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Increasing Incomes and Conserving Resources on Cotton-Corn Farms in Marion County, Alabama

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Increasing Incomes and Conserving Resources on Cotton-Corn Farms in Marion County, Alabama*

CHANGING economic conditions in recent years have focused attention upon such agricultural problems as low farm incomes, low levels of farm family living, one-cash-crop farming systems, rapid depletion of soils and other productive resources, and unfavorable ratios of farm population to agricultural resources. Much of Alabama's agriculture is characterized by such problems. Marion County, located in the northwestern

part of the state was selected as being representative of much of the Upper Coastal Plains farming area of Alabama and Mississippi (Figure 1). This county was studied to point out adjustments that might increase farm income and conserve soil and woodland resources.

Farming in Marion County is centered on cotton as a cash crop, in fact 95 per cent of all farms in the County are classed as cotton-corn (type) farms. The need to conserve soil resources and increase farm incomes emphasizes the necessity of developing a better balanced system of farming.

When agriculture in this county was first developed (about 1800), production of cotton was only a sideline. Cattle and hogs on the open range and the accompanying production of feed crops were the major enterprises. Lumbering was important for a short time after the advent of railroads, but the good timber was soon exhausted. Today relatively little farm income is available from farm woodlands. Coal mining provides off-farm employment for a few farm people. However,

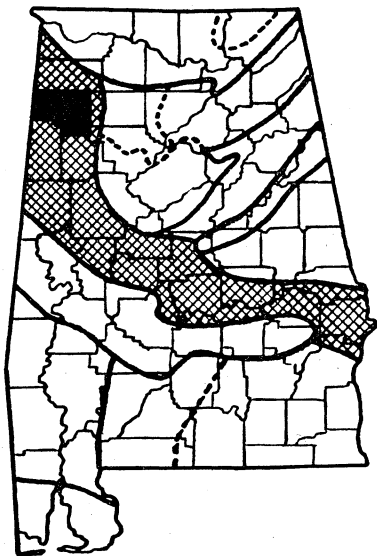


FIGURE 1.—Location of Marion County in Relation to the Upper Coastal Plains Farming Area of Alabama.

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cotton production with its high value per acre has made it possible for the available land resources to support, although inadequately, an increasingly large farm population.

Physical Factors

The County is gently rolling to hilly, with soils, derived principally from Coastal Plains materials, ranging from silt loams to sandy loams. These soils are readily distinguishable by the presence of small, rounded, water-worn gravel near or on the surface. Major upland soil series are Savannah and Atwood which have reasonably good natural productivity, but erosion has reduced the yields on nearly all upland soils, and upland sediment has lowered yields on many of the bottomland soils not subject to flood hazards.

The average annual rainfall is about 52 inches. Frequent torrential showers increase the danger of erosion but these rains usually are well timed to the needs of growing crops. The normal growing season of 200 days extends from the first week in April through the third week in October.

Farm Trends

From 1900 to 1940 the rural population (97 per cent white) of the county doubled, as indicated by the Federal Census. During this period the number of farms increased approximately 50 per cent, and the average size of farms decreased from 132 to 84 acres. The number of owner-operators declined from 67 to 45 per cent of all farmers. These changes resulted in a decrease of improved farm land per person from 5.5 to 4.3 acres, an extremely small acreage when the present low productivity of the soil is considered.

Cotton acreage per farm dropped from 10 acres in 1930 to 6.4 acres in 1940, but yields were increased considerably. In contrast, most other crop yields have scarcely changed since 1900. In recent years, there has been some increase in the use of commercial fertilizers and soil-improving and soil-conserving crops, with but few changes in general tillage practices.

Size of Farms

Size of operating unit is a major factor affecting farm adjustments and the time required to make those adjustments. In Marion County the number of mules varies in almost direct proportion to the amount of cropland on farms and offers a simple means of classifying farms into size groups. A farm operating unit as considered here includes the land and the accompanying enterprises worked together by a farm operator, his wage hands, and his croppers.

Approximately one-third of the farms are operated with one mule, one-half with two mules, and slightly less than one-fifth with three or more mules. Thus, over 80 per cent of the farms are operated with two mules or less (Figure 2).

Labor Supply and Requirements

Fortunately, changes on most Marion County farms will not be hampered by lack of labor or by high cash labor costs. The farm family is the main source of labor and nearly two-thirds of the farms are operated with little or no hired help. The average one-mule farm, family-operated, has 3.1 field workers or 2.6 man-equivalent¹ workers available compared with 4.3 field workers or 3.6 man-equivalent workers on two-mule farms which also stay largely within the limits of the family labor supply. The operator's family labor on three-mule farms is about the same in man-equivalent workers as that on two-mule farms, but the larger unit usually requires sharecropper labor or wage labor by the month or day.

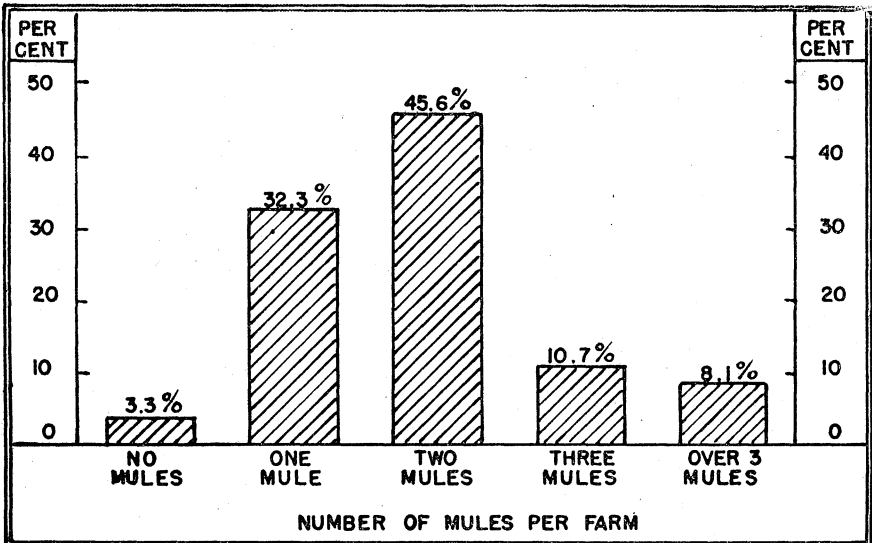


FIGURE 2.—Distribution of Farms by Size, Marion County, Alabama.

Less than one-third of the available farm labor supply is used for field work each year (Table 1). The unused labor could be better employed under a re-organized system of farming or off the farm in non-farm employment.

Labor Requirements for Specified Crops.—Reorganization of the farm business to obtain the maximum use of labor and available equipment can contribute materially to the family income. All the major crops grown in this county compete with cotton for labor to some extent (Figure 3). On most farms work on cotton takes precedence over all other work. The shaded areas show periods during which most farmers perform the particular

¹Includes women and children of working age, with allowances for types of field work commonly done by these groups and for the usual school term.

TABLE 1.—Labor (Man-day Equivalents) Available and Used for Field Work per Farm Monthly and Annually, for Representative One-, Two-, and Three-Mule Cotton-Corn Farms, Marion County, Alabama¹.

Month	Days available for field work	One-mule farms		Two-mule farms		Three-mule farms ²	
		Man days available	Man days used	Man days available	Man days used	Man days available	Man days used
January	5.2	10	³	12	³	24	³
February	6.9	14	³	16	³	32	³
March	10.9	21	14	26	17	50	26
April	15.0	29	19	35	24	69	36
May	17.7	42	26	55	41	106	63
June	19.2	51	18	68	29	133	43
July	20.5	54	4	73	5	142	8
August	20.7	52	4	67	6	131	9
September	20.2	43	12	53	18	103	26
October	19.0	39	19	48	30	93	45
November	14.3	28	4	34	6	66	9
December	7.8	15	³	18	³	36	³
Total	177.4	398	120	505	176	985	265
Per cent used	xx	xx	30	xx	34	xx	27

¹Days used include labor used for field work on all field crops plus an estimate of the amount of labor used in the family garden and other small patches of crops grown for home use. Allowances were made for women and children.

²Representative three-mule farms are operated by two families — that of the operator plus a sharecropper family.

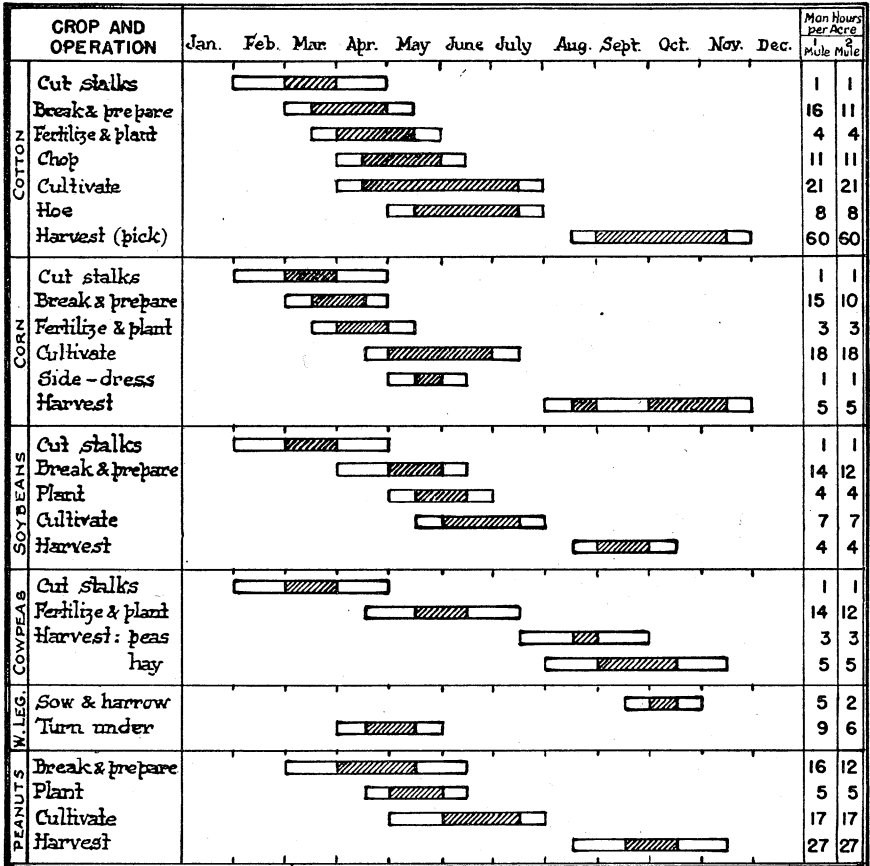
³Less than one day reported.

operation. For example, cotton planting was generally done within a 12-day period. However, planting dates reported varied from April 3 until as late as May 20.

Cotton demands a large amount of attention in May and June and again in September and October. During approximately these same periods corn labor requirements are greatest. Some soybean and small-grain operations, however, can be carried on at times when work on cotton and corn is not fully utilizing the farm labor force. It is easy to overestimate the possibility of gaining efficiency by varying the dates for operations such as planting and harvesting. Actually unless these operations are performed on time, severe losses in both yield and quality may result.

In organizing cropping systems, the seasonal work load should not exceed that which can be handled under ordinary weather conditions. The estimated days, by months, suitable for work in the field are shown in Table 1.

The chief advantages of having more mule power come in spring plowing and harvesting of small grains and hay. Also farmers agree that the quality of work done with two-mule equipment is consistently better even though the time required for some operations is not much less than with one-mule equipment. Planting, fertilizing, and cultivating are one-mule operations. Consequently, two-mule farms save little man labor in these operations (Table 2).



Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

TIME OPERATIONS ARE PERFORMED:

▨ USUAL PERFORMANCE □ VARIATION FROM USUAL PERIOD

1. Man hours required with one mule are based upon use of one-mule equipment except for harvesting.
2. Man hours required with two mules are based upon use of two-mule equipment except for planting, fertilizing and cultivating.

FIGURE 3.—Usual Periods and Variations from Usual Periods, Crop Labor Performance by Major Operations, Specified Crops, with Average Yields, Marion County, Alabama.

TABLE 2.—Usual Man and Mule Labor Requirements in Days per Acre for Specified Crops, by Months, Marion County, Alabama.

Crop	Level of equip. used ¹	Kind of labor	Days of labor per acre												Total
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Cotton	(1)	Man	.0	.0	.8	1.5	2.1	1.3	.4	.0	2.2	3.2	.6	.0	12.1
		Mule	.0	.0	.8	1.2	1.0	.9	.3	.0	.3	.5	.1	.0	5.1
	(2)	Man	.0	.0	.6	1.2	2.1	1.3	.4	.0	2.2	3.2	.6	.0	11.6
		Mule	.0	.0	.9	1.3	1.0	.9	.3	.0	.3	.5	.1	.0	5.3
Corn (alone)	(1)	Man	.0	.0	.8	1.1	1.1	.8	.0	(.3)	.0	.4	.1	.0	4.3
		Mule	.0	.0	.8	.9	.8	.7	.0	.0	.0	.4	.1	.0	3.7
	(2)	Man	.0	.0	.6	.8	1.1	.8	.0	(.3)	.0	.4	.1	.0	3.8
		Mule	.0	.0	.9	1.1	.8	.7	.0	.0	.0	.4	.1	.0	4.0
Soybeans (in rows for hay)	(1)	Man	.0	.0	.1	.0	1.5	.7	.3	.0	.4	.0	.0	.0	3.0
		Mule	.0	.0	.1	.0	1.5	.7	.3	.0	.8	.0	.0	.0	3.4
	(2)	Man	.0	.0	.1	.0	1.3	.7	.3	.0	.4	.0	.0	.0	2.8
		Mule	.0	.0	.1	.0	2.2	.7	.3	.0	.8	.0	.0	.0	4.1
Cowpeas (sowed for hay)	(1)	Man	.0	.0	.1	.0	.7	.7	.0	(.3)	.4	.1	.0	.0	2.0
		Mule	.0	.0	.1	.0	.7	.6	.0	.0	.6	.3	.0	.0	2.3
	(2)	Man	.0	.0	.1	.0	.6	.6	.0	(.3)	.4	.1	.0	.0	1.8
		Mule	.0	.0	.1	.0	1.0	1.0	.0	.0	.6	.3	.0	.0	3.0

TABLE 2.—Usual Man and Mule Labor Requirements in Days per Acre for Specified Crops, by Months, Marion County, Alabama. (Continued).

Crop	Level of equip. used ¹	Kind of labor	Days of labor per acre												
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Winter leg. (turned under)	(1)	Man	.0	.0	.0	.4	.5	.0	.0	.0	.0	.5	.0	.0	1.4
		Mule	.0	.0	.0	.4	.5	.0	.0	.0	.0	.3	.0	.0	1.2
	(2)	Man	.0	.0	.0	.2	.4	.0	.0	.0	.0	.2	.0	.0	.8
		Mule	.0	.0	.0	.4	.7	.0	.0	.0	.0	.2	.0	.0	1.3
	(1)	Man	.0	.0	.0	1.0	1.1	1.3	.4	.0	1.4	1.3	.0	.0	6.5
		Mule	.0	.0	.0	1.0	.8	.7	.2	.0	.9	.1	.0	.0	3.7
Peanuts (non-com.)	(2)	Man	.0	.0	.0	.8	.9	1.3	.4	.0	1.4	1.3	.0	.0	6.1
		Mule	.0	.0	.0	1.4	1.0	.7	.2	.0	.9	.1	.0	.0	4.3
S. pot. (non-com.)	(2)	Man	.0	.0	.0	3.6	.9	.8	.0	.0	1.5	1.5	.0	.0	8.3
		Mule	.0	.0	.0	4.9	.5	.4	.0	.0	.6	.5	.0	.0	6.9
	(1)	Man	.0	.0	.0	.0	1.6	.9	1.2	.0	3.9	.0	.0	.0	7.6
		Mule	.0	.0	.0	.0	1.6	.5	.6	.0	.5	.0	.0	.0	3.2
Sorghum (syrup)	(2)	Man	.0	.0	.0	.0	1.5	.9	1.2	.0	3.9	.0	.0	.0	7.5
		Mule	.0	.0	.0	.0	2.5	.5	.6	.0	.5	.0	.0	.0	4.1

¹Numbers under column "Level of equipment used" are:

(1) All one-mule equipment except harvesting which usually requires two-mule equipment.

(2) One- and two-mule equipment: all operations are with two-mule equipment except planting, fertilization, and cultivation. These operations are ordinarily done with one-mule equipment even on two-mule farms.

HOW TO INCREASE INCOMES AND CONSERVE RESOURCES ON ONE-, TWO-, AND THREE-MULE "COTTON-CORN" FARMS

The following discussion, based on representative¹ farms and usual production practices, indicates what farmers can do and what income they can expect from better systems and improved practices.

Since most of the farmers in this county are following a cotton-corn system, the emphasis has been placed on reorganizing farms of that type. Substantial increase in farm income and the development of more soil conserving systems of farming will necessitate reorganizing crop and livestock enterprises and improving production practices. The reorganization of crop and livestock enterprises alone, without changing production practices, indicated little improvement in cash income and farm family living.

In all of the alternative systems developed, the acreage in crops is increased by clearing farm woodland and putting idle cropland into use. These changes involve an increase in corn acreage, a reduction in soybeans, and the introduction of kudzu, cowpeas, and fall oats as sources of additional feed. Not only were more crop acres handled in the alternative systems, but even more important were the increases in yields of all crops which should come as a result of improved practices. More and better fed livestock are introduced to utilize this additional feed, some of it as pasture. Each alternative system provides fuller and more profitable employment for the labor force found on farms in each group. It was assumed that all the woodland area would be improved by fire control and some would be cleared for crop and pasture. However, additional employment for the farm family can be obtained by improvement work in woodlands now characterized by badly depleted stands of second-growth pine and hardwood, and many undesirable trees². The work in the woods can usually be done at any time and can be easily fitted in with other farm work.

A Representative One-Mule Farm

One-third of all farmers operate one-mule farms containing an average of 22 acres of cropland. The representative one-mule farm has a total of 85 acres of land, two-thirds of which is woodland. Pastures seldom exceed ten acres, and 3 or 4 acres of the cropland are usually idle.

Cotton and corn yields on farms of this size are slightly below those on two-, and three-mule farms, mainly because operators of the larger farms apply more fertilizer per acre and are

¹Crop and livestock combinations commonly found on the major size groups of farms were approximated from AAA records, livestock survey data, and survey records obtained from farm visits.

²Field work for the woodland phase of this study was done by John M. Deyton, and C. A. McKinney, Junior Foresters, Soil Conservation Service. Details of this analysis are reported in a manuscript prepared for cooperative publication by the Alabama Agricultural Experiment Station and the Bureau of Agricultural Economics, United States Department of Agriculture, entitled "Using Farm Woodlands to Increase Farm Incomes in Marion County, Alabama".

able to do a more effective job of land preparation. There were no appreciable differences in the hay yields reported among the various sizes of units. Most of the livestock products and livestock are produced for home use.

Under the alternative system 8.5 acres of woodland are cleared to make possible an increase of 3 acres in permanent pasture and 5.5 acres in total cropland (Table 3). Hay acreage is increased almost 4 acres, largely from cropland which was formerly idle. The addition of 2 acres of corn and an increase in corn yield from 11 to 20 bushels per acre result in over twice as much corn for feed as is available under the present system. There is no appreciable change in the acreage of cotton. Cotton yield, however, increases 49 per cent with the heavier fertilizer application and the improved cropping system in the reorganized plan.

The greater supply of feed resulting from these changes will make it possible to increase rates of feeding and to add two cows and one brood sow (farrowing one litter). This livestock program will provide some livestock products for sale (Table 4).

TABLE 3.—Land Use and Crop Production with Present and Alternative Systems, Representative One-Mule Cotton-Corn Farm, Marion County, Alabama.

Land use	Unit	Present system			Alternative system ¹		
		Acres	Yield	Prod.	Acres	Yield	Prod.
Cotton, lint	Lb.	4.8	268	1286	5.0	400	2000
Cottonseed	Lb.		402	1930		600	3000
Corn	Bu.	10.1	11	111	12.0	20	240
Cowpeas in corn	Bu.	(7.5)	1	7.5	(5.0)	1	5
Soybean hay	Ton	2.3	.7	1.6	1.0	1	1
Fall oats	Bu.	(.0)			(3.0)	25 ²	75
Cowpeas	Bu.	.0			3.0	4	12
Kudzu hay	Ton	.0			5.0	1	5
Vetch		(.0)			(5.0)		Turned under
Garden and patches		1.6			2.0		
Idle cropland		3.7			.0		
Total cropland		22.5			28.0		
Pasture		7.0			10.0		
Woodland		53.5			45.0		
Other farm land		2.0			2.0		
Total farm land		85.0			85.0		

¹Assumes improved crop practices, including per-acre fertilizer applications of or equivalent to 600 pounds of 6-8-4 on cotton, 225 pounds of nitrate of soda on corn not following winter legumes, and the increased use of improved terraces and winter cover crops.

²May be cut for hay.

The alternative system increases the days of profitable employment for the family from 120 to 150 man days, and the peak load for mule labor is better distributed with the alternative system than it is at present. The fact that available mule labor is one of the limiting factors in crop production, particularly on one-mule farms, is brought out in Figure 4. In March and April

TABLE 4.—Livestock Numbers and Production with Present and Alternative Systems, Representative One-Mule Cotton-Corn Farm, Marion County, Alabama.

Item	Unit	Present system	Alternative system
Livestock:			
Workstock	No.	1	1
Cows	No.	1	3
Sows	No.	0	1
Hens	No.	25	25
Production:			
Milk	Gal.	425	1350
Calf	No.	1	1
Heifer	No.	0	1
Pork (home use)	Lb.	290	350
Pigs	No.	2 ¹	6
Eggs	Doz.	200	250
Chickens	No.	50	50

¹Two pigs bought for home meat supply.

the demand for mule labor often exceeds the available supply. The excess man and mule labor that is available during the summer and early winter could be used to advantage on many farms in terrace building and maintenance, construction or repair of farm buildings, equipment, and fences, and cutting and hauling timber products, particularly if two or more farmers should pool their labor and mules.

It will be more difficult to carry out proposed changes on one-mule farms than on larger units, because the additional expenses involved are relatively greater. The additional investment amounts to about \$350, and operating expenses are increased \$140. Families on one-mule farms are generally hard pressed for cash. Most of these operators will have to produce much of their seed and plants and, also, raise their additional breeding stock. Further, the greater risk involved with higher cash outlays for fertilizer and purchased seed will make it essential that strong and considerate financial backing be available in case a series of bad years is encountered at the start (Table 5). However, net cash income can be increased 82 per cent — an increase from \$102 to \$186 (Table 6). The increase in cash outlay adds to the risk, but the additional risk is made worthwhile by the increase in net cash income. With present systems of farming most families have less than \$150 per year to meet needs not provided by the farm. Several years will be needed before all the changes suggested in the alternative system can be effected. This time is needed to make capital improvements, to raise the needed livestock and to establish and obtain benefits from improved cropping systems. While these difficulties will be more evident on the small farms, some of the same considerations apply to suggested changes on the larger units.

The importance of farm family living on the one-mule farm is emphasized by the fact that the value of food, fuel, and shelter

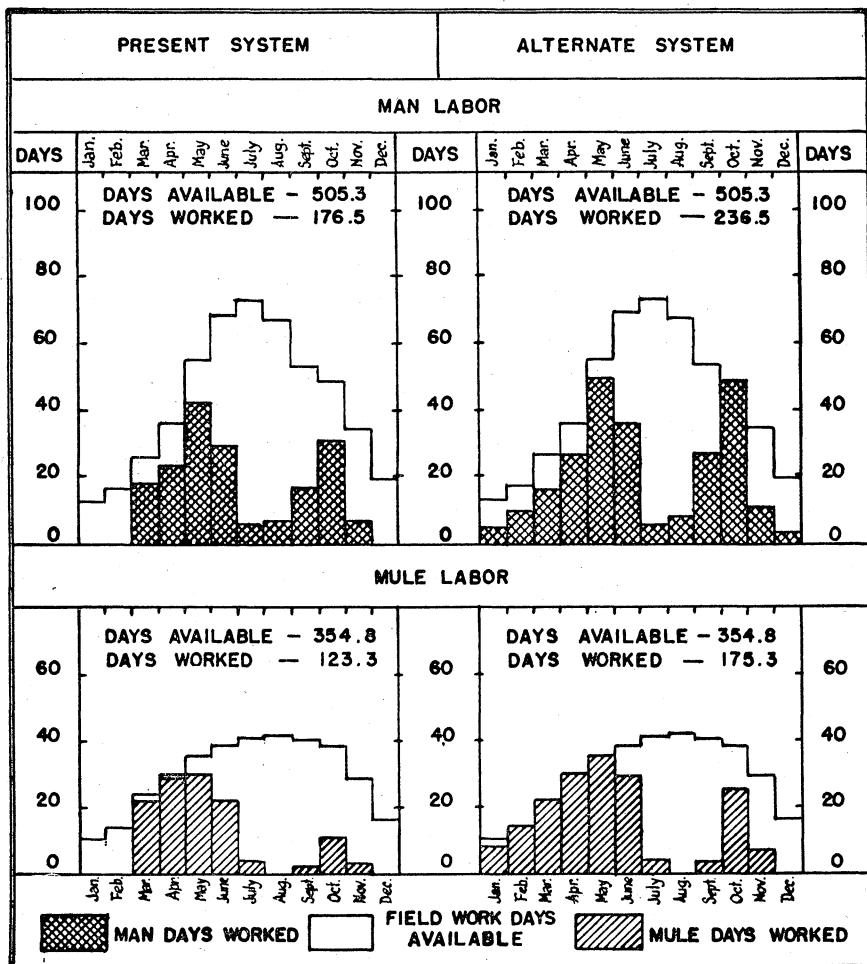


FIGURE 5. Usual Man and Mule Labor Requirements for Field Work, Representative Two-mule Cotton-Corn Farm, with Present and Alternative System, Marion County, Alabama.

which the family obtains from the farm exceeds the total cash income and more than doubles the net cash income (Table 7). Yet, production of many food items, such as milk and other vital foods, is inadequate for the dietary needs of many families on small farms. There is an evident need for a greater variety of vegetables and lengthening the season during which raw vegetables are available. The alternative system seems to provide sufficient quantities of the most important food items.

A Representative Two-Mule Farm

Almost half (46 per cent) of the farms in Marion County are two-mule units. These farms more nearly approach the con-

TABLE 5.—Cash Receipts and Expenses with Present and Alternative Systems, Representative One-Mule Cotton-Corn Farm, Marion County, Alabama¹.

Item	Unit	Present system		Alternative system	
		Quantity	Value	Quantity	Value
Cash receipts:					
Cotton, lint	Lb.	1268	\$133.15	2000	\$210.00
Cottonseed	Lb.	1230	18.45	2650	39.75
			\$151.60		\$249.75
Crop sales					
Veal calf	No.	1	5.00	1	5.00
Heifer	No.	—		1	35.00
Dairy products	—				30.00
Eggs	Doz.	85	17.00	85	17.00
Figs	No.	—		4	52.00
			\$ 22.00		\$139.00
Livestock sales					
AAA payment			35.00		45.00
Total cash income			\$208.60		\$433.75
Cash expenses:					
Seed and plants			10.60		20.00
Fertilizer			27.80		107.10
Ginning			8.10		14.00
Mower and rake hire			3.45		13.50
Miscellaneous			1.00		4.00
			\$50.95		\$158.60
Crop expenses					
Feed			7.50		30.00
Breeding fees			1.00		4.00
Purchases			6.00		
Miscellaneous			6.15		9.00
			\$ 20.65		\$ 43.00
Livestock expenses					
Machinery expenses			10.40		12.00
Building repairs			9.30		11.00
Fence repairs			4.00		6.00
Taxes			6.90		6.90
Interest on short-term credit			5.00		10.00
Total cash expenses			\$107.20		\$247.50
Net cash income			\$101.40		\$186.25

¹Income and expense items used in this analysis are valued at estimated average prices for the period 1935-39.

cept of a family-size unit than do farms in any of the other size groups. Ordinarily, these units have about 100 acres of land, over half of which is in woods (Table 8). Cropland per farm averages about 35 acres, of which more than 4 acres are idle and often badly eroded. Pastures seldom exceed 10 acres. Under the alternative system the acreage in crops is increased 16 acres, and pasture is increased 3 acres. This additional 19 acres will have to come from farm woodland and from idle cropland brought into productive use.

The alternative system provides enough feed to add one cow, two brood sows, and 40 hens to the livestock enterprises (Table 9). There is no great difference between the possibilities of in-

TABLE 6.—Summary of Farm Business and Family Labor Returns with Present and Alternative Systems, Representative One-Mule Cotton-Corn Farm, Marion County, Alabama.

Item	Present system		Alternative system	
	Dollars		Dollars	
Total cash income		209		434
Total cash expenses	107		248	
Net cash income		102		186
Depreciation	28		31	
Farm income		74		155
Interest on investment	39		46	
Net family return		35		109
Value of family living	269		305	
Non-farm income	35		35	
Family labor earnings		339		449

TABLE 7.—Value of Family Living with Present and Alternative Systems, Representative One-Mule Cotton-Corn Farm, Marion County, Alabama.

Item	Unit	Value ¹ per unit	Present system		Alternative system	
			Quantity ²	Value	Quantity ²	Value
Corn	Bu.	\$.80	15.0	\$ 12	15.0	\$ 12
Cowpeas	Bu.	1.40	2.5	4	2.5	4
Garden and patches	—			55 ³		70
Milk	Gal.	.20	425	85	500	100
Pork, dressed	Lb.	.10	290	29	350	35
Eggs	Doz.	.15	105	16	105	16
Chickens:						
Fryers	Head	.35	25	9	25	9
Hens	Head	.60	5	3	5	3
Posts	Each	.07	50	4	50	4
Fuel wood	Cord	1.50	15	22	15	22
House rent	Year	30.00	1	30	1	30
Total				\$269.00		\$305.00

¹Based on 1935-39 prices.

²These quantities refer to amount produced and in many instances include food losses from inadequate care and management.

³Value of garden based upon farmer's estimates.

creasing income either by adding hogs or by adding more cows for butterfat production and raising heifers. The addition of more cows might fit many farms having more pasture and forage if markets for dairy products develop.

The increased yields and added corn acreage of the alternative system would increase the days of profitable employment for the family from 176 to 236 per year, thus intensifying the labor peaks in spring and fall (Figure 5). This does not make the labor peaks high enough to require hired labor. However, by hiring 20 to 25 days work done during planting and harvesting, even the more intensified business on the home farm still

TABLE 8.—Land Use and Crop Production with Present and Alternative Systems, Representative Two-Mule Cotton-Corn Farm, Marion County, Alabama.

Land use	Unit	Present system			Alternative system ¹		
		Acres	Yield	Prod.	Acres	Yield	Prod.
Cotton, lint	Lb.	7.0	293	2050	7.0	400	2800
Cottonseed	Lb.	—	440	3080	—	600	4200
Corn	Bu.	17.6	12	211	22.0	20	440
Cowpeas in corn	Bu.	(12.2)	1	12	(11.0)	1	11
Soybean hay	Ton	3.8	.7	2.7	2.0	1	2
Fall oats	Bu.	(.0)			(6.0)	25	150 ²
Cowpeas	Bu.	.0			6.0	4	24
Kudzu hay	Ton	.0			7.0	1	7
Vetch		(.0)			(10.0)	Turned under	
Garden and patches		2.4			3.0		
Idle cropland		4.4			0		
Total cropland		35.2			47.0		
Pasture		7.3			10.0		
Woodland		54.0			39.5		
Other farm land		2.0			2.0		
Total farm land		98.5			98.5		

¹Assumes improved crop and livestock practices, including per-acre fertilizer applications of or equivalent to 600 pounds of 6-8-4 on cotton, 225 pounds of nitrate of soda on corn not following winter legumes, and the increased use of improved terraces and winter cover crops.

²May be cut for hay.

TABLE 9.—Livestock Numbers and Production with Present and Alternative Systems, Representative Two-Mule Cotton-Corn Farm, Marion County, Alabama.

Item	Unit	Present system	Alternative system
Livestock:			
Workstock	No.	2	2
Cows	No.	2	3
Sows	No.	0	2
Hens	No.	35	75
Production:			
Milk	Gal.	850	1350
Calf	No.	1	1
Heifer	No.	.5 ¹	1
Pork (home use)	Lb.	290	350
Pigs	No.	2 ²	15
Eggs	Doz.	280	750
Chickens	No.	80	150

¹One heifer sold every other year.

²Two pigs bought for home meat supply.

could be handled satisfactorily and the farm family would have a third of its labor available to work off the farm.

The peak load for mule labor is better distributed with the alternative system than it is at present. The excess man and mule labor that is available during the summer and early winter

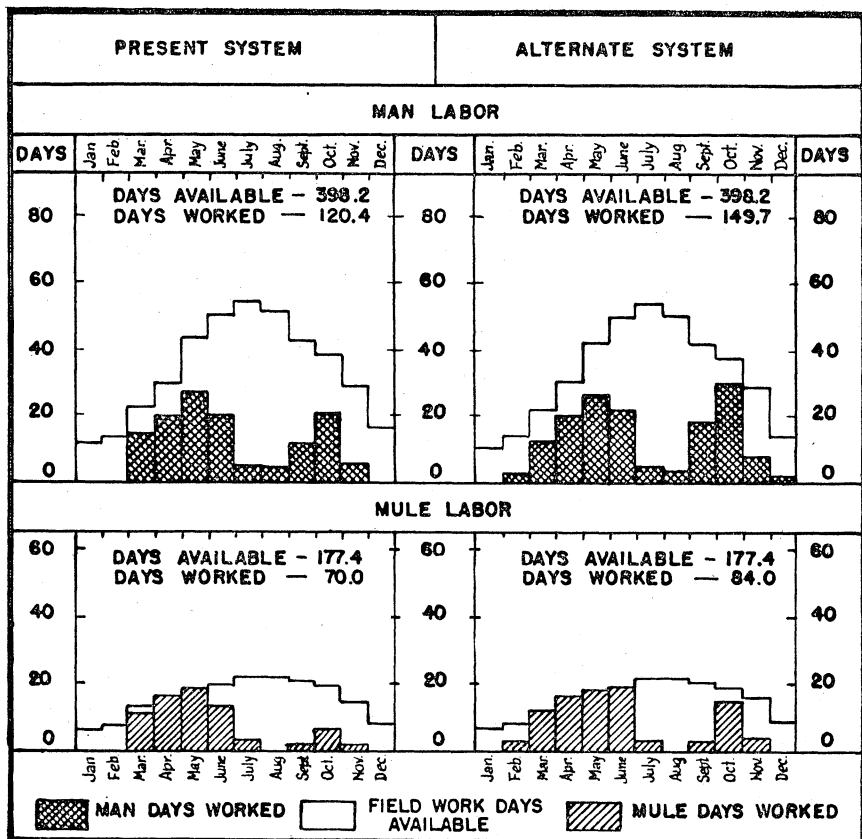


FIGURE 4.—Usual Man and Mule Labor Requirements for Field Work, Representative Two-mule Cotton-Corn Farm, with Present and Alternative System, Marion County, Alabama.

could be used to advantage on many farms in terrace building and maintenance, construction or repair of farm buildings, equipment, and fences, and cutting and hauling timber products.

A larger investment and larger annual expenditures, particularly for fertilizer, become necessary under the new system (Table 10). However, the added costs are more than offset by more than doubling the present net cash income (Table 11).

The value of the food, fuel and shelter (Table 12) obtained from the representative two-mule farm at present almost equals gross cash income (Table 11). An adequate quantity of most food items is produced on these farms but a greater variety of vegetables over a longer period of time each year would be beneficial. Some families may also find it advantageous to use beef (preserved by canning) instead of pork as a part of the meat supply.

A Representative Three-Mule Farm

Eleven per cent of the farms in Marion County have 3 mules while 8 per cent have more than 3 mules. The farms in this group are usually operated by an owner and one or more share-cropper families. Average cotton and corn yields are also slightly higher on the three-mule farms owing primarily to heavier fertilizer applications. These operators have more labor and equipment to do pasture and woodland improvement work than other farmers, but they, too, have depended almost altogether upon their cropland for income.

TABLE 10.—Cash Receipts and Expenses with Present and Alternative Systems, Representative Two-Mule Cotton-Corn Farm, Marion County, Alabama¹.

Item	Unit	Present system		Alternative system	
		Quantity	Value	Quantity	Value
Cash receipts:					
Cotton, lint	Lb.	2050	\$215.25	2800	\$294.00
Cottonseed	Lb.	2680	25.20	3800	57.00
Cowpeas	Bu.	—		11	15.40
Crop sales			\$240.45		\$366.40
Veal calf	No.	1	5.00	1	5.00
Heifer	No.	.5 ²	17.50	1	35.00
Dairy products	—		10.00		30.00
Pigs	No.	—		13	172.00
Eggs	Doz.	160	32.00	600	120.00
Chickens	No.	25	10.00	60	24.00
Livestock sales			\$ 74.50		\$386.00
AAA payment			55.00		60.00
Total cash income			\$369.95		\$812.40
Cash expenses:					
Seed and plants			17.50		31.00
Fertilizer			64.15		175.00
Ginning			14.00		21.00
Mower and rake hire			5.70		22.50
Miscellaneous			2.50		5.00
Crop expenses			\$103.85		\$254.50
Feed			13.35		45.00
Breeding fees			2.00		6.00
Purchases			6.00		
Miscellaneous			16.80		20.00
Livestock expenses			\$ 38.15		\$ 71.00
Machinery expenses			15.75		17.50
Building repairs			13.85		17.00
Fence repairs			6.00		7.50
Taxes			7.80		7.80
Interest on short-term credit			9.00		15.00
Total cash expenses			\$194.40		\$390.30
Net cash income			\$175.55		\$422.10

¹Income and expense items used in this analysis are valued at estimated average prices for the period of 1935-39.

²One heifer sold every two years.

TABLE 11.—Summary of Farm Business and Family Labor Returns with Present and Alternative Systems, Representative Two-Mule Cotton-Corn Farm, Marion County, Alabama.

Item	Present system		Alternative system	
	Dollars		Dollars	
Total cash income		370		812
Total cash expenses	194		390	
Net cash income		176		422
Depreciation	44		46	
Farm income		132		376
Interest on investment	65		66	
Net family return		67		310
Value of family living	315		336	
Non-farm income	35		35	
Family labor earnings		417		681

TABLE 12.—Value of Family Living with Present and Alternative Systems Representative Two-Mule Cotton-Corn Farm, Marion County, Alabama.

Item	Unit	Value per unit ¹	Present system		Alternative system	
			Quantity ²	Value	Quantity ²	Value
Corn	Bu.	\$.80	15.0	\$ 12	15.0	\$ 12
Cowpeas	Bu.	1.40	4.0	5	4.0	5
Garden and patches	—			70 ³		85
Milk	Gal.	.20	500	100	500	100
Pork, dressed	Lb.	.10	290	29	350	35
Eggs	Doz.	.15	105	16	105	16
Chickens:						
Fryers	Head	.35	25	9	25	9
Hens	Head	.60	5	3	5	3
Posts	Each	.07	75	5	75	5
Fuel wood	Cord	1.50	20	30	20	30
House rent	Year	36.00	1	36	1	36
Total				\$315		\$336

¹Base on 1935-39 prices.

²These quantities refer to amount produced and in many instances include food losses from inadequate care and management.

³Value of garden based upon farmer's estimates.

About 19 acres of woodland is cleared to provide the additional crop and pasture land required in the alternative system and in addition 6 acres of formerly idle cropland is put to productive use (Table 13). The additional feed provided by the proposed plan will be utilized by adding 1 cow, 1 sow, and 45 hens (Table 14).

Three-mule farms have more surplus labor than any of the other groups. The operator's family alone could operate the entire unit by hiring only 15 days of labor during the cultivating season.

The net value of the cropper's share of crops is the cost to the operator for the cropper's family labor. As now operated, this amounts to \$141 (Table 15). Sharecropper families finding employment elsewhere are not being replaced by many opera-

TABLE 13.—Land Use and Crop Production with Present and Alternative Systems¹, Representative Three-Mule Cotton-Corn Farm, Marion County, Alabama.

Land use	Unit	Present system			Alternative system ²		
		Acres	Yield	Prod.	Acres	Yield	Prod.
Cotton, lint	Lb.	10.1	302	3050	10.0	400	4000
Cottonseed	Lb.	—	452	4570	—	600	6000
Corn	Bu.	28.6	12.5	358	33.0	20	660
Cowpeas in corn	Bu.	(14.0)	1	14	(14.0)	1	14
Soybean hay	Ton.	(6.0)	.7	4.2	3.0	1	3
Fall oats	Bu.	0			(8.0)	25	200 ³
Cowpeas	Bu	0			8.0	4	32
Kudzu hay	Ton	0			8.0	1	8
Vetch		(5.0)	Turned under		(12.0)	Turned under	
Garden and patches		2.4			5.0		
Idle cropland		6.2			0		
Total cropland		53.3			67.0		
Pasture		10.8			16.0		
Woodland		75.4			56.5		
Other farm land		2.0			2.0		
Total farm land		141.5			141.5		

¹Includes both operator's and cropper's crops.

²Assumes improved crop practices, including per-acre fertilizer applications of or equivalent to 600 pounds of 6-8-4 on cotton, 225 pounds of nitrate of soda on corn not following winter legumes and the increased use of improved terraces and winter cover crops.

³May be cut for hay.

TABLE 14.—Livestock Numbers and Production with Present and Alternative Systems¹, Representative Three-Mule Cotton-Corn Farm, Marion County, Alabama.

Item	Unit	Present system	Alternative system
Livestock:			
Workstock	No.	3	3
Cows	No.	2	3
Sows	No.	1	2
Hens	No.	30	75
Production:			
Milk	Gal.	750	1350
Calf	No.	1	1
Heifer	No.	.5 ²	1
Pork (home use)	Lb.	290	350
Pigs	No.	6	15
Eggs	Doz.	240	750
Chickens	No.	60	150

¹Includes only the operator's livestock.

²One heifer sold every other year.

tors. The number of sharecroppers reported in the 1940 Census was 44 per cent below 1935. The sharecropper family on the three-mule farm can benefit by the reorganization (Table 15). The net cash income of the sharecropper can be increased from \$141 to \$215 by following the alternative system for this part of the farm business. Since acreage shifts are only slight, most of the increased income would result from increased yields.

TABLE 15.—Cropland Worked by Cropper, Cropper's Livestock, and Value of Cropper's Share of Products Produced and Expenses Paid with Present and Alternative Systems, Representative Three-Mule Cotton-Corn Farm, Marion County, Alabama.

Item	Present system	Alternative system
	Acres	Acres
Crops:		
Cotton	4.7	4.5
Corn	10.5	11.0
Cowpeas in corn	(3.5)	(6.0)
Cowpeas	.0	4.0
Soybean hay	1.4	3.0
Garden and patches	0.9	2.0
Total cropland	17.5	24.5
Livestock:	Number	Number
Cows	1.0	2.0
Pigs	2.0	2.0
Hens	20.0	30.0
	Dollars	Dollars
Value of cropper's share of crops and AAA payments	160	270
Cropper's share of crop expenses	19	55
Net value of cropper's share of crop	141	215

Operators on three-mule farms have approximately \$176 after all necessary cash expenses and the cropper's share have been deducted (Table 16). If allowances for depreciation and interest are subtracted, there is only \$2.00 left as payment for the operator's labor and management and his unpaid family labor. Obviously these farmers have great difficulty in replacing buildings and equipment, and in making needed farm improvements. Net cash income can be increased from \$176 to \$479 with the alternative system when the cropper stays on the farm. The net family return can be increased from \$2 to \$280. Under the alternative system if the cropper should leave the farm, and the net value of the cropper's share of crops and AAA pay-

TABLE 16.—Summary of Farm Business and Family Labor Returns with Present and Alternative Systems, Representative Three-Mule Cotton-Corn Farm, Marion County, Alabama¹.

Item	Present system	Alternative system
	Dollars	Dollars
Total cash income	578	1,188
Total cash expenses	402	709
Net cash income	176	479
Depreciation	68	77
Farm income	108	402
Interest on investment	106	122
Net family return	2	280
Value of family living	300	338
Non-farm income	25	25
Family labor earnings	327	643

¹These figures refer to the operator only.

ments were added to the operator's net cash income, it would increase from \$176 to approximately \$695.

General Considerations in Developing Alternative Systems

Most of the current crop and livestock practices are such that a low level of production is common for most enterprises. Improvements will involve more effective tillage, planting, fertilizing, and feeding. Present crop and livestock practices are shown in Tables 17 and 18. Most farmers will find it necessary to make these changes slowly and in line with some definite plan. At least 5 years probably will be required to put these changes into effect. Kudzu, an important hay crop in the alternative systems, requires three years at least before a full crop of hay can be harvested. A high proportion of the Marion County farmers will need technical assistance to effectively improve pastures, construct improved terraces, grow kudzu, improve woodlands, and make other needed improvements. Tenants face more difficulties than owner operators in making the

TABLE 17.—Normal Yield, Usual Seeding Rates, and Usual Kinds and Rates of Fertilizers Used for Specified Crops, Marion County, Alabama.

Crop	Yield		Seeding rate			Fertilizer	
	Unit	Normal	Unit	Normal	Per cent purchased	Kind	Rate per acre
Cotton	Lb.	290	Bu.	1.2	45	6-8-4	230
Corn (alone)	Bu.	12	Bu.	.2	14	6-8-4	100
						Soda	75
Corn (interplanted)	Bu.	13	Bu.	.2	14	6-8-4	100
						Soda	75
Soybean hay	Lb.	1400	Bu.	.5	100	None	—
Cowpea hay	Lb.	1000	Bu.	1.7	48	None	—
Oats (alone) ¹	Bu.	14	Bu.	2.0	100	Soda	75
Vetch	Lb.	²	Lb.	26.0	100	None	—
Crimson	Lb.	²	Lb.	26.0	100	None	—
A.W. Peas	Lb.	²	Lb.	32.0	100	None	—
Peanuts (non-com.)	Bu.	30	Bu.	1.3	0	Phos.	190
Sweet potatoes	Bu.	95	Plt.	4300.0	50	6-8-4	285
Sorghum (syrup)	Gal.	60	Lb.	6.0	0	6-8-4	240

¹Oats (grown alone) were cut and fed unthreshed. The above yield figures are for spring oats and are farmer estimates.

²Normal yields for winter legumes were not obtained.

TABLE 18.—Feed Normally Fed to Workstock, Milk Cows and Hogs, Marion County, Alabama.

Kind of feed	Unit	Work stock	Hogs	Milk cow and calf ¹
Corn	Bu.	54	21	13
Cottonseed meal	Lb.	—	50	1103
Cottonseed hulls	Lb.	—	—	484
Hay	Ton	1.4 ²	—	.9
Pasture days:				
Native	Days	271	274	329
Crop aftermath	Days	26	26	35

¹Occasionally fodder is substituted for part of the hay and cottonseed for a part of the meal and hulls.

²Includes some cottonseed hulls.

desired changes. In many cases, systems of rent payment will need to be revised before a greater proportion of income comes from livestock and livestock products. More extensive use of the long term lease will help tenants in carrying out long-term plans such as those which have been presented.

Crop Practices.—The improved practices in each of the alternative systems are intensifications of cropping practices already being followed to some extent; but there is variation in present practices on the different sizes of farms.

The adoption of the alternative systems involves additional outlays and at first greater risks, but over a period of years, the changes will benefit most farmers. However, simply carrying out the improved practices does not constitute the entire job. Improved cropping systems, made possible by larger cropland acreages, are very important factors in yield increases (Table 19). These systems include vetch followed by corn, oats followed by either cowpeas or annual lespedeza, and a rotation of cotton followed by vetch to be turned under and followed by corn on land which will produce good yields of cotton or corn. The increased use of winter cover crops for green manure is an outstanding feature of the improved cropping systems.

TABLE 19.—Present Yields Compared with Yields under Alternative Systems for Representative One-, Two-, and Three-Mule Farms, Marion County, Alabama.

Crop	Yields per acre with present system			Yields per acre with alternative system
	One-mule	Two-mule	Three-mule	All sizes of farms
Cotton (Lb. lint)	268	293	302	400
Corn (Bu.)	11	12	12.5	20
Hay (Lb.)	1,400	1,400	1,400	2,000

Livestock Practices.—Livestock practices included in the alternative systems are concerned primarily with improved feeding practices and increased numbers of livestock. The introduction of protein supplements into the hog ration enables greater gain per bushel of corn. It was assumed that approximately 6 pounds of protein supplement would be fed per bushel of corn. Greater quantities of skim and buttermilk would be fed to chickens and hogs in order to furnish a balanced ration. The increased number of pigs farrowed and raised would efficiently use the additional amount of corn. Improved pastures and increases in feed and forage crops would be available for feeding more adequately the increased number of dairy cattle.

Woodland Practices.—Forestry technicians report that, on the average, the cubic foot volume of present stands can be more than doubled. Growth rates can also be doubled if such areas are placed on sustained yield bases. To achieve these conditions, however, will require from 30 to 40 years of improved farm woodland management.

Two principal practices¹ are (1) protection from fire and grazing, and (2) improved woodland practices, including (a) thinning, release cutting, and removing or girdling undesired trees, as necessary; (b) spot planting large openings which appear from cutting undesired trees; and (c) selective logging as trees become 16" diameter-breast-high, if growth indicates they should be cut. In addition, all undesired trees which cannot be used should be cut, hacked and lopped over, or girdled.

SUMMARY

Marion County is an Upper Coastal Plains farming area in which the productive capacity has been lowered by a cotton-corn system of farming that omitted adequate conservation practices. The gap between population needs and farming resources is slowly widening. Farm ownership has been decreasing steadily, and the one- and two-mule small units have become more common. These trends may be reversed by more fully utilizing farm resources, by taking advantage of outside opportunities for employment, and by further developing local industries — mining or manufacturing.

Some possibilities for fuller utilization of farm resources have been considered in this analysis. Cotton continues as the most profitable intensive enterprise but it is evident that the present cotton-corn systems on small farms (one- and two-mule units) cannot adequately support a family. Net cash incomes (1935-39 prices and usual yields) for representative one-mule farms are \$102, and for representative two-mule farms \$176. The net cash incomes resulting from the alternative systems are \$186 and \$422, respectively, for the one- and two-mule farms. Cropland area of these groups was 35 acres or less and more than 80 per cent of the operating units are in these groups.

Nearly one-third of the County's farm land is used for growing crops, one-half of which is in corn, one-fourth in cotton, one-tenth in hay crops, and most of the small remaining acreage in farm gardens and scattered patches of minor crops for home use. Soybeans are used as the principal hay crop. Less than five per cent of the cropland is planted in winter legumes.

More than 50 per cent of the farm land is badly depleted farm woodland. Woodlands now furnish little employment or income, and production rates are far below the estimated potential productive capacity. Pastures are generally small, of poor quality, and of low carrying capacity.

Tenants, of which one-fourth are share-croppers, operate 50 per cent of all farms in the County. Nearly 98 per cent of all operators are white.

One-, two-, and three-mule units make up nearly 90 per cent of all farm operating units in the County, one-third of which are one-mule, one-half two-mule, and the remaining number three-

¹Improved farm woodland practices as outlined by forestry technicians of the Soil Conservation Service.

mule units. One-mule units average 22 acres of cropland, two-mule units 35, and three-mule units 53. Most one- and two-mule units are worked by the operator and his family labor; whereas, most three-mule units are worked by the operator and his family plus the additional labor of one sharecropper family.

Crop sales are confined largely to cotton and cottonseed, and on many farms these are the only sources of cash income. Most livestock and livestock products are produced for home use, although occasional sales of butter, eggs, and chickens are made to "rolling stores". The value of food, feed, and shelter from the farm often exceeds total cash income and more than doubles net cash income on many farms. Non-farm employment opportunities are limited to coal mining, public works projects, and a few scattered sawmills.

At least four months of the year, farm family labor is idle except for chores, and in only a few months is there employment for half the available labor. Mule labor is utilized to capacity during March, April, and May, but during the remaining nine months of the year, it is utilized very little. In the organization and operation of farms mule labor is more of a limiting factor than man labor.

All major crops grown in this county are, to some extent, competitive with cotton in their demands for land, labor, and equipment.

Principal changes needed to bring about improvements in farm returns include:

1. Full utilization of all available cropland, including idle cropland and parts of the present woodland.

2. Improvement of present pasture and farm woodland areas.

3. Introduction of crops not now generally grown in this county, especially fall oats, winter legumes, kudzu, sericea, and annual lespedeza.

4. Increase in yields of all crops by the use of suitable varieties, heavier applications of manures and approved fertilizers, improved cultural practices, and the use of more legumes.

5. Use of summer legumes to follow small grain and provide summer cover for the land, food (cowpeas) for the farm family, and grazing and forage for livestock.

6. Increase in the acreage and production of land devoted to gardens and patches to provide a more adequate diet for farm families throughout the year.

7. Increase in number and production rates of livestock as feed supplies are increased.

8. Use of better management practices, including such conservation measures as terracing, planting perennial legumes on steep slopes, and the use of winter and summer legumes.

9. Home production of seed.

10. Increased and more efficient utilization of surplus farm labor.

