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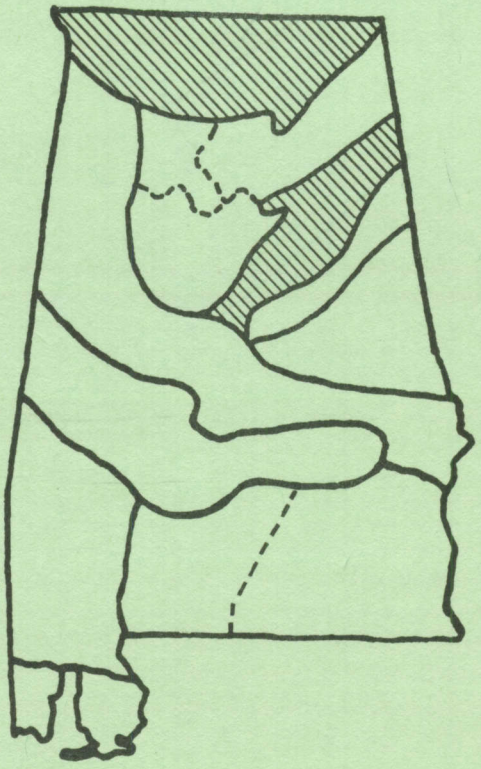
MINIMUM OPEN LAND REQUIREMENTS FOR SPECIFIED FARM INCOMES LIMESTONE VALLEY AREAS ALABAMA



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The overall purposes of this regional project are (1) to provide guides to farmers when choosing among alternative production opportunities, especially as those opportunities are affected by changes in prices and technology, and (2) to provide guides to persons engaged in developing and administering public agricultural programs.

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SUMMARY

The objectives of this study were to determine the minimum acreage of open land that would be required for specified levels of labor and management income under various price and allotment levels. It was also planned to determine the level of adjustment that would be required in the number of farms in the area if all farms were increased to a size that would yield the specified incomes.

The area to which the study applies is the Tennessee Valley of Alabama plus irregular strips of valley and flood plain soils in several other northeastern Alabama counties. The soils of the area are above average in natural fertility and are capable of producing good crop yields if improved management practices are used. Cotton is the major cash crop.

The procedure for the study was: (1) to determine the open land acreage in the area; (2) to develop enterprise budgets for various crops and livestock activities; (3) to determine the minimum open land requirement and the optimum enterprise organization for various price, allotment, and enterprise considerations, for a $5,000-operator labor and management return; (4) to determine as in objective 3 for selected comparisons at a $7,000-return; and (5) to determine the reduction in number of farms required if all farms were large enough to yield the desired income level.

Crop budgets were developed for cotton, corn, oats, wheat, soybeans, grain sorghum, alfalfa hay, and lespedeza hay. Livestock budgets were developed for hogs, cow-calf, and steer feeding enterprises. Minimum open land requirements for a $5,000-net return were determined with

(1) all the activities considered and (2) hogs and steers not considered. With all activities considered, the minimum requirements were determined for five land value levels, twelve cotton price and allotment combinations and three labor prices. With hogs and steers not considered, the minimum requirements were determined for four land value levels. Minimum requirements for a $7,000-income were determined with all activities considered for two cotton prices, two cotton allotment levels and two land values.

The minimum open land required to yield a $5,000-return to operator labor and management ranged from 85 acres to 175 acres. The 85 acres were associated with the situation where all enterprises were considered and no return to land was charged. The 175 acres were associated with the situation where hogs and steers were not considered and the return to land was based on a value of $400 per acre. For the base situation (1963 level for all prices and allotments and all activities considered) the minimum open land requirement to obtain the $5,000-income was 98.2 acres.

With all activities considered, increasing the land charge from no interest to interest on a value of $400 per acre (double the current value) increased the minimum requirement from 85 acres to 117 acres. Since very little hired labor was required to operate this size farm, doubling the wage rate only increased the minimum requirement by 2 acres. No cotton entered the optimum organization at prices of 20.8 and 26 cents per pound of lint. At 31.2 cents per pound, cotton was in the optimum organization. With cotton in the organization, increasing the allotment level or the price level decreased the minimum requirement to obtain the income level.

For a $7,000-income, the minimum open land required for the base situation was 130.3 acres, an increase of 32 acres over the requirement for $5,000 for the same situation. Changing the cotton allotment level, cotton price or land value appeared to have the same affect at the $7,000-level as at the $5,000-level.

With all activities considered, enterprises in the optimum organizations were oats, corn, cotton, beef cows, and hogs with cotton not entering the organization at low cotton prices. When hogs were excluded from consideration, alfalfa hay replaced the corn and hog enterprises.

Using a farm size distribution determined from 1959 Census of Agriculture and other data, it was estimated that over 78 per cent of the farms in the study area had fewer than the 85 acres of open land which was the minimum required for any of the situations. For the largest requirement determined (175 acres), over 92 per cent of the farms in the area has fewer acres than the minimum required.

If all the land in the area were adjusted into farms of the 85-acre size required to yield a $5,000-income, the minimum reduction in farm numbers would be 13 per cent. However, if only those farms below 85 acres made adjustments and those above this size remain at their current level, the minimum reduction in farm numbers would be 48 per cent. For the 175-acre farm, the minimum reduction in farm numbers if all land were adjusted into farms of this size would be 58 per cent. If only those farms below 175 acres made adjustments, the minimum reduction required would be 69 per cent.

MINIMUM OPEN LAND REQUIREMENTS FOR SPECIFIED FARM INCOMES, LIMESTONE VALLEY AREAS, ALABAMA

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In studying farming adjustment alternatives, one consideration is whether to farm or go into nonfarm employment. In a full employment economy, there is competition for labor. The income to persons of a given skill and training in nonfarm employment could be considered the "opportunity cost" of farming. Thus with all things equal, a farmer should desire a return to his labor equal to the wages paid for similar labor in nonfarm employment. However, the farmer may have some compensating benefits that would entice him to accept a lower return than obtainable in nonfarm employment.

In making economic decisions along these lines, individual farmers can use information about the quantities of open land and other resources needed to yield a specified operator labor and management return. Likewise, farmers and farm leaders are interested in the effect such adjustments in farm size and resource use could have on the number of farms and farm people.

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The purposes of the study upon which this report is based were:

(1) To determine the minimum open land requirements to obtain a $5,000 return to operator's labor and management using advanced technology and specified cotton price and allotment levels;

(2) To determine the minimum open land requirements to obtain a $7,000-income for certain assumptions for comparison with the $5,000 results;

(3) To determine the optimum combination of enterprises consistent with the assumptions and minimum land requirements;

(4) To determine the amounts of other resources (labor and capital) required by these enterprise organizations; and,

(5) To determine the number of farms currently below the minimum size and the number of farms that could exist in the area if these farms were reorganized into farms of the minimum size.

Description of the Area

The farming area designated in this study as the Limestone Valleys consists of the Tennessee Valley Area plus irregular strips of valleys and flood plains in several other northeastern Alabama counties, Figure 1. The soils of these areas are of limestone origin or have characteristics similar to the limestone soils. They are above average in natural fertility as compared to other soils in the State. The nearly level to gently rolling topography of the Limestone Valley soils is quite adaptable to mechanization. A large percentage of the land is open and cultivation is intensive.

The area receives an annual rainfall ranging from 50 to 56 inches. However, this rainfall is usually distributed so that it is relatively dry in the late spring and early fall. The growing season for the area ranged from 200 to 220 days (4).[1]

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[1]Number in parenthesis refers to reference cited. See list at end of this report.

Fig. 1. Area of study, Limestone Valleys

Cotton, the leading cash crop for the State, is also the most important crop in the area. Forty-seven per cent of Alabama's cotton production, or 2.2 per cent of the U. S. cotton production in 1962 was produced in the Limestone Valleys. Other major crops in the area include corn and hay crops.

Method of Analysis

Linear programming was used to determine the optimum combination of enterprises that would require the least amount of open land to obtain the $5,000-operator's labor and management return. The programming technique also indicated the quantity of labor and capital which would be required to operate this combination of enterprises.

The decision to determine the minimum open land required to yield the income was made because scarcity of open land is usually the most limiting factor on small farms. Land is the major capital item on most farms, therefore, the result when land is minimized would be almost the same as would be obtained if capital were minimized. Also, land prices are very flexible. In land transactions, factors other than economic value often play a role in determining the selling price. Minimizing the land requirement places less pressure on determining an accurate land price.

Census data on farm size distributions by acres of cropland harvested and by total acres of land were used to determine a farm size distribution by open land acreage. From these data, a cumulative distribution of open land by percentage and size of farm was determined. This distribution was used to determine the number of farms with fewer acres than the minimum required to yield a specified income and the acreage of open

land on these farms. This open land acreage was divided by the acreage required to produce the desired number of farms of the minimum size which could be reorganized on this acreage. The difference between the number of farms now in the area below the required size for the specified income and the number of the minimum size which could be reorganized on this acreage is the adjustment gap in farm numbers required to raise all farm operator's labor and management return to $5,000.

Basic Assumptions

Input-output budgets used in this study were based on improved management practices, which assume the use of the best technology available and a high level of managerial ability. These budgets were developed by modifying cost and return budgets previously published for the area to meet the specific assumptions of this study (3, 5). The assumed yields represent the output that might be expected under the assumed level of management practices and average weather conditions, Table 1.

Land

The acreages of land and their use capabilities as used in this study were based on Soil Conservation Service Data (1). Only open land from which crops or pasture could be harvested was considered in the analysis. The assumption was made that all land in capability classes I through IV, which was being used for cropland or pasture in 1961, could be adjusted to its best alternative use. Therefore, all land in these categories was defined as open land, Table 2. Class I and II land was considered as suitable for row crops year after year. Classes IIIe and IIIw were considered suitable for row crops one year out of two. Therefore,

Table 1. Assumed Crop Yields Per Acre, Limestone Valley Areas, Alabama

Crop	Unit	Limestone Valley Areas
Cotton, lint	Lb.	700.0
Corn	Bu.	65.0
Oats	Bu.	70.0
Grain sorghum	Bu.	45.0
Alfalfa	Ton	4.5
Lespedeza	Ton	2.0
Soybeans	Bu.	22.0
Corn silage	Ton	12.0

total available row cropland was all class I and class II cropland and pasture and one-half of class IIIe and IIIw cropland and pasture. The remaining one-half of the class IIIe and IIIw land was considered as plowable land not suitable for row crops. All of the class IV land was designated as nonplowable land suitable only for permanent sod crops.

There were 1,607,890 acres in the Limestone Valleys which met the definition for open land. Of this, 69 per cent could be classified as row cropland, 21 per cent plowable land not suitable for row crops and 10 per cent as suitable only for permanent sod crops. Of this acreage, 43,765 were in enterprises not considered for adjustment possibilities in the study. These acreages were excluded from the adjustment base, leaving a total of 1,564,125 acres of open land for consideration in this study.

Table 2. Soil Base Acreage, by Current Use and Capability Class, Soil Classification Used in This Study, Limestone Valleys, Alabama*

Class	Current use	
	Cropland	Pasture
	Acre	
I	114,925	26,898
IIe	543,673	104,022
IIw	40,859	8,593
IIIe	239,097	93,734
IIIs	42,511	20,168
IIIw	156,467	63,559
IVe	50,526	43,518
IVw	27,667	31,673
Total	1,215,725	392,165

Classification for Study	Definition		Acreage
Open land	Class I through IV cropland and pasture		1,607,890
Plowable land	Class I, II and III cropland and pasture		1,454,506
Row cropland	Class I, II and 1/2 Class IIIe and IIIw cropland and pasture		1,115,397
	Excluded acreage		
	Dairy farms	27,500	
	Vegetables, fruits and nuts	7,000	
	Nonfarm rural residences	9,265	
	Total excluded acreages	43,765	
Open land considered for adjustment			1,564,125

*Based on estimates from: State Soil Conservation Committee, Alabama Soil and Water Conservation Needs Inventory, Alabama 1961.

Capital

Interest, at 6 per cent, was charged on all operating capital and investment capital, other than land, required in the farm organizations. Operating capital was expenditures which would be recovered in less than 1 year. Interest on this capital was charged for the time between the actual expenditure and the sale of some product to recover the expenditure. No interest was charged for expenditures that could be recovered in less than 30 days.

Investment capital included all expenditures that would be invested more than 1 year, such as breeding herds, buildings, fences, and feeders. Interest on this capital was charged on the average value over its life rather than the new cost.

To determine a return to operator labor and management, a return to land of 5 per cent of its agricultural value was charged. With information obtained from surveys in the area, the base value of a typical acre of open land was set at $200 per acre. For specified situations, the value of an acre of open land was varied from a free or no charge situation to a value of $400 per acre.

Labor

The operator was assumed to be available for 2,817 hours of productive labor each year. The total hours were determined by considering length of days, normal rainfall patterns, holidays, and other factors. These hours were distributed by time periods. Any other seasonal labor required by any of the enterprises was hired at a base rate of 60 cents per hour. If any organization had required it, other full-time resident labor could have been hired at a base rate of $1 per hour.

To evaluate the possible effect of increasing wage rates for hired labor, situations were specified with the wage rate at 50 per cent and 100 per cent above the base rate.

Enterprise Activities

The enterprises used in the programming model are all land-based activities. Land based means that the enterprise would require the use of some quantity of open land as defined in this study for the production of the commodity. Cotton, corn, soybeans, wheat, oats, grain sorghum, lespedeza hay, and alfalfa hay were crop enterprises considered. Steer feeding, a sow-pig operation, and a cow-calf enterprise were the livestock activities considered.

Several possible enterprises were not considered for various reasons. Production of vegetables, fruits, or nuts is possible in the area studied. However, the specialized management, labor, and equipment required and market uncertainties limit the consideration of these enterprises. Grade A milk production can be very profitable in the area. However, the overall supply and marketing situation is such that limited opportunity for entrance into Grade A milk production exists. Poultry production now exists in the area. However, poultry production does not require extensive use of open land and the use of poultry enterprises would be determined by markets as well as available labor and capital rather than land.

All of these excluded activities, and probably others not mentioned, could be profitable adjustment alternatives for individual farmers. However, because of their limited adjustment possibilities, they cannot be considered as possibilities for wide-scale area adjustments.

Allotment and Rotational Restrictions

Cotton was the only enterprise for which acreage allotments were considered. The 1963 acreage allotment converted to a percentage of the open land on the farm was considered the base allotment level. For specified situations the allotment level was set at 55, 85, 100, and 115 per cent of the base level.

Wheat allotments were not used but the production was limited to 15 acres per farm. The acreage allotment program in 1963 permitted this acreage on any farm without an allotment. Alfalfa hay production was not restricted, but the land was required to be in fallow one year in five to allow for establishment.

Prices

Input prices used in the study were determined from a survey of farm supply and equipment dealers in the Limestone Valleys, Appendix A, Table 2. Product prices, except for cotton, were assumed as current prices adjusted for trend and cycle, Appendix A, Table 1. They were determined from 5-year (1958-1962) monthly averages taken from Alabama Agricultural Statistics (2). The cotton price was varied from 20.8 cents to 36.4 cents per pound of lint to correspond to the varying cotton allotment level. The assumed current cotton price was 31.2 cents per pound of lint.

The assumed current land price was estimated on the basis of a survey of selected county agents, Farmers Home Administration supervisors, and land appraisers in the area. The price determined represents the value of an acre of open land with no improvements. No value was determined for woodland and wasteland. The value determined was used to compute a return to land investment. This return was 5 per cent of the

stated value. In the analysis, the return to land was varied from zero to a return based on a land value 100 per cent above the estimated current value.

Machinery

The farm operator was assumed to own a three-plow tractor and land preparing and cultivating equipment, Appendix A, Table 3. He was also assumed to own haymaking equipment and a cornpicker. Cotton, small grain, and grain sorghum were assumed to be custom harvested.

Overhead Cost

General farm expenses that could not be charged to a specific enterprise were classified as general overhead costs. These costs were deducted from gross farm sales before the return to operator labor and management was determined. These costs included such items as telephone, bookkeeping, liability insurance, and truck use, Appendix A, Table 4. Also charged as general overhead were interest, taxes, and housing for the machinery, and real estate taxes at the rate of $1 per acre. Insurance on livestock, buildings and machinery sheds was charged to the livestock enterprise or included in machinery housing charge.

Minimum Open Land Requirements

Minimum land requirements and optimum enterprise organizations that would yield a $5,000-return to operator labor and management were determined for five land value levels considering two sets of enterprise possibilities. With one enterprise possibility set, the minimum requirements were determined for 12 cotton price and allotment combinations and for three labor price levels. Also minimum requirements to yield a $7,000-operator return were determined for four situations.

At the $5,000-level, the five open land values used were (1) full ownership (no charge); (2) $100 per acre; (3) $200 per acre (the estimated current value); (4) $300 per acre; and (5) $400 per acre. The labor price levels were (1) base - $1.00 for regular labor and $0.60 per hour for seasonal labor, (2) 50 per cent above base, and (3) 100 per cent above base. The cotton allotment levels were 55, 85, 100, and 115 per cent of the 1963 allotment acreage. Cotton price levels were 20.8 cents, 26 cents, 31.2 cents, and 36.4 cents per pound of lint. Enterprise possibilities included (1) all enterprises and (2) all enterprises except hogs and steers. For a $7,000-return, situations were (1) 100 per cent allotment, 31.2 cents cotton, $200 per acre land; (2) 85 per cent allotment, 31.2 cent cotton, $200 per acre land; (3) 100 per cent allotment, 26 cent cotton, $200 per acre land; and (4) 100 per cent allotment, 31.2 cent cotton, $400 per acre land.

The complete farm organization and farm business summary for each of the assumed situations are presented in Appendix B. The minimum open land requirements and enterprise organizations will be discussed in this section.

The situation which most nearly approximates current conditions is the 100-per cent allotment level, 31.2 cent cotton price, $200 per acre of open land and base labor prices with all enterprises considered. In the following discussion this situation will be designated as the base situation. The discussion will be concerned with changes that occurred as one or more of the base assumptions changed.

Effect of Changing Land Value

The base situation required 98.2 acres of open land to yield the $5,000-return to operator labor and management, Table 3. With all

Table 3. Estimated Minimum Open Land Requirements and Enterprise Organization for a $5,000-Return to Operator Labor and Management, Specified Land Values and Enterprise Considerations, 31.2 Cent Cotton Price, 1963 Cotton Allotment Level, Labor Prices, Limestone Valley Areas, Alabama

Enterprise consideration and optimum organization	Unit	Land value per acre				
		$0	$100	$200[a]	$300	$400
All enterprises considered						
Total open land	Acre	84.7	90.9	98.2	106.7	116.9
Cotton	Acre	15.2	16.4	17.7	19.2	21.0
Corn	Acre	39.6	42.5	46.0	50.0	54.8
Oats	Acre	14.0	15.0	16.2	17.6	19.3
Pasture	Acre	15.9	17.0	18.3	19.9	21.8
Cows	No.	3.6	3.9	4.2	4.5	5.0
Sows	No.	15.1	16.2	17.5	19.1	20.9
Hogs and steers not considered						
Total open land	Acre		122.2	135.8	152.8	174.6
Cotton	Acre		22.0	24.4	27.5	31.4
Oats	Acre		25.7	28.5	32.1	36.7
Alfalfa	Acre		50.2	55.7	62.7	71.6
Pasture	Acre		11.7	13.3	14.8	17.0
Fallow open land	Acre		12.6	13.9	15.7	17.9
Cows	No.		5.2	5.8	6.5	7.4

[a]Base program which most clearly represents 1963 conditions.

enterprises considered, the open land requirement decreased to 84.7 acres if no land charge was made and increased to 116.9 acres with a land charge based on a value of $400 per acre. The optimum farm organization for each of these situations included cotton to the allotment limit, corn for feed, oats for sale, beef cows, brood sows, and pasture. As the open land requirement changed, the relative mixture of these enterprises remained constant.

With hogs and steers not considered as enterprise possibilities, the open land requirement at the base situation increased 37.6 acres to

135.8 acres. With a land charge based on $100 per acre land value, the open land requirement without hogs and steers was 122.2 acres and based on a $400 per acre land value, the requirement was 174.6 acres. Cotton, oats, and beef cows were still in these optimum organizations. Alfalfa hay replaced the corn and hog enterprises with the restriction that some alfalfa land had to remain fallow. There was no relative change in enterprise combination as the open land requirement increased.

Effect of Changing Labor Price

The farm organization at the base situation required very little seasonal hired labor and no regular hired labor. Therefore, changing the wage rate had very little effect on the open land requirement, Table 4. The minimum open land required to yield the $5,000-return increased less than 2 acres when the wage rates were doubled. There was no effect on the relative relationship of the enterprise organizations.

Effect of Cotton Price and Allotment Levels

At a cotton price of 20.8 cents and 26 cents per pound of lint, no cotton entered the optimum farm organization at any allotment level, Table 5. The minimum open land requirement to yield the $5,000-return was 105.7 acres. The optimum organization included oats, corn for feed, hogs, and beef cows.

With the 31.2 cent and 36.4 cent cotton price, cotton was produced in the optimum organization to the limit of the allotment level. At each price level, the open land requirement decreased as the allotment level increased. At 31.2 cents per pound of lint, the minimum open land requirement decreased from 101.4 acres at the 55 per cent allotment

Table 4. Estimated Minimum Open Land Requirements and Enterprise Organization for a $5,000-Return to Operator's Labor and Management, Specified Labor Prices, Base Land Price, 31.2 Cents Per Pound of Lint Cotton, 100 Per Cent Allotment, Limestone Valley Areas, Alabama

Item	Unit	Labor price per hour		
		Base[a]	Base plus 50 per cent	Base plus 100 per cent
Total open land	Acre	98.2	99.1	100.1
Cotton	Acre	17.7	17.8	18.0
Corn	Acre	46.0	46.4	46.9
Oats	Acre	16.2	16.4	16.5
Pasture	Acre	18.3	18.5	18.7
Cows	No.	4.2	4.2	4.2
Sows	No.	17.5	17.7	17.9

[a]Base prices were $0.60 per hour for seasonal hired labor and $1.00 per hour for regular hired labor.

level to 97.1 acres at the 115 per cent allotment level. At 36.4 cents per pound of lint, the minimum requirement decreased from 96.0 acres at the 55 per cent level to 89.2 acres at the 100 per cent level.

Effect of Increasing Income Target

When the income target was increased to $7,000, the minimum open land required at the base assumptions was 130.3 acres, Table 6. This was an increase of 32.1 acres from the minimum required at the $5,000-income level. At the $7,000-income level, reducing the cotton allotment to 85 per cent increased the minimum open land requirement by 1.4 acres, compared to a 1-acre increase for similar situation at the $5,000-income level. At the $7,000-level reducing cotton price to 26 cents increased the minimum open land requirement by 13 acres compared to an increase of 7.5 acres at the $5,000-level. Also, at the $7,000-level, increasing the land value to $400 per acre increased the minimum requirement by

Table 5. Estimated Minimum Open Land Requirements and Enterprise Organization For a $5,000-Return to Operator's Labor and Management, Specified Levels of Cotton Prices and Allotments, Base Land and Labor Prices, Limestone Valley Areas of Alabama

Item	Unit	Allotment level (percentage of 1963 allotment)			
		55	85	100	115
Cotton price[a]					
20.8 cents					
Total land	Acre			105.7	105.7
Cotton	Acre			0.0	0.0
Corn	Acre			66.9	66.9
Oats	Acre			15.8	15.8
Pasture	Acre			23.0	23.0
Sows	No.			25.5	25.5
Cows	No.			4.5	4.5
26.0 cents					
Total land	Acre		105.7	105.7	105.7
Cotton	Acre		0.0	0.0	0.0
Corn	Acre		66.9	66.9	66.9
Oats	Acre		15.8	15.8	15.8
Pasture	Acre		23.0	23.0	23.0
Sows	No.		25.5	25.5	25.5
Cows	No.		4.5	4.5	4.5
31.2 cents					
Total land	Acre	101.4	99.2	98.2[b]	97.1
Cotton	Acre	10.0	15.2	17.7	20.1
Corn	Acre	55.0	48.9	46.0	43.1
Oats	Acre	16.1	16.2	16.2	16.3
Pasture	Acre	20.3	18.9	18.3	17.6
Sows	No.	21.0	18.7	17.5	16.4
Cows	No.	4.3	4.2	4.2	4.1
36.4 cents					
Total land	Acre	96.0	91.4	89.2	
Cotton	Acre	9.5	14.0	16.1	
Corn	Acre	52.0	45.0	41.8	
Oats	Acre	15.2	14.9	14.8	
Pasture	Acre	19.3	17.5	16.5	
Sows	No.	19.9	17.2	16.0	
Cows	No.	4.1	3.9	3.8	

[a]Per pound of lint.

[b]Base program.

Table 6. Estimated Minimum Open Land Requirements and Enterprise Organization for a $7,000-Return to Operator Labor and Management, Specified Cotton Allotments (Percentage of 1963 Allotment) Cotton Price (Cents per Pound of Lint) and Open Land Value Per Acre, Limestone Valley Areas, Alabama

Item	Unit	Situation			
		100 per cent allotment, 31.2 cent cotton, $200 land	85 per cent allotment, 31.2 cent cotton, $200 land	100 per cent allotment, 26 cent cotton, $200 land	100 per cent allotment, 31.2 cent cotton, $400 land
Total open land	Acre	130.3	131.7	143.3	155.2
Cotton	Acre	23.5	20.2	10.0	27.9
Corn	Acre	61.0	64.9	81.5	72.7
Oats	Acre	21.5	21.5	22.3	25.7
Pasture	Acre	24.3	25.1	29.5	28.9
Beef cows	No.	5.5	5.6	6.1	6.6
Sows	No.	23.3	24.8	31.1	27.7

24.9 acres compared to an increase of 18.7 acres at the $5,000-income level.

The increase in income target caused no change in the combination of enterprises used in the farm organization. The larger income requirement did increase the minimum open land required to yield the income and increased the magnitude of the changes required by changing the basic assumptions.

Adjustment in Farm Numbers

The farm problem has been defined by many people as simply a problem of too many small farms. The suggested solution has been to moye people out of agriculture until those remaining have enough resources to obtain a decent income. If all farms in the area were large enough to yield a $5,000-operator labor and management return, what would be the effect on the number of farms in the area?

Two assumptions were made about the adjustment path taken by farmers in the area. The first assumption was that all open land in the area could be reorganized into farms of exactly the minimum size required to produce the income target. This would give the maximum possible number of farms in the area that could produce the desired income for every farmer. The second assumption, somewhat more realistic, is that the farms presently at or above the minimum size to yield the income would make no adjustment in size but those farms currently smaller than the minimum size would be reorganized into farms of the minimum size.

It was estimated from census of agriculture and other data that there were 21,135 farms in the area in 1959. The open land acreage determined for the study was 1,564,125 acres. From available data, the

farms were distributed by size according to open land acreage and the total open land distributed to the various size groups. These data were used to develop the cumulative distribution curve, Figure 2. This curve was used to determine, for each of the program solutions, the number of farms with acreages currently above or below the minimum required to yield the specified income target. Also, the open land acreage associated with the number of farms can be determined. The calculations to determine the adjustments in farm numbers for each programmed situation are presented in Appendix C. For discussion here only the percentage change is shown.

There were 78.7 per cent of the farms in the area with fewer acres than the least requirement to obtain the specified income (84.6 acres). However, these farms controlled only 35.2 per cent of the open land. At the highest minimum requirement for a solution (174.6 acres), 92.8 per cent of the farms had fewer acres than the minimum but controlled only 57.1 per cent of the open land.

With the assumption that all open land was adjusted into farms of exactly the minimum size to yield the income target, the percentage decrease which would occur in farm numbers ranged from 12.6 per cent with a farm size of 84.6 acres to 57.6 per cent with a farm of 174.6 acres, Table 7. With the assumption that adjustment would be made only with the open land in farms presently smaller than the minimum acreage required to yield the income target, the percentage decrease required in farm numbers ranged from 47.9 per cent to 68.6 per cent, Table 8. For all the situations considered, the percentage decrease was 50 per cent or more except for the situation of no land charge and the situation with 36.4 cent cotton and 100 per cent allotment level.

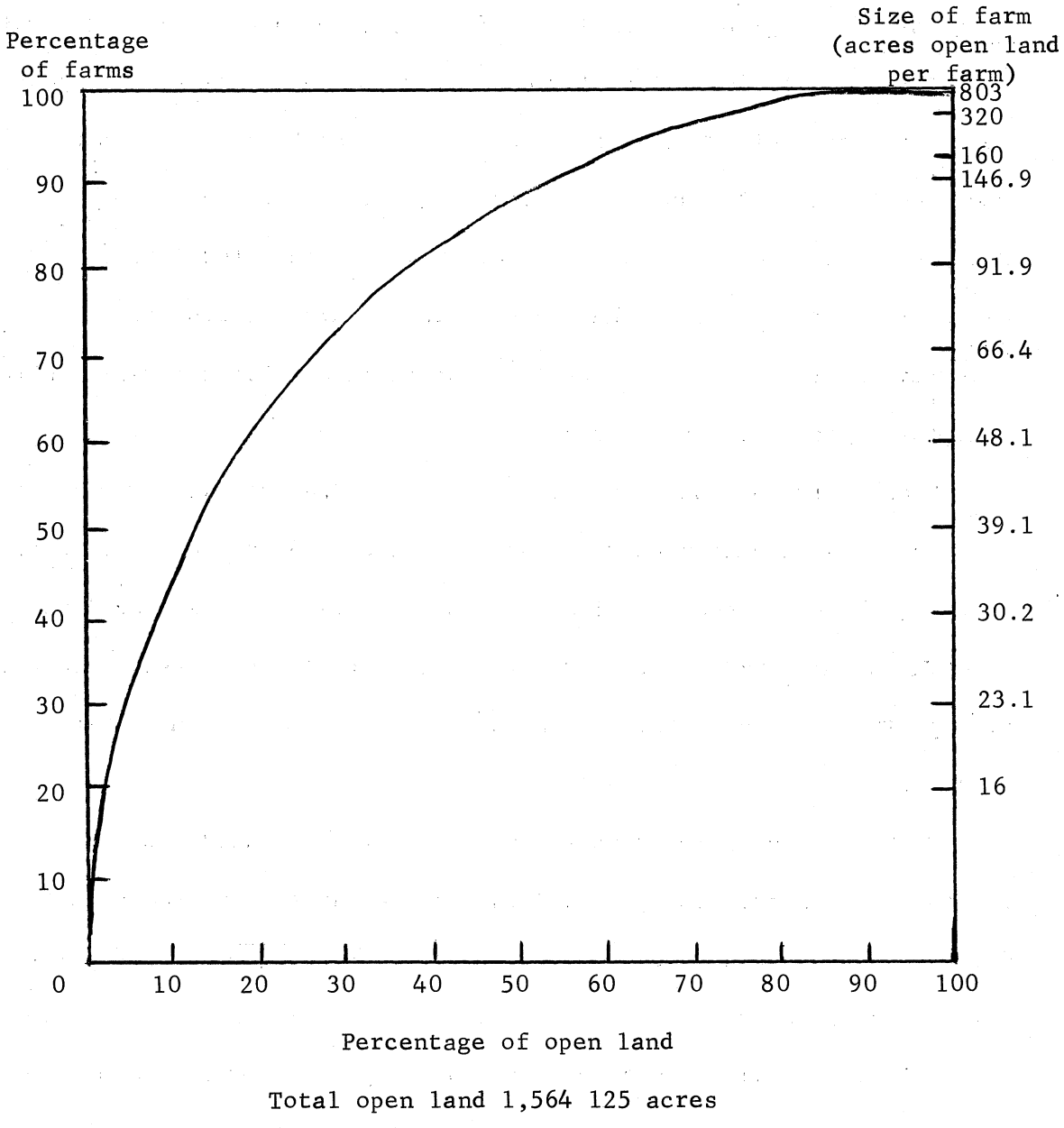

Fig. 2. Cumulative Distribution of Number of Farms and Associated Open Land Per Farm in Each Farm Size Category, Limestone Valley Areas of Alabama, 1959

Table 7. Percentage Decrease from Present Number of Farms - Assuming All Open Land is Adjusted into Farms Exactly the Minimum Size Required to Yield the Specified Income, Limestone Valley Areas, Alabama

A. Cotton allotment at 1963 level, 31.2¢ per pound cotton, labor at base price

Enterprises considered	Land price per acre				
	$0	$100	$200	$300	$400
	(per cent)				
$5,000 income target					
All enterprises considered	12.6	18.6	24.6	30.6	36.7
Labor 150 per cent of base			25.3		
Labor 200 per cent of base			26.1		
Hogs and steers excluded	--	39.4	45.5	51.6	57.6
$7,000 income target					
All enterprises considered			43.2		52.3

B. Land and labor current, all enterprises considered

Cotton allotment (Per cent of 1963 Level)	Cotton price (cents per pound of lint)			
	20.8	26.0	31.2	36.4
	(per cent)			
$5,000 income target				
55	--	--	27.0	22.9
85	--	30.0	25.4	19.0
100	30.0	30.0	24.6	17.0
115	30.0	30.0	23.7	--
$7,000 income target				
85			43.8	
100		48.4	43.2	

Table 8. Percentage Decrease from Present Number of Farms Assuming Adjustment Only of the Open Land in Farms Currently Smaller Than The Minimum Size to Yield the Income Target, Limestone Valley Areas, Alabama

A. Cotton allotment at 1963 level, 31.2¢ per pound cotton, labor at base price

Enterprises considered	Land price per acre				
	$0	$100	$200	$300	$400
	(per cent)				
$5,000 income target					
All enterprises considered	47.9	50.2	52.1	54.5	57.3
Labor 150 per cent of base			52.3		
Labor 200 per cent of base			52.5		
Hogs and steers excluded	--	58.4	61.3	65.0	68.6
$7,000 income target					
All activities considered			60.3		65.5

B. Land and labor current, all enterprises considered

Cotton allotment (Per cent of 1963 Level)	Cotton price (cents per pound of lint)			
	20.8	26.0	31.2	36.4
	(per cent)			
$5,000 income target				
55	--	--	52.9	51.4
85	--	54.2	52.4	50.0
100	54.2	54.2	52.1	49.6
115	54.2	54.2	51.7	--
$7,000 income target				
85			60.7	
100		63.5	60.3	

Implications

Assuming conditions approximating the current situation, cotton is the most profitable enterprise for farmers in the Limestone Valley areas of Alabama. However, if a farmer is willing and able to learn and use good management practices in corn and sow-pig production, these enterprises compete very favorably with cotton. With 65 bushels per acre corn and $16 per hundredweight hogs, the corn-hog enterprises would be most profitable when cotton price is as low as 26 cents per pound of lint. It should be pointed out, however, that to produce corn and hogs at this level would required much improvement in management practices over the current practices; whereas, current cotton production uses management practices more comparable to those assumed in the study.

Farmers who have cow-calf enterprises using land suitable for plowing are doing so at a sacrifice to potential income. When hogs and steers were eliminated as enterprise possibilities, alfalfa hay, using a 4 and 1 fallow rotation, was planted on all the available row cropland that had been used for corn and hogs in the previous programs. The cow-calf enterprise was still restricted to the nonplowable land suitable only for pasture. One precaution with this solution is the problem of alfalfa weevil causing alfalfa production to be more risky than usual. However, these results do indicate that only on farms with a large acreage of nonplowable land would income not be sacrificed if a large cow-calf enterprise were utilized.

Although labor in the area is becoming scarce due to increased off-farm opportunities, the results indicate this should not create a serious problem in the near future. None of the various enterprise organizations

fully utilized the labor available from a full-time operator. However there were some periods of peak load where some seasonal labor was needed. This labor could continue to be supplied by unpaid family labor or by school age children on vacation.

The major implication of the results is the seemingly poor income position of most of the farmers in the area due to lack of size of operation. When at least 79 per cent of the farms in the area are too small to yield a $5,000-operator labor and management return, the adjustment implications are serious. In fact, in the farm organization at which only 79 per cent of the farms were too small to yield the income the return was actually to operator labor and management and land since no return to land was charged. Assuming a return to land of 5 per cent of its estimated current value is required above the operator labor and management return, 81 per cent of the farms are too small to yield the desired return.

It is possible that some of the small farms can go to highly specialized and high capital using enterprises, such as poultry, to increase returns on the small acreages. However, the available markets, management ability of operators, and capital for expansion are limiting factors to many such adjustments. The majority of the farmers in the area will continue to produce mostly row crops with limited livestock so that returns will generally be low.

The Tennessee River Valley area is having a rapid industrial growth. Employment opportunities are increasing so that the opportunity exists for a number of people to shift from farm to nonfarm employment. The results indicate a needed reduction in number of farms of about one-half

of the present number to give the remaining farmers an opportunity of a $5,000 labor and management return. Such magnitude of adjustments can and may occur faster in this area than it would in areas with less rapid industrial development.

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APPENDIX A

Appendix A, Table 1. Assumed Base Prices Received by Farmers, Used For Minimum Resource Programming Model, Limestone Valley Areas, Alabama

Item	Unit	Price
		Dollars
Crops		
Lint cotton	Lb.	0.312
Cotton seed	Ton	50.00
Corn (grain)	Bu.	1.05
Grain sorghum	Bu.	.95
Soybeans	Bu.	2.20
Oats	Bu.	0.80
Wheat	Bu.	1.80
Alfalfa hay	Ton	34.00
Lespedeza hay	Ton	28.00
Livestock		
Hogs	Cwt.	16.00
Sows	Cwt.	13.00
Boar	Cwt.	6.00
Calves	Cwt.	22.00
Cull cows	Cwt.	15.50
Bull	Cwt.	17.00
Steers	Cwt.	24.00

Appendix A, Table 2. Assumed Base Prices Paid by Farmers, Used For Minimum Resource Programming Model, Limestone Valley Areas, Alabama

Item	Unit	Price
		Dollars
Seed		
Cotton, acid delinted	Lb.	0.18
Corn	Lb.	0.18
Grain sorghum	Lb.	0.16
Oats	Lb.	1.50
Wheat	Bu.	3.15
Soybeans	Bu.	4.00
Lespedeza, Kobe	Lb.	0.22
Orchard grass	Lb.	0.32
White clover	Lb.	0.70
Hairy vetch	Lb.	0.18
Crimson clover, common	Lb.	0.30
Millet	Lb.	0.15
Coastal bermuda sprigs	Bu.	0.50
Fertilizer		
4-12-12	Ton	41.00
0-20-20	Ton	47.00
0-16-8	Ton	32.00
0-10-20 with 50 lb. borax per ton	Ton	39.00
33.5-0-0	Ton	72.00
Pesticides		
Insecticide, cotton	Lb.	0.10
Insecticide, grain sorghum	Lb.	0.08
Pre-emergence chemical	Gal.	20.00
Herbicidal oil	Gal.	0.35
Phenothiazine	Lb.	0.70
2,4-D	Lb.	0.85
Feed and minerals		
Cottonseed meal	Cwt.	4.00
Meat and bone scraps (50 per cent)	Cwt.	3.60
Soybean oil meal (44 per cent)	Cwt.	2.90
Alfalfa leaf meal	Cwt.	4.10
Salt, loose	Cwt.	1.45
Salt, swine formula	Cwt.	1.65
Salt, block	Cwt.	2.00

(Continued)

Appendix A, Table 2. Continued

Item	Unit	Price
		Dollars
Livestock		
Feeder calves	Cwt.	24.00
Boar	Head	100.00
Bull	Head	600.00
Custom work		
Picking cotton, machine	Lb. of lint	0.06
Combining, oats	Acre	6.00
Combining, soybeans	Acre	7.00
Combining, grain sorghum	Acre	6.00
Mowing, raking, baling	Ton	9.00
Ginning	Bale	14.00
Shelling corn	Bu.	0.10
Grinding and mixing concentrate	Cwt.	0.25
Mixing supplement	Cwt.	0.10
Hauling livestock	Cwt.	0.25
Liming (includes lime)	Ton	9.40
Miscellaneous		
Seasonal labor	Hr.	0.60
Capital	Dol.	0.06
Defoliant	Lb.	0.07
Stilbestrol (in feed)	Head	0.75

Appendix A, Table 3. Machinery Component With New and Annual Cost Used for Minimum Resource Programming Model - Limestone Valley Areas, Alabama

Item	Size	New cost[a]
		Dollars
Tractor	3-plow	4,000
Tractor (used)		200
Rotary mower	7-ft.	430
Plow	3-bottom	375
Disk harrow	7-ft.	275
Spike-tooth harrow	3-section	200
Planter	4-row	720
Pre-emerge equipment	4-row	150
Cultivator	4-row	675
Post-emerge equipment	4-row	100
Fertilizer attachment	4-row	165
Low-volume sprayer	8-row	300
Cornpicker	1-row pull type	1,200
Wagons (2)		800
Grain drill	8-ft.	560
Fertilizer spreader	8-ft.	340
Mower	7-ft.	350
Rake	7-ft.	500
Baler		1,750
Grain elevator		375
Cyclone hand seeder		15
Total investment		13,480
Average investment		6,740
Annual depreciation		1,186.20
Annual interest		404.40
Annual housing, taxes, and insurance		202.20

[a]Based on a 1962 survey of machinery and equipment dealers in the area.

Appendix A, Table 4. General Overhead Cost Assumed as Fixed Expenses, Limestone Valley Areas, Alabama

Item	Value
Annual interest on machinery	$ 404.40
Annual cost of housing, taxes, and insurance on machinery	202.20
Pickup truck operation (farm share including insurance)	375.00
Bookkeeping and tax service	50.00
General farm liability insurance	40.00
Telephone (farm share)	40.00
Total	$1,111.60

Personal property taxes for land and buildings were charged at the rate of $1 per acre.

APPENDIX B

FARM BUSINESS SUMMARIES FOR THE PROGRAMMED SITUATIONS

Linear programming techniques were used to determine the minimum acreage of open land that would be required to yield the specified net return to a farm operator's labor and management under a specified set of assumptions. As a byproduct of the results, it was possible to determine the optimum combination of enterprises on this acreage, the amount of labor and capital required for this organization, and the receipts and expenses of the production.

All of the above data are summarized in the following tables. Each of the solutions results in a $5,000-return to operator's labor and management except for those in Table 8 which result in a $7,000-return. Each solution differs from any other solution because of change in one or more specific assumptions. Each table title specifies the fixed assumptions for that group of solutions.

Appendix B, Table 1. Assumptions: Cotton Price, 31.2 Cents Per Pound of Lint; Cotton Allotment, 100 Per Cent of Current; Labor Price, Current; Land Price at Specified Values

Item	Unit	Land price per acre				
		$0	$100	$200	$300	$400
Total open land	Acre	84.7	90.9	89.2	106.7	116.9
Cotton	Acre	15.2	16.4	17.7	19.2	21.0
Corn	Acre	39.6	42.5	46.0	50.0	54.8
Oats	Acre	14.0	15.0	16.2	17.6	19.3
Pasture	Acre	15.9	17.0	18.3	19.9	21.8
Cows	No.	3.6	3.9	4.2	4.5	5.0
Sows	No.	15.1	16.2	17.5	19.1	20.9
Operator labor	Hour	1,258	1,352	1,461	1,588	1,740
Seasonal labor	Hour	170	182	197	214	234
Investment capital						
Land	Dol.	0	9,090	19,640	32,010	46,760
Machinery	Dol.	6,740	6,740	6,740	6,740	6,740
Other	Dol.	4,376	4,702	5,080	5,523	6,051
Operating capital	Dol.	2,170	2,331	2,519	2,738	3,000
Total capital	Dol.	13,286	22,863	33,979	47,011	62,551
Gross sales	Dol.	13,097	14,074	15,217	16,549	18,117
Operating and overhead expense	Dol.	8,097	8,619	9,233	9,948	10,780
Return to land	Dol.	0	455	982	1,600	2,338
Return to operator labor and management	Dol.	5,000	5,000	5,002	5,001	4,999

Appendix B, Table 2. Assumptions: Cotton Price, 31.2 Cents Per Pound of Lint; Cotton Allotment, 100 Per Cent of Current; Labor Price, Current; Hogs and Steers Excluded; Land Price at Specified Values

Item	Unit	Land price per acre			
		$100	$200	$300	$400
Total open land	Acre	122.2	135.8	152.8	174.6
Alfalfa	Acre	50.2	55.7	62.7	71.6
Cotton	Acre	22.0	24.4	27.5	31.4
Oats	Acre	25.7	28.5	32.1	36.7
Pasture	Acre	11.7	13.3	14.8	17.0
Fallow open land	Acre	12.6	13.9	15.7	17.9
Cows	No.	5.2	5.8	6.5	7.4
Operator labor	Hour	671	746	839	959
Seasonal labor	Hour	573	636	716	818
Investment capital					
Land	Dol.	12,220	27,160	45,840	69,840
Machinery	Dol.	6,740	6,740	6,740	6,740
Other	Dol.	2,615	2,906	3,269	3,736
Operating capital	Dol.	1,416	1,573	1,770	2,022
Total capital	Dol.	22,991	38,379	57,619	82,388
Gross sales	Dol.	13,356	14,820	16,688	19,056
Operating and overhead expense	Dol.	7,741	8,469	9,396	10,572
Return to land	Dol.	611	1,358	2,292	3,492
Return to operator labor and management	Dol.	5,004	4,993	5,000	4,992

Appendix B, Table 3. Assumptions: Cotton Price, 31.2 Cents Per Pound of Lint; Cotton Allotment, 100 Per Cent of Current; Land Price Current; Labor Price at Specified Values

Item	Unit	Labor price per hour		
		Current	Plus 50 per cent	Plus 100 per cent
Total open land	Acre	98.2	99.1	100.1
Cotton	Acre	17.7	17.8	18.0
Corn	Acre	46.0	46.4	46.9
Oats	Acre	16.2	16.4	16.5
Pasture	Acre	18.3	18.5	18.7
Cows	No.	4.2	4.2	4.2
Sows	No.	17.5	17.7	17.9
Operator labor	Hour	1,461	1,475	1,489
Seasonal labor	Hour	197	199	201
Investment capital				
Land	Dol.	19,640	19,820	20,020
Machinery	Dol.	6,740	6,740	6,740
Other	Dol.	5,080	5,129	5,180
Operating capital	Dol.	2,519	2,543	2,568
Total capital	Dol.	33,979	34,232	34,508
Gross sales	Dol.	15,217	15,346	15,509
Operating and overhead expense	Dol.	9,233	9,355	9,509
Return to land	Dol.	982	991	1,001
Return to operator land and management	Dol.	5,002	5,000	4,999

Appendix B, Table 4. Assumptions: Cotton Allotment, 55 Per Cent of Current; Land and Labor Prices, Current; Cotton Prices at Specified Levels

Item	Unit	Cotton price per pound of lint	
		31.2 cents	36.4 cents
Total open land	Acre	101.4	96.0
Cotton	Acre	10.0	9.5
Corn	Acre	55.0	52.0
Oats	Acre	16.0	15.2
Pasture	Acre	20.4	19.3
Cows	No.	4.3	4.1
Sows	No.	21.0	19.9
Operator labor	Hour	1,623	1,536
Seasonal labor	Hour	196	185
Investment capital			
Land	Dol.	20,280	19,200
Machinery	Dol.	6,740	6,740
Other	Dol.	5,884	5,567
Operating capital	Dol.	2,715	2,569
Total capital	Dol.	35,619	34,076
Gross sales	Dol.	15,317	14,830
Operating and overhead expense	Dol.	9,304	8,869
Return to land	Dol.	1,014	960
Return to operator labor and management	Dol.	4,999	5,001

Appendix B, Table 5. Assumptions: Cotton Allotment, 85 Per Cent of Current; Land and Labor Prices, Current; Cotton Prices at Specified Levels

Item	Unit	Cotton price per pound of lint		
		26.0 cents	31.2 cents	36.4 cents
Total open land	Acre	105.7	99.2	91.4
Cotton	Acre	0.0	15.2	14.0
Corn	Acre	66.9	48.9	45.0
Oats	Acre	15.8	16.2	14.9
Pasture	Acre	23.0	19.0	17.5
Cows	No.	4.5	4.2	3.9
Sows	No.	25.5	18.7	17.2
Operator labor	Hour	1,838	1,514	1,394
Seasonal labor	Hour	195	197	181
Investment capital				
Land	Dol.	21,140	19,840	18,280
Machinery	Dol.	6,740	6,740	6,740
Other	Dol.	6,942	5,342	4,919
Operating capital	Dol.	2,974	2,583	2,378
Total capital	Dol.	37,796	34,505	32,317
Gross sales	Dol.	15,462	15,245	14,529
Operating and overhead expense	Dol.	9,404	9,253	8,614
Return to land	Dol.	1,057	990	914
Return to operator labor and management	Dol.	5,001	5,000	5,001

Appendix B, Table 6. Assumptions: Cotton Allotment, 100 Per Cent of Current; Land and Labor Prices, Current; Cotton Prices at Specified Levels

Item	Unit	Cotton price per pound of lint			
		20.8 cents	26.0 cents	31.2 cents	36.4 cents
Total open land	Acre	105.7	105.7	98.2	89.2
Cotton	Acre	0.0	0.0	17.7	16.1
Corn	Acre	66.9	66.9	46.0	41.8
Oats	Acre	15.8	15.8	16.2	14.8
Pasture	Acre	23.0	23.0	18.3	16.5
Cows	No.	4.5	4.5	4.2	3.8
Sows	No.	25.5	25.5	17.5	16.0
Operator labor	Hour	1,831	1,831	1,461	1,328
Seasonal labor	Hour	195	195	197	179
Investment capital					
Land	Dol.	21,140	21,140	19,640	17,840
Machinery	Dol.	6,740	6,740	6,740	6,740
Other	Dol.	6,942	6,942	5,080	4,618
Operating capital	Dol.	2,974	2,974	2,519	2,290
Total capital	Dol.	37,796	37,796	33,979	31,488
Gross sales	Dol.	15,462	15,462	15,217	14,389
Operating and overhead expense	Dol.	9,404	9,404	9,233	8,495
Return to land	Dol.	1,057	1,057	982	892
Return to operator labor and management	Dol.	5,001	5,001	5,002	5,002

Appendix B, Table 7. Assumptions: Cotton Allotment 115 Per Cent of Current; Land and Labor Prices, Current; Cotton Prices at Specified Levels

Item	Unit	Cotton price per pound of lint		
		20.8 cents	26.0 cents	31.2 cents
Total open land	Acre	105.7	105.7	97.1
Cotton	Acre	0.0	0.0	20.1
Corn	Acre	66.9	66.9	43.1
Oats	Acre	15.8	15.8	16.3
Pasture	Acre	23.0	23.0	17.6
Cows	No.	4.5	4.5	4.1
Sows	No.	25.5	25.5	16.4
Operator labor	Hour	1,831	1,831	1,409
Seasonal labor	Hour	195	195	197
Investment capital				
Land	Dol.	21,140	21,140	19,420
Machinery	Dol.	6,740	6,740	6,740
Other	Dol.	6,942	6,942	4,823
Operating capital	Dol.	2,974	2,974	2,456
Total capital	Dol.	37,796	37,796	33,439
Gross sales	Dol.	15,462	15,462	15,176
Operating and overhead expense	Dol.	9,404	9,404	9,205
Return to land	Dol.	1,057	1,057	971
Return to operator labor and management	Dol.	5,001	5,001	5,000

Appendix B, Table 8. Farm Business Summary for Organizations That Yield $7,000 Operator Labor and Management Returns, Specified Cotton Allotment Levels, Cotton Prices and Values of Open Land, Limestone Valley Areas, Alabama

Item	Unit	100 per cent allotment, 26.0¢ cotton price, $200 land	85 per cent allotment, 31.2¢ cotton price, $200 land	100 per cent allotment, 31.2¢ cotton price, $400 land	100 per cent allotment, 31.2¢ cotton price, $200 land
Total open land	Acre	143.3	131.7	155.2	130.3
Cotton	Acre	10.0	20.2	27.9	23.4
Corn	Acre	81.5	64.9	72.7	61.0
Oats	Acre	22.3	21.5	25.7	21.5
Pasture	Acre	29.5	25.1	28.9	24.4
Cows	No.	6.1	5.6	6.6	5.5
Sows	No.	31.1	24.8	27.7	23.3
Operator labor	Hour	2,282	2,019	2,310	1,937
Seasonal labor	Hour	273	261	311	261
Investment capital					
Land	Dol.	28,660	26,340	62,080	26,060
Machinery	Dol.	6,740	6,740	6,740	6,740
Other capital	Dol.	8,630	7,090	8,032	6,742
Operating capital	Dol.	3,892	3,428	3,983	3,343
Total capital	Dol.	47,922	43,598	80,835	42,885
Gross sales	Dol.	21,093	20,269	24,031	20,185
Oper. and overhead expense	Dol.	12,660	11,952	13,927	11,882
Return to land	Dol.	1,433	1,317	3,104	1,303
Return to oper., labor and management	Dol.	7,000	7,000	7,000	7,000

Appendix C, Table 1. Optimum Number of Farms, Minimum and Percentage Changes Consistent With A $5,000-Return, Adjusted For Farm Units Above the Minimum Land Requirement Level, Specified Land Prices and Enterprise Exclusions, Limestone Valley Areas, Alabama

Number of farms - 21,135
Open land acres - 1,564,125

Land price and enterprise assumptions	Minimum open land requirement per farm	Maximum number of farms possible[a] and percentage change	Presently above minimum requirement	Resources to be adjusted	Maximum possible on adjustable resources	Resources after adjustment[b]	Minimum change in farm numbers
All activities considered							
Land $0 per acre							
Number of farms		18,467	4,504	16,631	6,500	11,004	-10,131
Open land acres	84.7		1,013,553	550,572			
Per cent		12.6					-47.9
Land $100 per acre							
Number of farms		17,207	4,265	16,870	6,263	10,528	-10,607
Open land acres	90.9		994,783	569,342			
Per cent		18.6					-50.2
Land $200 per acre							
Number of farms		15,928	3,984	17,151	6,123	10,116	-11,019
Open land acres	98.2		961,937	602,188			
Per cent		24.6					-52.1
Land $300 per acre							
Number of farms		14,659	3,658	17,477	5,952	9,610	-11,525
Open land acres	106.7		929,090	635,035			
Per cent		30.6					-54.5
Land $400 per acre							
Number of farms		13,380	3,265	17,870	5,753	9,018	-12,117
Open land acres	116.9		891,651	672,574			
Per cent		36.7					-57.3

[a]Assuming the total open land available is adjusted into farms of exactly the minimum size.

[b]Assuming only the open land in farms below the minimum size is adjusted.

Appendix C, Table 2. Optimum Number of Farms, Minimum and Percentage Changes Consistent With A $5,000-Return, Adjusted for Farm Units Above the Minimum Land Requirement Level, Specified Land Prices and Enterprise Exclusions, Limestone Valley Areas, Alabama

Number of farms - 21,135
Open land acres - 1,564,125

Land price and enterprise assumptions	Minimum open land requirement per farm	Maximum number of farms possible[a] and percentage change	Presently above minimum requirement	Resources to be adjusted	Maximum possible on adjustable resources	Resources after adjustment[b]	Minimum change in farm numbers
Hogs and steers excluded							
Land $100 per acre							
Number of farms		12,800	3,062	18,073	5,734	8,796	-12.339
Open land acres	122.2		863,397	700,728			
Per cent		39.4					-58.4
Land $200 per acre							
Number of farms		11,518	2,540	18,595	5,632	8,172	-12,963
Open land acres	135.8		799,268	764,857			
Per cent		45.5					-61.3
Land $300 per acre							
Number of farms		10,236	1,887	19,248	5,507	7,394	-13,741
Open land acres	152.8		722,626	841,499			
Per cent		51.6					-65.0
Land $400 per acre							
Number of farms		8,958	1,515	19,620	5,115	6,630	-14,505
Open land acres	174.6		671,010	893,115			
Per cent		57.6					-68.6

[a]Assuming the total open land available is adjusted into farms of exactly the minimum size.

[b]Assuming only the open land in farms below the minimum size is adjusted.

Appendix C, Table 3. Optimum Number of Farms, Minimum and Percentage Changes Consistent With A $5,000-Return, Adjusted for Farm Units Above the Minimum Land Requirement Level, Specified Hired Labor Prices, Limestone Valley Areas, Alabama

Number of farms - 21,135
Open land acres - 1,564,125

Labor price and enterprise assumptions	Minimum open land requirement per farm	Maximum number of farms possible[a] and percentage change	Presently above minimum requirement	Resources to be adjusted	Maximum possible on adjustable resources	Resources after adjustment[b]	Minimum change in farm numbers
Base labor price							
Number of farms		15,929	3,984	17,151	6,132	10,116	-11,019
Open land acres	98.2		961,937	602,188			
Per cent		24.6					-52.1
Base labor price plus 50 per cent							
Number of farms		15,783	3,950	17,185	6,124	10,074	-11,061
Open land acres	99.1		957,245	606,880			
Per cent		25.3					-52.3
Base labor price plus 100 per cent							
Number of farms		15,626	3,912	17,223	6,125	10,037	-11,098
Open land acres	100.1		950,988	613,137			
Per cent		26.1					-52.5

[a]Assuming the total open land available is adjusted into farms of exactly the minimum size.

[b]Assuming only the open land in farms below the minimum size is adjusted.

Appendix C, Table 4. Optimum Number of Farms, Minimum and Percentage Changes Consistent With a $5,000-Return, Adjusted for Farm Units Above the Minimum Land Requirements Level, Specified Cotton Prices and Allotment Levels, Limestone Valley Areas of Alabama

Number of farms - 21,135
Open land acres - 1,564,125

Cotton price allotment assumptions	Minimum open land requirement per farm	Maximum number of farms possible[a] and percentage change	Presently above minimum requirement	Resources to be adjusted	Maximum possible on adjustable resources	Resources after adjustment[b]	Minimum change in farm numbers
20.8 cents, 100 per cent allotment							
Number of farms		14,798	3,697	17,438	5,993	9,690	-11,445
Open land acres	105.7		930,654	633,471			
Per cent		30.0					-54.2
26.0 cents, 85 per cent allotment							
Number of farms		14,798	8,697	17,438	5,993	9,690	-11,445
Open land acres	105.7		930,654	633,471			
Per cent		30.0					-54.2
26.0 cents, 100 per cent allotment							
Number of farms		14,798	3,697	17,438	5,993	9,690	-11,445
Open land acres	105.7		930,654	633,471			
Per cent		30.0					-54.2
26.0 cents, 115 per cent allotment							
Number of farms		14,798	3,697	17,438	5,993	9,690	-11,445
Open land acres	105.7		930,654	633,471			
Per cent		30.0					-54.2
31.2 cents, 55 per cent allotment							
Number of farms		15,425	3,863	17,272	6,093	9,956	-11,179
Open land acres	101.4		946,296	617,829			
Per cent		27.0					-52.9
31.2 cents, 85 per cent allotment							
Number of farms		15,777	3,948	17,187	6,118	10,066	-11,069
Open land acres	99.2		957,244	606,881			
Per cent		25.4					-52.4

(Continued)

Appendix C, Table 4. Continued

Cotton price allotment assumptions	Minimum open land requirement per farm	Maximum number of farms possible[a] and percentage change	Presently above minimum requirement	Resources to be adjusted	Maximum possible on adjustable resources	Resources after adjustment[b]	Minimum change in farm numbers
31.2 cents, 100 per cent allotment							
Number of farms		15,929	3,984	17,151	6,132	10,116	-11,019
Open land acres	98.2		961,937	602,188			
Per cent		24.6					-52.1
31.2 cents, 115 per cent allotment							
Number of farms		16,118	4,026	17,109	6,178	10,204	-10,931
Open land acres	97.1		1,504,141	599,840			
Per cent		23.7					-51.7
36.4 cents, 55 per cent allotment							
Number of farms		16,294	4,068	17,067	6,208	10,276	-10,859
Open land acres	96.0		968,193	595,932			
Per cent		22.9					-51.4
36.4 cents, 85 per cent allotment							
Number of farms		17,114	4,246	16,889	6,323	10,569	-10,566
Open land acres	91.4		1,506,331	577,940			
Per cent		19.0					-50.0
36.4 cents, 100 per cent allotment							
Number of farms		17,535	4,331	16,804	6,330	10,661	-10,474
Open land acres	89.2		99,476	564,649			
Per cent		17.0					-49.6

[a]Assuming the total open land available is adjusted into farms of exactly the minimum size.

[b]Assuming only the open land in farms below the minimum size is adjusted.

Appendix C, Table 5. Optimum Number of Farms, Minimum and Percentage Changes Consistent with a $7,000-Return, Adjusted for Farm Units Above the Minimum Land Requirements Level, With Specified Program Assumptions, Limestone Valley Areas, Alabama

Number of farms - 21,135
Open land acres - 1,564,125

Program assumptions	Minimum open land requirement per farm	Maximum number of farms possible[a] and percentage change	Presently above minimum requirement	Resources to be adjusted	Maximum possible on adjustable resources	Resources after adjustment[b]	Minimum change in farm numbers
100 per cent cotton allotment							
31.2 cent cotton price							
$200 per acre land							
Number of farms		12,004	2,752	18,383	5,630	8,382	-12,753
Open land acres	130.3		830,550	733,575			
Per cent		43.2					-60.3
85 per cent cotton allotment							
31.2 cent cotton price							
$200 per acre land							
Number of farms		11,876	2,697	18,438	5,606	8,303	-12,832
Open land acres	131.7		825,858	738,267			
Per cent		43.8					-60.7
100 per cent cotton allotment							
26.0 cent cotton price							
$200 per acre land							
Number of farms		10,915	2,253	18,882	5,458	7,711	-13,424
Open land acres	143.3		782,063	782,062			
Per cent		48.4					-63.5
100 per cent cotton allotment							
31.2 cent cotton price							
$400 per acre land							
Number of farms		10,078	1,794	19,341	5,503	7,297	-13,838
Open land acres	155.2		710,113	854,012			
Per cent		52.3					-65.5

[a]Assuming the total open land available is adjusted into farms of exactly the minimum size.

[b]Assuming only the open land in farms below the minimum size is adjusted.