two-thirds would be from the dairy enterprise and one-third from the poultry enterprise. Cash expenses would amount to about \$4,330 of which approximately \$2,500 would be for fertilizer and feed. Net cash income would amount to about \$3,170, family labor earnings \$2,815 and earnings per hour of family labor approximately 53 cents.

Typical 360-Acre Farm

In 1946, the typical 360-acre farm in Newton County had 115 acres of cropland and 60 acres of open pasture (table 30). Of the cropland, 16 acres were planted to cotton, 45 acres to corn, 10 acres to hay, 4 acres to miscellaneous truck and garden crops, and 40 acres were idle. The livestock program consisted of 20 cows for beef production, 1 sow and 50 hens. The labor force on this farm included the owner and two cropper families. It was operated with 4 mules and one medium-sized tractor. The tractor was used primarily for land preparation—breaking. Planting and cultivating were done with mules. The operator and his family worked a total of approximately 2,700 hours and the oper-

ator's family force was fully utilized on days fit for field work in March, October, and November.

Total investment in farm property amounted to \$9,600 of which \$7,150 was invested in real estate. Cash receipts totaled \$1,490. Cotton accounted for 44 percent of this total and the beef enterprise for 27 percent. Cash expenses amounted to \$1,115, net cash income \$375, family labor earnings \$130 and earnings per hour of family labor 5 cents. Earnings on this farm were lower than on smaller sized farms because of the larger investment and the more inefficient use of resources.

Reorganization Plan 1. Under this plan the acres of cropland would be cut from 115 to 112, the acres of open pasture increased from 60 to 104 and the acres of woodland cut from 175 to 134. This would involve the clearing of 41 acres of woodland pasture. All of the cropland except 1 acre for miscellaneous truck, small fruit and garden crops would be used for feed crops. Cotton production would be eliminated from the farming system. The cropping pattern would consist of 24 acres of corn, 25 acres of oats for grain and grazing, 62 acres of oats or oats and crimson clover, 25 acres of oats on permanent pasture, 54 acres of lespedeza hay and 33 acres of temporary summer grazing (Sudan, millet or lespedeza).

Beef and pork production would be the major livestock enterprises. Fifty cows and eight sows would be kept. One or two of the cows would be milked for home consumption. The poultry enterprise would be about the same size as in 1946 and would be handled in about the same manner.

One family of average size with one two-plow (two-row) tractor and no workstock would be able to operate a farm following this system without hiring additional help except a small amount in the hay and corn harvesting seasons. The tractor would be rubber mounted and have a road gear to meet hauling

and odd job needs. Tractor equipment that could be used to advantage is as follows: Stalk cutter, breaking plow, middlebuster, disc harrow, section harrow, planter, distributor, grain drill and attachments, cultivator, mower, rake, pickup hay baler, combine and attachments and trailer. In all the family labor force would work about 4,000 hours; the average family labor force would be fully utilized on days fit for field work in March, October and November.

Total investment in farm property would amount to about \$16,000, approximately \$6,000 more than in 1946. Cash receipts would total about \$6,670 of which approximately 44 percent would be from the beef enterprise and 40 percent from the pork enterprise. Hay and forestry products would contribute most of the balance. The cost of fertilizer would amount to about \$2,300, slightly more than half of the total cash expenses of approximately \$4,400. Net cash income would amount to about \$2,270, family labor earnings \$1,470 and earnings per hour of family labor approximately 37 cents.

Reorganization Plan 2. This would differ from Plan 1 in the following manner: First, a dairy herd of 50 cows for Grade A milk production would replace the 50 beef cows and 8 brood sows; pork and poultry production would be primarily for home use. Second, a fulltime wage hand would be employed in order to have sufficient labor to take care of a dairy herd of this size. Third, 10 acres of cotton would be planted in order to give the wage worker's family employment and to utilize the surplus labor of the operator's family in hoeing and picking the crop. Fourth, the production of feed crops would be changed to meet the requirements for the new livestock program. Additional equipment would include a hammer mill, four single-unit milking machines and other necessary dairy equipment. These changes in the system of farming would increase the amount of work performed by the farm family and

the full-time wage hand to approximately 8,650 hours; the operator's family labor force would be fully utilized on field crops and livestock on days available for field work in the fall months—September, October and November.

Total investment in farm property would amount to about \$17,600. Cash receipts would total about \$11,140, of which all except approximately \$1,100 would come from the dairy enterprise. Cotton and forestry products would contribute practically all of this. Cash expenses

would total about \$7,200; of this total, fertilizer would contribute about 29 percent, feed 22 percent, marketing cost 12 percent and labor 9 percent. Deducting cash expenses from cash receipts leaves about \$3,940 net cash income to apply on depreciation, interest on production credit, debts for capital improvement and family living expenses. Family labor earnings would amount to about \$2,915 and earnings per hour of work performed by the regular labor force (including the regular wage hand) would be approximately 39 cents.

SUMMARY

With present methods and systems of farming the majority of farms in Newton County are too small to utilize modern equipment efficiently, to employ labor throughout the year and to provide farm families with an adequate standard of living. Farm operators in this area must invest more capital per acre in the form of fertilizer, seed, equipment, buildings, livestock and feed and in general follow a more scientific and intensive system of farming if they are to have adequate income. This study was designed to bring together available information related to the agriculture of this area and to demonstrate insofar as possible its application in improving farm production and income through more intensive and scientific systems of farming.

Newton County is predominately agricultural and there has been relatively little industrial development. The total population in Newton County was classified as rural in 1940, of which about three-fourths was classified as rural-farm. Farm operators are predominately white and about two-thirds of the "census farms" are operated by owners.

Significant changes have taken place in systems of farming in Newton County in recent years. Between 1929 and 1944, the proportion of land devoted to cotton decreased from 53 to 23 percent and the

proportion devoted to feed crops, corn, hay and oats, increased from 42 percent to 73 percent. Livestock numbers increased in proportion to the increased feed supply. Similar shifts took place in the Shortleaf Pine Area and in the state as a whole, although the changes were not so pronounced. Lower yield of cotton per acre was the primary reason for the greater shift from cotton to feed crops and livestock in Newton County.

In 1946, practically all producers from which information was obtained used fertilizer on cotton and corn; the amount used, however, was below Experiment Station recommendations in practically all cases. That increased fertilization will pay in this area is indicated by the fact that those farmers who fertilized corn above the average for the group studied in 1946 produced almost twice as much corn per acre as did those who fertilized below average. April cotton and March corn produced more per acre than did that planted later.

In 1946, dairy cows were supplied with sufficient concentrates, but the amount of roughage and grazing supplied was inadequate. Feeding rates for other livestock were too low on most farms studied.

Apparently, barn feeding alone is not the answer to economical milk production in Newton County. In 1946, the

farmers who did the heaviest barn feeding produced more milk than did those who did the least amount of barn feeding; however, the cost of the additional feed was more than the value of the additional milk produced. Adequate grazing appears to be the answer. Those farmers who had improved pastures and provided their cows with winter grazing produced about one and one-half times as much milk per cow than did those who had unimproved pastures and no winter grazing; both groups did about the same amount of barn feeding and utilized about the same amount of land for grazing.

Mules are still used for power on most farms in Newton County. The majority of farmers owning tractors use them for seedbed preparation only and continue to cultivate their crops with half-row mule equipment. The use of tractors for all field operations would materially increase the amount of land that one man could handle.

Opportunities for increasing crop yields and livestock production rates are good. Production specialists have indicated that crop yields and livestock production rates could be doubled and in some cases tripled through the use of the best farming practice now known to Experiment Station and Extension Service workers.

Farms as operated in 1946 were characterized by low crop yields and livestock production rates, a family labor force that was idle much of the year and the failure to make use of available natural resources. Idle cropland varied from 2 acres on the typical 40-acre farm to 40 acres on the typical 360-acre farm.

Through farm reorganization that would make use of all natural resources and employ the farm family throughout the year, and adoption of improved farming practices, net cash income on farms in this area could be increased materially. The major obstacles to shifting to more intensive systems of farming in this area are (1) low managerial performance of

many farm operators (2) inadequate capital and (3) inadequate market outlets for the majority of farmers for commodities other than cotton. These obstacles can be overcome, however, over a period of years through an intensified agricultural educational program, through sound financial planning on the part of farmers and lending agencies, and through planned production and marketing of quality products.

In shifting to more intensive systems of farming, the less complex changes such as using more fertilizer and better seed for row crops should be carried out first because they are easy to initiate and there is a quick return on the capital expended. If borrowed, this capital can be repaid in less than a year. The addition or expanding of livestock enterprises and the grazing and feed crops they are dependent upon should be started later and expanded to the desired size over a period of years.

Though farm reorganization and improved practices, net cash income on a typical 40-acre farm could be increased from \$70 to \$260 with a dairy-cotton system of farming. Thus, when farmed according to the best known method, the 40-acre farm is too small to provide the average farm family with an adequate income if commercial production is limited to those products that are usually produced commercially in this area. However, if a laying flock of 500 hens were added to the dairy-cotton system, net cash income would be increased to about \$735; if a broiler enterprise of 2,000 birds every 3 months were added to the dairy-cotton system net cash income would be increased to approximately \$1,430.

Through farm reorganization and improved practices net cash income on a typical 80-acre farm could be increased from \$135 to about \$720 with a dairy-cotton system of farming and to \$1,300 if a laying flock of 500 hens were added to the dairy-cotton system. Similarly, net

cash income on a typical 160-acre farm could be increased from \$340 to about \$2,660 with a Grade A dairy-cotton system of farming and to about \$3,170 with a Grade A dairy-poultry system of farming. On a typical 360-acre farm, net cash income could be increased from \$375 to about \$2,270 with a beef-hog system of farming and to about \$3,940 with a Grade A dairy-cotton system of farming.

The 160-and 360-acre farms would be operated with tractor power and milking machines would be used. The suggested

systems of farming for the farms of 40, 80 or 160 acres could be operated by one one family without hiring additional labor, except for a small amount of cotton picking on the 160-acre Grade A dairy-cotton system of farming. One family could operate the typical 360-acre unit with a beef-hog system of farming by hiring a small amount of labor during the hay and corn harvesting season; with the Grade A dairy-cotton one full-time wage worker would be required plus the utilization of his family in cotton and hoeing and harvesting.

APPENDIX

Table 1. Prices used in calculating normal farm income and expenses.

| Item | Unit | Normal price | Item | Unit | Normal price |
|-----------------------------|------|--------------|-----------------------------|---------|--------------|
| Products sold: | | dollars | | dollars | |
| Cotton | lb. | .14 | Tankage | cwt. | 3.00 |
| Cottonseed | ton | 40.00 | Corn | bu. | 1.00 |
| Lespedeza hay, baled | ton | 15.00 | Lespedeza seed | lb. | .15 |
| Calves, grass fat | cwt. | 10.00 | Crimson clover seed | lb. | .15 |
| Cows, beef | cwt. | 8.00 | Cottonseed | bu. | 3.00 |
| Cows, cull dairy | cwt. | 6.50 | Corn, hybrid seed | bu. | 8.00 |
| Milk, grade A | cwt. | 3.75 | Oat seed | bu. | 1.00 |
| Milk, mfg. | cwt. | 2.75 | Sudan seed | lb. | .08 |
| Hogs, good quality | cwt. | 11.00 | Fuel oil and grease | | |
| Hens | lb. | .20 | for 1-row tractor | hr. | .21 |
| Broilers | lb. | .23 | Fuel oil and grease | | |
| Eggs | doz. | .25 | for 2-row tractor | hr. | .24 |
| Item purchased: | | | Man labor | hr. | .20 |
| Am. Nit., 32.5% | cwt. | 2.50 | Cotton picking | cwt. | 1.75 |
| Phosphate, 20% | cwt. | 1.00 | Disc land, 1 time over | acre | 1.00 |
| Potash, 50% | cwt. | 2.00 | Mow | acre | 1.00 |
| 5-10-5, etc. | cwt. | 1.50 | Mow and rake | acre | 1.50 |
| Lime | ton | 3.40 | Combine oats | acre | 3.00 |
| Cottonseed meal | cwt. | 2.00 | Bale hay | ton | 2.50 |
| Laying mash | cwt. | 3.00 | Haul cotton | bale | 1.00 |
| Broiler feed | cwt. | 3.00 | | | |
| | | Percent | | | Percent |
| Repairs: | | new cost | Depreciation: | | new cost |
| Tractor | | 5.0 | Tractor | | 10.0 |
| Tractor equipment | | 5.0 | Tractor equipment | | 7.5 |
| Mule equipment | | 5.0 | Mule equipment | | 5.0 |
| Dairy and poultry equipment | | 5.0 | Dairy and poultry equipment | | 10.0 |
| Buildings | | 3.0 | Buildings | | 3.0 |
| Fences | | 5.0 | Fences | | 5.0 |

Source: The normal prices received by farmers as given in this table are the estimations of price specialists of the Bureau of Agricultural Economics adjusted to Mississippi conditions. The normal prices paid by farmers are the prices paid by farmers in 1943 and were taken from reports of the Statistical Division of the Bureau of Agricultural Economics and price list of various companies, etc.

In analyzing the situation as to what normal prices would be in the mid-fifties, price specialists of the Bureau of Agricultural Economics stated that if employment remained at a relatively high level the prices paid by farmers would be at about the level existing in 1943, but that the prices received for farm commodities would be about 25 percent below the 1943 level.

Table 2. Family Labor Utilization Summary, Typical Sized Farms As Operated In 1946 And Under Suggested Reorganization, Newton County, Mississippi

| Item | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|--|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Hours of labor available in the average farm family on days available for field work ¹ | 202 | 202 | 269 | 269 | 388 | 456 | 480 | 528 | 408 | 319 | 286 | 168 | 3975 |
| Hours of family labor used on livestock and field crops on days available for field work; ² | | | | | | | | | | | | | |
| 40 acre farm as operated in 1946 | 28 | 40 | 124 | 190 | 254 | 219 | 86 | 69 | 170 | 189 | 76 | 19 | 1464 |
| 40 acre farm, reorganization Plan 1 | 39 | 68 | 112 | 135 | 172 | 164 | 63 | 181 | 262 | 208 | 131 | 25 | 1560 |
| 40 acre farm, reorganization Plan 2 | 60 | 88 | 171 | 191 | 238 | 212 | 117 | 242 | 298 | 242 | 161 | 42 | 2062 |
| 40 acre farm, reorganization Plan 3 | 87 | 116 | 176 | 199 | 247 | 239 | 143 | 269 | 343 | 284 | 199 | 65 | 2367 |
| 80 acre farm as operated in 1946 | 45 | 65 | 184 | 269 | 355 | 306 | 117 | 96 | 217 | 254 | 108 | 31 | 2047 |
| 80 acre farm, reorganization Plan 1 | 73 | 107 | 195 | 174 | 209 | 234 | 103 | 457 | 404 | 283 | 201 | 50 | 2490 |
| 80 acre farm, reorganization Plan 2 | 85 | 119 | 269 | 233 | 272 | 256 | 139 | 446 | 408 | 319 | 286 | 65 | 2897 |
| 160 acre farm as operated in 1946 | 53 | 78 | 302 | 303 | 428 | 496 | 172 | 138 | 361 | 319 | 205 | 35 | 2890 |
| 160 acre farm, reorganization Plan 1 | 109 | 153 | 256 | 191 | 236 | 338 | 176 | 447 | 408 | 319 | 286 | 86 | 3005 |
| 160 acre farm, reorganization Plan 2 | 126 | 191 | 269 | 269 | 253 | 356 | 219 | 449 | 337 | 319 | 286 | 101 | 3175 |
| 360 acre farm as operated in 1946 | 76 | 107 | 163 | 202 | 305 | 278 | 152 | 160 | 233 | 265 | 123 | 53 | 2117 |
| 360 acre farm, reorganization Plan 1 | 89 | 153 | 269 | 170 | 152 | 239 | 113 | 401 | 379 | 319 | 286 | 70 | 2640 |
| 360 acre farm, reorganization Plan 2 ³ | 210 | 279 | 432 | 337 | 453 | 546 | 328 | 732 | 648 | 547 | 490 | 169 | 5171 |
| Total hours of family labor used; ⁴ | | | | | | | | | | | | | |
| 40 acre farm as operated in 1946 | 45 | 57 | 143 | 212 | 272 | 235 | 97 | 77 | 180 | 201 | 90 | 37 | 1646 |
| 40 acre farm, reorganization Plan 1 | 84 | 115 | 155 | 175 | 201 | 189 | 93 | 197 | 281 | 237 | 159 | 67 | 1953 |
| 40 acre farm, reorganization Plan 2 | 143 | 173 | 279 | 285 | 319 | 275 | 182 | 293 | 344 | 297 | 222 | 131 | 2943 |
| 40 acre farm, reorganization Plan 3 | 208 | 227 | 279 | 295 | 325 | 309 | 217 | 321 | 401 | 361 | 279 | 191 | 3413 |
| 80 acre farm as operated in 1946 | 77 | 95 | 212 | 301 | 382 | 330 | 133 | 108 | 232 | 272 | 129 | 66 | 2337 |
| 80 acre farm, reorganization Plan 1 | 170 | 198 | 317 | 254 | 311 | 293 | 207 | 497 | 449 | 339 | 267 | 150 | 3452 |
| 80 acre farm, reorganization Plan 2 | 201 | 224 | 407 | 373 | 401 | 335 | 262 | 507 | 466 | 390 | 367 | 188 | 4121 |
| 160 acre farm as operated in 1946 | 91 | 115 | 335 | 340 | 458 | 524 | 191 | 152 | 378 | 340 | 229 | 76 | 3229 |
| 160 acre farm, reorganization Plan 1 | 288 | 390 | 402 | 337 | 388 | 446 | 358 | 531 | 502 | 448 | 388 | 284 | 4762 |
| 160 acre farm, reorganization Plan 2 | 340 | 458 | 474 | 465 | 450 | 495 | 435 | 564 | 453 | 456 | 437 | 336 | 5363 |
| 360 acre farm as operated in 1946 | 158 | 185 | 223 | 255 | 349 | 318 | 181 | 183 | 260 | 304 | 163 | 138 | 2717 |
| 360 acre farm, reorganization Plan 1 | 215 | 346 | 374 | 251 | 281 | 299 | 378 | 444 | 430 | 382 | 352 | 209 | 3961 |
| 360 acre farm reorganization Plan 2 ³ | 565 | 689 | 720 | 621 | 754 | 757 | 756 | 900 | 835 | 766 | 732 | 559 | 8654 |

Source: Labor requirements for reorganized farm based upon Appendix Tables 3 and 4, with some adjustments during planting and harvesting season. Labor requirements for farms as operated in 1946 based upon Table 3, Mississippi Experiment Station Bulletin Number 387.

¹Man equivalents of family labor available for each month x days available for field work each month (days in month minus rainy days, Sundays and holidays) x 12 (the maximum number of hours to be worked per day during peak seasons).

²Total hours spent on crops plus the hours spent on livestock on the days available for field work.

³Includes the labor performed by a full time wage hand. Total hours of labor available on days fit for field work (including the full time wage hand) would be as follows: J, 346; F, 346; M, 461; A, 461; M, 616; J, 684; J, 720; A, 792; S, 648; O, 547; N, 490; D, 228.

⁴Exclusive of time spent on maintenance of buildings, fences and equipment.

Unit of Livestock, When Using Improved Crop An.1 Livestock Practices, Newton County, Mississippi

| Item | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| Crops; one mule; ¹ | | | | | | | | | | | | | |
| Cotton | .7 | 2.3 | 4.0 | 11.1 | 16.8 | 14.2 | 3.0 | 10.0 | 40.0 | 25.0 | 10.0 | 10.0 | 137.1 |
| Corn | .7 | 1.5 | 9.8 | 6.6 | 5.5 | 2.5 | | | | 9.9 | 9.9 | | 46.4 |
| Oats, grain and grazing | | | 2.0 | | | 1.4 | | 1.5 | 1.5 | | | | 6.4 |
| Lespedeza hay (after oats) | | 1.0 | | | | | | 8.5 | 8.5 | | | | 18.0 |
| Sudan grass | | | | | | 19.1 | 3.0 | 5.0 | | | | | 27.1 |
| Sweetpotatoes (Commercial) | 2.0 | 10.5 | 9.5 | 30.8 | 35.7 | 9.0 | | | 39.5 | 39.5 | | | 176.5 |
| Crops; two mules: | | | | | | | | | | | | | |
| Cotton | .6 | 2.3 | 3.2 | 8.9 | 13.6 | 11.1 | 1.6 | 10.7 | 42.8 | 26.8 | 10.7 | | 132.3 |
| Corn | .6 | 1.5 | 7.7 | 4.4 | 3.4 | 1.8 | | 4.2 | 4.2 | 9.9 | 9.9 | | 39.2 |
| Oats, grain and grazing ² | | | 2.0 | | | 1.4 | | 9.7 | 9.6 | | | | 11.8 |
| Lespedeza hay (after oats) | | 1.0 | | | | | 1.6 | 5.1 | | | | | 20.3 |
| Sudan grass | | | | | | 11.8 | | | | | | | 18.5 |
| Sweetpotatoes (Commercial) | 1.2 | 9.2 | 8.1 | 28.5 | 33.4 | 8.0 | | | 37.5 | 37.5 | | | 163.4 |
| Crops; one-plow (one-row) tractor: | | | | | | | | | | | | | |
| Cotton | .3 | 1.6 | 2.1 | 2.5 | 9.8 | 4.7 | 1.0 | 10.6 | 42.3 | 26.5 | 10.6 | | 112.0 |
| Corn | .3 | 1.6 | 3.7 | 2.2 | 1.6 | .6 | | 2.1 | 2.1 | 11.4 | 11.4 | | 32.8 |
| Oats, grain and grazing | | | 1.4 | | | 3.6 | | 2.4 | 2.4 | | | | 9.2 |
| Lespedeza hay (after oats) ³ | | | .7 | | | | 1.0 | 2.0 | | | | | 5.5 |
| Sudan grass | | | | | | 4.4 | | | | | | | 7.4 |
| Sweetpotatoes (Commercial) | .6 | 7.2 | 4.5 | 19.3 | 24.3 | 6.0 | | | 36.0 | 36.0 | | | 133.9 |
| Crops; two-plow (two-row) tractor: | | | | | | | | | | | | | |
| Cotton | .2 | .9 | 1.2 | 1.5 | 8.9 | 3.8 | .6 | 10.3 | 41.2 | 25.7 | 10.3 | | 104.6 |
| Corn | .2 | .9 | 2.2 | 1.4 | 1.0 | .3 | | 1.5 | 1.5 | 10.8 | 10.8 | | 27.6 |
| Oats, grain and grazing | | | 1.0 | | | 2.8 | | 2.3 | 2.3 | | | | 6.8 |
| Lespedeza hay (after oats) | | .5 | | | | | .6 | 1.3 | | | | | 4.8 |
| Sudan grass | | | | | | 2.9 | | | | | | | 4.8 |
| Sweetpotatoes (Commercial) | .3 | 6.3 | 3.6 | 15.6 | 20.6 | 5.6 | | | 35.0 | 35.0 | | | 122.0 |
| Livestock (per head): | | | | | | | | | | | | | |
| Workstock | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 6 | 67 |
| Milk cows, hand, manufacturing | 13 | 13 | 12 | 12 | 12 | 11 | 10 | 10 | 10 | 11 | 12 | 12 | 138 |
| Milk cows, machine, manufacturing | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 90 |
| Milk cows, machine, Grade A | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 114 |
| Beef cows | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 28 |
| Sow and litters | 5 | 5 | 6 | 5 | 5 | 4 | 4 | 4 | 5 | 6 | 5 | 5 | 59 |
| Hens (flock of 500) | 62 | 56 | 124 | 120 | 124 | 90 | 93 | 93 | 60 | 62 | 60 | 62 | 1006 |
| Broilers (8,000) | 124 | 112 | 124 | 120 | 124 | 120 | 124 | 124 | 120 | 124 | 120 | 124 | 1460 |

¹The following would be done on a custom basis and is not included in labor requirements: Cotton hauling; land preparation for oats and combining oats; and mowing and raking hay.

²Combined on custom basis and combining is not included in labor requirements.

³Baled on custom basis and baling is not included in labor requirements.

Table 4. Estimated Hours of Power Required Per Acre For Major Crops By Type Of Power Used, When Using Improved Crop Practices, Newton County, Mississippi

| Item | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Crops; one mule ¹ | | | | | | | | | | | | | |
| Cotton | .7 | 2.3 | 3.0 | 7.6 | 6.8 | 6.7 | 3.0 | | | | | | 30.1 |
| Corn | .7 | 1.5 | 8.3 | 6.1 | 4.5 | 1.5 | | | 9.9 | 9.9 | | | 42.4 |
| Oats, grain grazing | | | | | | 1.4 | | | | | | | 1.4 |
| Lespedeza hay (after oats) | | | | | | | | 5.0 | 5.0 | | | | 10.0 |
| Sudan grass | | | | | | 17.1 | 3.0 | | | | | | 23.1 |
| Sweetpotatoes (Commercial) | 2.0 | 7.5 | 6.5 | 5.8 | 6.7 | 4.0 | | | 7.0 | 7.0 | | | 46.5 |
| Crops; two mules: | | | | | | | | | | | | | |
| Cotton | 1.2 | 4.6 | 4.0 | 8.9 | 7.2 | 7.2 | 3.2 | 1.4 | 5.6 | 3.6 | 1.4 | | 48.3 |
| Corn | 1.2 | 3.0 | 10.8 | 7.1 | 4.8 | 1.6 | | | | 6.6 | 6.6 | | 41.7 |
| Oats, grain and grazing ² | | | | | | 1.4 | | 5.4 | 5.4 | | | | 12.2 |
| Lespedeza hay (after oats) | | | | | | | | 7.3 | 7.3 | | | | 14.6 |
| Sudan grass | | | | | | 18.8 | 3.2 | 6.2 | | | | | 28.2 |
| Sweetpotatoes (Commercial) | 2.4 | 10.4 | 9.9 | 6.6 | 7.8 | 4.0 | | | 7.0 | 7.0 | | | 55.1 |
| Crops; one-plow (one-row) tractor: | | | | | | | | | | | | | |
| Cotton | .3 | 1.6 | 2.1 | 2.5 | 2.3 | 2.2 | 1.0 | .6 | 2.3 | 1.5 | .6 | | 17.0 |
| Corn | .3 | 1.6 | 3.7 | 2.2 | 1.6 | .6 | | | | 2.9 | 2.8 | | 15.7 |
| Oats, grain and grazing | | | | .7 | | 1.8 | | 1.7 | 1.8 | | | | 6.0 |
| Lespedeza hay (after oats) ³ | | | | .7 | | | | 1.5 | 1.6 | | | | 3.8 |
| Sudan grass | | | | | | 4.4 | 1.0 | 2.0 | | | | | 7.4 |
| Sweetpotatoes (Commercial) | .6 | 3.2 | 2.5 | 4.8 | 4.8 | 1.0 | | | 2.2 | 2.3 | | | 21.4 |
| Crops; two-plow (two-row) tractor: | | | | | | | | | | | | | |
| Cotton | .2 | .9 | 1.2 | 1.5 | 1.4 | 1.3 | .6 | .3 | 1.2 | .7 | .3 | | 9.6 |
| Corn | .2 | .9 | 2.2 | 1.4 | 1.0 | .3 | | | | 2.7 | 2.7 | | 11.4 |
| Oats, grain and grazing | | | | .5 | | 1.4 | | 1.2 | 1.3 | | | | 4.4 |
| Lespedeza hay (after oats) | | | | | | | | 1.6 | 1.7 | | | | 3.8 |
| Sudan grass | | | | | | 2.9 | .6 | 1.3 | | | | | 4.8 |
| Sweetpotatoes (Commercial) | .3 | 2.3 | 1.6 | 1.8 | 1.9 | .6 | | | 1.6 | 1.6 | | | 11.7 |

Source: Based upon recommended planting and cultural practices and the labor requirements for individual operations given in Table 24.

¹The following would be done on a custom basis and is not included in power requirements: Cotton hauling; land preparation for oats and combining oats; and mowing and raking hay.

²Combined on custom basis and combining is not included in power requirements.

³Baled on custom basis and baling is not included in labor requirements.