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# Optimum Farm Organization

## and

# Aggregate Area Production

## Limestone Valley Areas, Alabama



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In cooperation with

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The overall purposes of this 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

Several representative farm sizes in the Limestone Valley Areas of Alabama were studied under assumed conditions of estimated free market prices, no production controls, and improved production technology. Budgets were prepared for each size of farm and linear programming procedures were used to select the optimum combination of enterprises. Three sets of programs were computed. The first set included poultry and corn buying as alternatives; the second excluded poultry; and the third excluded both poultry and corn buying. Results indicate the strong competitive position of cotton in the Limestone Valley Areas. Under the same assumed conditions, more cotton would be produced in these areas than is now produced in all of Alabama. Corn, hogs, and poultry are cotton's strongest competitors for resources. As more labor is added to fixed amounts of land, more poultry enters the optimum programs. If poultry is excluded as an alternative, then the unused labor allows the hog enterprise to expand if corn purchasing is permitted. Other commodities produced in smaller amounts are oats for grain, alfalfa hay, lespedeza hay, grain sorghum, and a few beef calves.

For the third alternative which included only land-based enterprises, the effects of changing product prices were investigated. Cotton prices were varied plus and minus 20 and 40 per cent from the 26-cent base price. Prices of other products were varied plus and minus 30 per cent from the base prices. Weights were developed for each representative farm size reflecting the number of farms on limestone and similar soils in each size class. These were used to estimate area production response under each of the 15 price situations.

The results of this analysis further substantiated the strong competitive position of cotton in the Limestone Valleys. With other commodities at base prices, considerable cotton is produced on the two larger farm sizes at a price of 20.8 cents, but little is produced on the smaller farms. At a cotton price of 26 cents, cotton is produced on all sizes of farms and the total acreage is more than doubled. At 31.2 cents, there is a further 25 per cent increase in cotton acreage, and essentially all suitable land in the Limestone Valley Areas is devoted to cotton production. When the prices of competing commodities are reduced 30 per cent, the acreage of cotton is about the same at 15.6 cents as it is with 20.8-cent cotton and other commodities at base prices. Under these lower price levels for competing commodities, essentially all suitable land is devoted to cotton at a price of 20.8 cents or above. With competing commodity prices at 30 per cent above base, cotton is first produced at 26 cents; and, even at a price of 36.4 cents, not quite all suitable land is devoted to cotton.

As acreage of cotton increases because of higher prices, there is always a decrease in corn and hog production. Again oats, alfalfa hay, lespedeza hay, grain sorghum, and beef cattle are included in the enterprise combinations.

# OPTIMUM FARM ORGANIZATION and AGGREGATE AREA PRODUCTION, LIMESTONE VALLEY AREAS, ALABAMA*

P. L. Strickland, Jr. and Earl J. Partenheimer**

## Introduction

The comparative economic advantage of different areas in the production of various farm products changes as farm technology and economic conditions change. Questions repeatedly raised by farmers and agricultural workers indicate a need for economic information to guide them in adjusting to technological and economic changes. Some of these questions concern the relative returns from various enterprises and enterprise combinations for particular farm resource situations. Other questions concern the kinds and quantities of resources needed for various enterprises and enterprise combinations. Answers to these questions should help public agencies and farm organizations concerned with agricultural policy problems and assist State and Federal agencies in administering agricultural programs.

Adjustments that will pay any one farmer to make depend upon actions taken by competing farmers. This interpendence of profitable actions makes it essential to know the nature and extent to which various in-

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dividual adjustments when taken as a whole would affect production, price, and therefore the ultimate profitability of individual adjustments.

The specific objectives of this study are: (a) To determine the most profitable combinations of enterprises for several selected resource situations under a range of product prices, and (b) to determine aggregrate production for the Limestone Valley Areas of Alabama under these price and resource situations.

## Area of Study

The U. S. Census of Agriculture classifies a nine-county area in northern Alabama as the Limestone Valley Area. However, soil scientists classify only part of the soils in these counties as limestone soils or soils with similar characteristics and yield response. Furthermore, soil scientists classify soils in several other northern Alabama counties as limestone or closely related soils. The areas to which this study applies are the very irregular areas and strips of Limestone Valleys and flood plains throughout northern Alabama (Figure 1). Soils in these areas are predominately heavy and topography is largely level to gently rolling. The soils have greater inherent productivity than most other soils in the State.

From a sample of Agricultural Stabilization and Conservation Service, U. S. Department of Agriculture records, it was estimated that there were nearly 25,000 farms within the delineated areas (Table 1). These farms were classified into groups according to the amount of open land (cropland and open pasture land) on each farm. Since census figures are for counties, no estimates were made of the number of farms according to census classes by income.

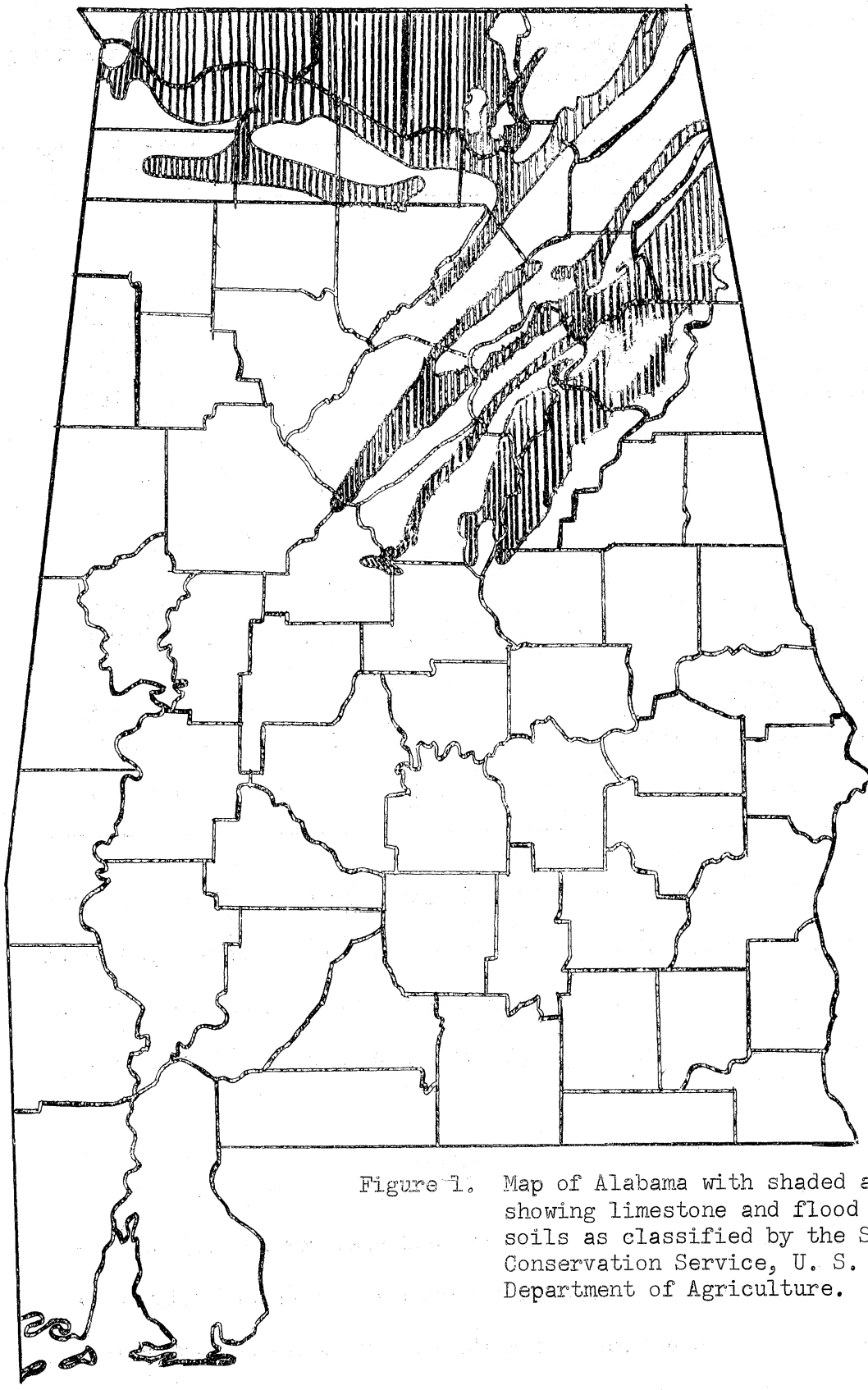

Figure 1. Map of Alabama with shaded areas showing limestone and flood plain soils as classified by the Soil Conservation Service, U. S. Department of Agriculture.

Table 1. Estimated Number of Farms, by Size Groups, Acreage and Production of Specified Crops and Hog Number on Farms, Limestone Valley Areas, Alabama, 1960

| Item | Number |
|---|---|
| Size of farms: | |
| 0 to 9.9 acres of open land | 3,584 |
| 10 to 49.9 acres of open land | 12,586 |
| 50 to 124.9 acres of open land | 6,245 |
| 125 to 299.9 acres of open land | 1,751 |
| 300 and over acres of open land | 747 |
| Total | 24,913 |
| Crops: | |
| Cotton: | |
| Acres harvested | 261,800 |
| Bales harvested | 247,190 |
| Corn for grain: | |
| Acres harvested | 302,000 |
| Bushels harvested | 8,261,000 |
| Hogs on farms, January 1, 1960 | 179,100 |

Estimated cotton production on these farms in 1959 was 261,800 harvested acres yielding 247,190 bales, an average of 472 pounds of lint per acre. There were 302,000 acres of corn harvested for grain yielding 8,261,000 bushels. This was an average of 27 bushels per acre.

## Procedure

The wide diversity of farm size and resource holdings of the farms in the Limestone Valley Areas creates the opportunity for a variety of farm adjustment alternatives. It would be impractical to investigate each of these situations. However, implications of the

practicality of making specified adjustments can be gained by classifying the production into major groups and investigating a representative situation within each group.

Linear programming techniques were used to determine the optimum combinations of enterprises for each representative situation whith selected alternatives, product prices, and resource situations. These investigations were made for individual farm adjustments without considering the aggregate effect of such adjustments.

Adjustment opportunities that are profitable for an individual may become less profitable when a large number of individuals take the same action. It is desirable to determine the aggregate effect of the adjustment alternatives. The optimum programs for the representative farm situation were expanded by the percentage of the total acreage in each representative group and summed for all groups to determine the total crop production, livestock production, and total resource use for the area with specified assumptions. Aggregations were made assuming that all the included land base would be adjusted to the optimum farm organizations. Further aggregations were made assuming that specified portions of the included land base did not adjust to the optimum organizations.

## General Assumptions

### Enterprises Considered

The enterprises considered for the programming model included cotton, corn, oats for grain, wheat, grain sorghum, soybeans, lespedeza hay, alfalfa hay, beef cows, feeder steers, hogs, layers, broilers, and milk for manufacture. Optimum farm plans that considered all these enterprises were computed. Since poultry does not compete for land, additional

optimum farm plans were computed with poultry enterprises eliminated. To limit adjustment opportunities to strictly land-based activities, a third set of optimum farm plans were computed with both poultry and corn buying activities eliminated.

Several enterprises were not considered because of resource or economic restrictions. Entrance into Grade A dairy production is severely restricted by State milk control laws. Fruit, nut, and vegetable production were eliminated because of the limited market for these products, and the closeness of the areas that seem to have resources that are better adapted to their production. These enterprises could be very profitable for an individual farmer, but for a large number of farmers to enter these activities would decrease their profitability.

## Enterprise Budgets

General input-output budgets have been previously developed and published for the major farming enterprises of the areas for both existing and improved management practices. 1/ The budgets for improved management practices, assuming the use of the best available technology and a high level of managerial ability, were used in this study. These general

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1/ Budgets for these enterprises are available in: Partenheimer, Earl J., and Ellis, Theo H., Costs and Returns from Crop Production in the Limestone Valley Areas of Alabama, Ala. Agri. Expt. Sta. in cooperation with Farm Econ. Res. Div., Agri. Res. Ser., U. S. Dept. Agri., Auburn Alabama, February 1960; Ellis, Theo H., and Partenheimer, Earl J., Costs and Returns from Livestock Production in the Limestone Valley Areas of Alabama, Ala. Agri. Expt. Sta. in cooperation with Farm Econ. Res. Div., Agri. Res. Ser., U. S. Dept. Agri., Auburn, Alabama, December 1960; and Ellis, Theo H., Partenheimer, Earl J., and Goodman, John G., Costs and Returns from Poultry Production in the Limestone Valley Areas of Alabama, Ala. Agri. Expt. Sta. in cooperation with Farm Econ. Res. Div., Agri. Res. Ser., U. S. Dept. Agri., Auburn, Alabama, January 1960.

budgets were modified by using the assumed prices for this study and by using machinery coefficients fitted to the size of farm under consideration.

Row cropland that was classified as having poor drainage was considered as not suitable for cotton production. Eliminating this land restricted cotton production to 85.7 per cent of the row cropland. Class 1 soils with good management should produce continuous cotton without reduction in yield. Class 2 soils should produce the same yields as Class 1 soils if planted in a 1-1 rotation. However, if Class 2 soils are planted in continuous cotton, there would be some reduction in yield. Therefore, 41.8 per cent (all Class 1 and one-half of Class 2) of the row cropland was programmed with cotton yields of 700 pounds of lint per acre. The second half of Class 2 land (29.0 per cent of all row cropland) was programmed at 650 pounds of lint per acre. Yields of 575 pounds of lint per acre were used for Class 3 land, which accounted for 14.9 per cent of the row cropland.

For crops other than cotton, the yields used were 65 bushels per acre for corn; 70 bushels per acre for oats; 45 bushels per acre for grain sorghum; 4.5 tons less 0.9 ton weather loss per acre for alfalfa; 2 tons less 0.2 ton weather loss per acre for lespedeza hay; 32 bushels per acre for wheat; and 22 bushels per acre for soybeans. Poultry production rates were 21 dozen eggs per hen for caged layers; 20 dozen eggs per hen for floor flocks; and a feed conversion ratio of 2.4 pounds of feed per pound of gain for broilers. Livestock production rates were 9,800 pounds of milk per dairy cow, a 90 per cent calf crop for beef cows, and an average of eight pigs per litter raised to market weight. In the case of hogs and beef cows, replacement gilts and heifers were

subtracted from production. Market hogs were sold at a weight of 210 pounds and fat calves were sold at 525 pounds. Steers were purchased at 450 pounds and sold at 1,075 pounds less 3.5 per cent shrinkage. Included in the livestock budgets were 0.5 acre of pasture per sow; 0.978 acre of pasture, hay, and corn silage per steer; 2.28 acres of pasture and hay per cow in beef cow budgets; and 2.065 acres of pasture, hay, and corn silage per cow equivalent in dairy budgets. No land was double cropped.

Hogs were the only livestock enterprise considered on the small farms. Even if all resources on a farm of this size were devoted to the production of any of the other livestock enterprises, an efficient size operation could not be attained. Using similar reasoning, no beef cow enterprise was allowed on the medium-size farm. The large and extra large farms had enough acreage so that all of the above livestock enterprises could be considered.

Since some of the open land acreage was specified to be suitable only for pasture for beef enterprises, this acreage became idle open land when no such enterprises entered the optimum program. Similarly, other acreages were specified as usable only for close growing crops. When such crops were not in the optimum program, this average also became idle open land. However, in no instance did the optimum program fail to utilize all the available row cropland so that none of this land was ever idle.

## Prices

The input and base product prices used in the analysis were estimated to represent assumed prices in a "free" market economy under conditions

of full employment. 2/ Specifically, they were the market prices which would be expected to exist in 1975 if all marketing controls and price supports were removed from agricultural production within the next few years. Except for labor, the input prices were at or near 1959 levels (Table 2). Base product prices vary considerably from 1959 levels (Table 3).

With poultry and/or corn buying activities considered, optimum programs were computed only at base prices. With poultry and corn buying activities not considered, optimum programs were computed with several product prices to determine the effect of price changes on farm organization and aggregate area output. There were five cotton prices used — base price, plus and minus 20 per cent of base price, and plus and minus 40 per cent of base price. Three prices were used for products from all other included enterprises—base price, plus 30 per cent of base price, and minus 30 per cent of base price. Programs were computed at each combination of these prices.

Allotments

With the assumption of "free" market prices as base prices, no production control or acreage allotments were used in the analysis.

Labor

It was assumed that most productive chores on the farm would be performed by resident labor — the operator or full-time hired men. Seasonal

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2/ The base prices were determined cooperatively by members of the S-42 Technical Committee. This committee is composed of representatives from each of the 12 State Experiment Stations cooperating and from the Econ. Res. Ser., U. S. Dept. Agri. The basic price assumptions were used in each cooperating state, but modifications were made by each State to reflect normal transportation and quality differentials.

Table 2. Assumed Input Prices Used for Programming, Limestone Valley Areas, Alabama

| Item | Unit | Price |
|---|---|---|
| Feed and minerals: | | |
| Corn | bu. | $ 1.75 |
| Cottonseed meal | cwt. | 4.00 |
| Meat and bone scrap (50%) | cwt. | 5.05 |
| Soybean oil meal | cwt. | 4.00 |
| Stillbestrol, per steer (in feed) | hd. | .75 |
| Salt, loose | cwt. | 1.45 |
| Salt, mineralized, swine formula | cwt. | 1.65 |
| Steamed bone meal | cwt. | 5.10 |
| Seed: | | |
| Cotton, acid-delinted | lb. | $ 0.18 |
| Corn | lb. | .18 |
| Oats | bu. | 1.45 |
| Wheat | bu. | 3.15 |
| Soybeans | bu. | 4.00 |
| Grain sorghum | lb. | .14 |
| White clover | lb. | .70 |
| Orchard grass | lb. | .32 |
| Crimson clover | lb. | .30 |
| Alfalfa | lb. | .39 |
| Lespedeza, Korean | lb. | .17 |
| Hairy vetch | lb. | .18 |
| Coastal bermuda sprigs | bu. | 1.00 |
| Fertilizer: | | |
| 4-12-12 | cwt. | $ 2.05 |
| 0-16-8 | cwt. | 1.60 |
| 0-20-20 | cwt. | 2.35 |
| 0-10-20 plus 50 lbs. borax per ton | cwt. | 1.95 |
| Ammonium nitrate | cwt. | 3.60 |
| Pesticides: | | |
| Cotton insecticide | lb. | $ 0.10 |
| DDT (10%) | lb. | .075 |
| Karmex | gal. | 15.00 |
| Post-emergence oil | gal. | .30 |
| Phenothiazine | lb. | .70 |

(Continued)

Table 2 (Continued). Assumed Input Prices Used for Programming, Limestone Valley Areas, Alabama

| Item | Unit | Price |
|---|---|---|
| Custom work: | | |
| Picking cotton, machine | lb. lint | $ 0.06 |
| Applying lime (includes lime) | ton | 4.50 |
| Grinding and mixing, concentrate | cwt. | .25 |
| Grinding and mixing, hay | cwt. | .35 |
| Shelling corn | bu. | .10 |
| Mixing supplement | cwt. | .10 |
| Hauling livestock, commercial | cwt. | .25 |
| Picking corn | acre | 5.00 |
| Combining | acre | 6.00 |
| Miscellaneous: | | |
| Seasonal labor | hr. | $ 0.90 |
| Hoeing cotton | hr. | .40 |
| Ginning cotton, includes bagging and ties | bale | 14.00 |
| Defoliant | lb. | .07 |
| Artificial breeding | hd. | 8.00 |
| Calves, beef feeder | cwt. | 20.25 |

Table 3. Assumed Product Prices and Price Variations Used for Programming, Limestone Valley Areas, Alabama

| Product | Unit | Base price | Variations 1/ |
|---|---|---|---|
| Cotton 2/ | cwt. | $26.00 | ±20% & ±40% |
| Corn | bu. | 1.12 | ±30% |
| Oats | bu. | .64 | ±30% |
| Wheat | bu. | 1.25 | ±30% |
| Alfalfa hay | ton | 26.00 | ±30% |
| Lespedeza hay | ton | 23.00 | ±30% |
| Soybeans | bu. | 2.00 | ±30% |
| Grain sorghum | bu. | 1.08 | ±30% |
| Fat calves | cwt. | 19.00 | ±30% |
| Fat steers | cwt. | 20.00 | ±30% |
| Cull cows | cwt. | 13.50 | ±30% |
| Cull bulls | cwt. | 8.50 | ±30% |
| Slaughter gilts and barrows | cwt. | 15.00 | ±30% |
| Sows | cwt. | 12.50 | ±30% |
| Boars | cwt. | 5.80 | ±30% |
| Eggs | doz. | .35 | None |
| Broilers (contract) | lb. | .025 | None |

1/ This column shows the product price levels that were used in programming in addition to the base price.

2/ Cotton seed was sold at $50.00 per ton regardless of the price of lint.

labor would be hired for such tasks as hoeing cotton, filling fertilizer distributors, and hauling hay. All crops were assumed to be mechanically harvested and on the smaller farms this harvesting was assumed to be custom hired.

The resident labor supply was calculated in units of one man year-round. The part-time resident labor supply consisted of an operator who worked full time off the farm and operated the farm after work hours and on Saturday. A one-man labor supply consisted of a full-time owner-operator. The three-man supply was one full-time owner-operator and two full-time hired men. The monthly distribution for these situations are presented in Table 4.

Table 4. Monthly Distribution of Resident Labor for Specified Labor Forces, Limestone Valley Areas, Alabama

| Month | Labor force | | |
|---|---|---|---|
| | Part-time man | One man | Three men |
| | Hours | Hours | Hours |
| January | 35 | 206 | 618 |
| February | 30 | 194 | 582 |
| March | 40 | 239 | 717 |
| April | 39 | 231 | 693 |
| May | 66 | 266 | 798 |
| June | 64 | 257 | 771 |
| July | 64 | 257 | 771 |
| August | 66 | 266 | 798 |
| September | 64 | 257 | 771 |
| October | 40 | 239 | 717 |
| November | 33 | 199 | 597 |
| December | 35 | 206 | 618 |
| Total | 576 | 2,817 | 8,451 |

Capital

Capital was divided into operating and investment capital. Operating capital is the money used to purchase items normally used in one production period, such as fertilizer, feed, seed, and seasonal labor. Investment capital is the amount of money tied up in resources used for more than one production period. Examples are machinery, storage facilities, buildings for livestock, livestock equipment, breeding herds, and land. However, land was not included in the investment capital figures in this publication since returns were figured as the net returns to resident labor, management, and land.

Operating capital figures were computed by taking the price of appropriate inputs multiplied by the time from use of the input until the returns are received from the enterprise. Time is expressed as a fraction of a year. For example, $12 worth of nitrogen applied 4 months before harvest would add $4 ($12 times 1/3) to operating capital. No additions were made to operating capital if substantial returns occurred within 30 days after incurring an expense. Thus, harvesting costs were not included in operating capital. Most cost items for layers were also excluded because income occurs at very short intervals.

Investment capital, as used in this report, is the average value over the life of an input, and not a new cost. For example, a fence that costs $1,000 to build was entered as $500 of investment capital, since this is the average value of the fence over its useful life.

Interest at 6 per cent on both operating and investment capital (other than investment in land) is included as an expense in the optimum farm plans, regardless of whether the capital is owned or borrowed.

## Representative Farms

The farms of the areas were classified into five major groups according to open land (cropland plus open pasture) on each farm. One of these groups, 0 - 9.9 acres of open land, was considered as nonfarm rural residences. They were not considered in the study. For the remaining farm size groups, a representative farm was chosen for each group (Table 5). The classifications and representative farms were determined from a ten per cent sample of the Agricultural Stabilization and Conservation Service farm records in six Tennessee River Valley counties.

Table 5. Farm Size Groups, Representative Farm Sizes, Limestone Valley Areas, Alabama

| Size group (acres open land) | Acreage on representative farms | | |
|---|---|---|---|
| | Open land (acres) | Plowable land (acres) | Row cropland (acres) |
| Nonfarm (0 to 9.9) | 1/ | 1/ | 1/ |
| Small (10 to 49.9) | 32 | 28.9 | 22.2 |
| Medium ( 50 to 124.9) | 80 | 72.4 | 55.5 |
| Large (125 to 299.9) | 210 | 190.0 | 145.7 |
| Extra large (300 and over) | 635 | 574.4 | 440.7 |

1/ Farms with less than 10 acres considered as rural residences.

## Optimum Organizations for Representative Farms

Individual farm organization is determined by personal preferences and the availability of resources as well as potential profits. However, the use in this study of the term "optimum" denotes only profit maximization. Using the base prices for farm products, optimum programs were computed for each representative farm: (1) with poultry and corn buying for livestock activities considered, (2) with poultry enterprises excluded, and (3) with poultry and corn buying activities excluded.

For the third group, programs were computed with five cotton prices and three prices of other commodities to show the effect of product price variations on farm organization.

Small Farm

The representative small farm had 32 acres of open land with 22.2 acres available for cultivation in row crops. The farm was suitable for a part-time operation with the owner working full time off the farm and operating the farm enterprises after work and on Saturdays. The farm was not large enough to provide a reasonable income for a full-time operator unless large non-land based enterprises were included.

The farm was programmed with a part-time labor supply. A two-plow tractor and appropriate land preparation and cultivating equipment was assumed to be owned by the operator. No harvesting equipment was assumed to be owned by the farm operator. All crops were assumed to be custom harvested.

When poultry enterprises were considered in the program model, no poultry entered the optimum combination of enterprises (Table 6). The program required the purchase of 403 hundredweight of corn and carried 4 sows on the farm. Crops grown on the farm were 11.9 acres of cotton, 5.7 acres of oats, and 9.2 acres of grain sorghum for sale. No corn was grown for feed. Net return to resident labor, management, and land was $1,492. The total investment capital requirement other than land was $3,200. Total resident labor required was 466 hours. Labor was restricting in April and July.

When poultry and corn buying were not permitted in the program, the number of sows in the optimum program was reduced to one. Cotton acreage was increased to 15.7. Grain for sale included 6.6 acres of oats and 3.8

Table 6. Optimum Farm Plans, Small Farm, Part-Time Operator Labor Force, Advanced Technology, Base Prices for All Products, Limestone Valley Areas, Alabama

| Enterprises | Unit | Program assumptions | | |
|---|---|---|---|---|
| | | All enterprises considered | Poultry excluded | Poultry and corn buying excluded |
| Crops: | | | | |
| Cotton (high yield) | acre | 9.3 | 9.3 | 9.3 |
| Cotton (medium yield) | acre | 2.6 | 2.6 | 6.4 |
| Cotton (low yield) | acre | 0.0 | 0.0 | 0.0 |
| Oats | acre | 5.7 | 5.7 | 6.6 |
| Grain sorghum | acre | 9.2 | 9.2 | 3.8 |
| Corn for feed | acre | 0.0 | 0.0 | 2.5 |
| Corn purchased | cwt. | 402.9 | 402.9 | 0.0 |
| Pasture | acre | 2.1 | 2.1 | 0.5 |
| Idle open land | acre | 3.1 | 3.1 | 2.9 |
| Sows | no. | 4.2 | 4.2 | 1.0 |
| Cotton sold | cwt. | 82.1 | 82.1 | 106.7 |
| Feed grain sold | cwt. | 352.9 | 352.9 | 239.9 |
| Net return to resident labor, management, and land | dol. | 1,492 | 1,492 | 1,436 |
| Capital: | | | | |
| Investment 1/ | dol. | 3,200 | 3,200 | 2,747 |
| Operating | dol. | 711 | 711 | 595 |
| Resident labor used | hour | 466 | 466 | 321 |
| Seasonal labor hired | hour | 67 | 67 | 76 |

Resident Labor Distribution for Periods (hours)

| Situation | Dec.-Jan.-Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All enterprises considered | 86 | 30 | 39 | 46 | 63 | 64 | 47 | 33 | 30 | 28 | 466 |
| Poultry excluded | 86 | 30 | 39 | 46 | 63 | 64 | 47 | 33 | 30 | 28 | 466 |
| Poultry & corn buying excluded | 47 | 20 | 39 | 41 | 41 | 39 | 34 | 20 | 21 | 19 | 321 |
| Labor available | 100 | 40 | 39 | 66 | 64 | 64 | 66 | 64 | 40 | 33 | 576 |

1/ Investment capital does not include the investment in land.

acres of grain sorghum, and 2.5 acres of corn was grown for feed. The net return to resident labor, management, and land was $1,436, a decrease of $56. Total investment capital requirement other than land was $2,747, a decrease of $453. Total resident labor required was 321 hours. Labor was the restricting resource only in April.

The programming with poultry and corn buying not considered was expanded to determine the effect of variations in product prices on the optimum organization. The major concern was the effect on cotton production.

With the product price of enterprises competing with cotton at the assumed base prices, no cotton would be planted at a price of 15.6 cents per pound of lint (Table 7). Some cotton would be planted at 20.8 cents per pound but not until a price of 31.2 cents per pound would all the available cotton land be planted.

With the prices of competing enterprises at 30 per cent below base prices, cotton, corn and hogs were the only enterprises with a positive return. At a cotton price of 15.6 cents per pound, the optimum program has 3.9 acres of cotton, 12.5 acres of corn for feed and 4.8 sows. At a cotton price of 20.8 cents per pound or above, it would be most profitable to plant all suitable acreage to cotton with no other enterprises on the farm.

With the price of products competing with cotton raised to 30 per cent above base prices, they competed very effectively with cotton for the available resources. Cotton was not in the optimum program below a price of 26 cents per pound. Not until a cotton price of 36.4 cents per pound was reached was all of the suitable land planted to cotton.

Table 7. Optimum Programs, Small Farm, Part-Time Labor Supply, Specified Prices for Cotton and for Competing Enterprises, Poultry and Corn Buying Activities Not Considered, Advanced Technology, Limestone Valley Areas, Alabama

| Enterprises | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| **Competing enterprises at base prices** | | | | | | |
| Cotton | acre | ---- | 4.5 | 15.7 | 18.6 | 18.6 |
| Corn for feed | acre | 13.3 | 12.0 | 2.4 | ---- | ---- |
| Oats | acre | ---- | 5.7 | 6.6 | 6.8 | 6.8 |
| Grain sorghum | acre | 7.6 | 4.6 | 3.8 | 3.6 | 3.6 |
| Pasture | acre | 2.6 | 2.3 | .4 | ---- | ---- |
| Idle openland | acre | 8.5 | 2.9 | 3.1 | 3.0 | 3.0 |
| Sows | no. | 5.1 | 4.6 | .9 | ---- | ---- |
| Net revenue 1/ | dol. | 1,070.46 | 1,155.04 | 1,435.84 | 2,047.00 | 2,687.70 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 3,098.72 | 3,107.42 | 2,746.82 | 2,654.22 | 2,654.22 |
| Operating | dol. | 541.25 | 678.39 | 595.36 | 574.69 | 574.69 |
| Resident labor | hr. | 421.5 | 445.6 | 320.8 | 288.5 | 288.5 |
| Seasonal labor | hr. | 35.5 | 51.2 | 75.7 | 82.0 | 82.0 |
| **Competing enterprises at 30% below base prices** | | | | | | |
| Cotton | acre | 3.9 | 18.6 | 18.6 | 18.6 | 18.6 |
| Corn for feed | acre | 12.5 | ---- | ---- | ---- | ---- |
| Pasture | acre | 2.4 | ---- | ---- | ---- | ---- |
| Idle openland | acre | 13.2 | 13.4 | 13.4 | 13.4 | 13.4 |
| Sows | no. | 4.8 | ---- | ---- | ---- | ---- |
| Net revenue 1/ | dol. | 232.90 | 698.71 | 1,339.40 | 1,980.10 | 2,620.80 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 3,126.42 | 2,654.22 | 2,654.22 | 2,654.22 | 2,654.22 |
| Operating | dol. | 535.48 | 414.22 | 414.22 | 414.22 | 414.22 |
| Resident labor | hr. | 400.2 | 237.8 | 237.8 | 237.8 | 237.8 |
| Seasonal labor | hr. | 36.4 | 68.7 | 68.7 | 68.7 | 68.7 |
| **Competing enterprises at 30% above base prices** | | | | | | |
| Cotton | acre | ---- | ---- | 4.5 | 9.3 | 18.6 |
| Corn for feed | acre | 13.0 | 13.0 | 12.0 | 7.9 | ---- |
| Oats | acre | 5.6 | 5.6 | 5.7 | 6.0 | 6.8 |
| Grain sorghum | acre | 8.0 | 8.0 | 4.6 | 4.2 | 3.6 |
| Pasture | acre | 2.4 | 2.4 | 2.3 | 1.5 | ---- |
| Idle openland | acre | 3.0 | 3.0 | 2.9 | 3.1 | 3.0 |
| Sows | no. | 4.9 | 4.9 | 4.6 | 3.0 | ---- |
| Net revenue 1/ | dol. | 2,004.33 | 2,004.33 | 2,150.41 | 2,334.77 | 2,831.99 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 3,075.94 | 3,075.94 | 3,107.42 | 2,953.23 | 2,654.22 |
| Operating | dol. | 636.85 | 636.85 | 678.39 | 641.01 | 574.90 |
| Resident labor | hr. | 436.5 | 436.5 | 445.6 | 392.2 | 288.5 |
| Seasonal labor | hr. | 41.6 | 41.6 | 51.2 | 61.8 | 82.0 |

1/ Net return to resident labor, management and land.

2/ Investment capital does not include the investment in land.

These programs indicate that, under the assumed prices, poultry was not a profitable adjustment alternative on the small farm operated with a part-time labor supply. At almost any combination of prices, cotton was a profitable enterprise on these farms, with a corn-hog enterprise the best alternative to cotton. With capital available to buy corn for hog feed, raising hogs would add only a few dollars to net revenue.

Medium Farm

The representative medium farm has 80 acres of open land with 55.5 acres suitable for row crops. The farm was operated by a full-time operator. The assumption was made that there was one three-plow tractor with two-row planter and cultivator on the farm. Where hay crops were in the program, a mower, rake and baler were assumed to be owned. All other crops were assumed to be custom harvested.

When poultry was considered and base prices assumed, 2,120 cage layers were in the optimum program on the medium farm (Table 8). The program included 678 hundredweight of purchased corn, 12 sows, 39.3 acres of cotton, 13.9 acres of oats, and 13.2 acres of corn for feed. Net return to resident labor, management, and land was $7,327 and total investment capital requirement other than land was $11,374. The total labor requirement was 2,525 hours, with labor restricting April and July.

When poultry was not considered, the optimum program increased the purchase of corn to 2,216.9 hundredweight and the number of sows to 27. The acreage of cotton was the same, but oat acreage was reduced to 10.2 and that of corn for feed was reduced to 9.5 acres. Net return to resident labor, management, and land was $6,299, a decrease of $1,029; and investment capital was $7,417, a reduction of $3,957. Total labor re-

Table 8. Optimum Farm Plans, Medium Sized Farm, One-Man Labor Force, Advanced Technology, Base Prices for All Products, Limestone Valley Areas, Alabama

| Enterprises | Unit | Program assumptions: All enterprises considered | Poultry excluded | Poultry and corn buying excluded |
|---|---|---|---|---|
| Poultry: | | | | |
| Caged layers | no. | 2,120 | ---- | ---- |
| Crops: | | | | |
| Cotton (high yield) | acre | 23.2 | 23.2 | 23.2 |
| Cotton (medium yield) | acre | 16.1 | 16.1 | 16.1 |
| Cotton (low yield) | acre | 0.0 | 0.0 | 0.0 |
| Oats | acre | 13.9 | 10.2 | 15.5 |
| Corn for feed | acre | 13.2 | 9.5 | 14.8 |
| Corn purchased | cwt. | 678.06 | 2,216.87 | ---- |
| Pasture | acre | 6.0 | 13.4 | 2.8 |
| Idle openland | acre | 7.6 | 7.6 | 7.6 |
| Sows | no. | 12.1 | 26.9 | 5.6 |
| Cotton sold | cwt. | 267.05 | 267.05 | 267.05 |
| Feed grain sold | cwt. | 310.64 | 228.20 | 346.97 |
| Net return to resident labor, management, and land | dol. | 7,327 | 6,299 | 4,275 |
| Capital required: | | | | |
| Investment 1/ | dol. | 11,374 | 7,417 | 4,001 |
| Operating | dol. | 2,949 | 2,924 | 1,769 |
| Resident labor used | hour | 2,525 | 2,033 | 914 |
| Seasonal labor hired | hour | 181 | 178 | 183 |

1/ Investment capital does not include the investment in land.

Resident Labor Distribution for Periods (hours)

| Situation | Dec.: Jan.: Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All enterprises considered | 576 | 199 | 231 | 247 | 200 | 257 | 236 | 204 | 190 | 185 | 2,525 |
| Poultry excluded | 473 | 158 | 173 | 192 | 142 | 257 | 205 | 175 | 131 | 127 | 2,033 |
| Poultry and corn buying excluded | 160 | 61 | 108 | 117 | 77 | 104 | 96 | 68 | 63 | 60 | 914 |
| Labor available | 606 | 239 | 231 | 266 | 257 | 257 | 266 | 257 | 239 | 199 | 2,817 |

quirement was 2,033 hours, with labor restricting only in July.

When poultry and corn buying were both excluded, there was a large reduction in number of sows and net return to operator. Sows were reduced to six; cotton acreage was again the same. Oats acreage was increased to 15.5 and acreage of corn for feed was increased to 14.8. Net return to resident labor, management, and land was $4,275, a decrease of $2,024 from the program with corn buying permitted, and a decrease of $3,052 from the program with poultry and corn buying. Total investment capital requirement was $4,001, a decrease of $3,416 from the program with corn buying considered, and $7,373 below the program with both poultry and corn buying considered. Total operator labor requirement was 914 hours. Labor was not restricting in any of the periods.

With poultry and corn buying not permitted and with enterprises competing with cotton at base prices, cotton entered the optimum program at a price of 26 cents per pound of lint (Table 9). At a cotton price of 31.2 cents, all of the suitable land was planted to cotton. Again, the corn-hog enterprise was the closest competitor with cotton.

When the product prices of competing enterprises were reduced to 30 per cent below base price, no cotton was planted at a price of 15.6 cents per pound; a corn-hog enterprise was the only enterprise in the optimum program. However, at a price of 20.8 cents per pound all suitable land was planted to cotton.

With competing enterprise prices increased to 30 per cent above base, a corn-hog enterprise with oats planted on the plowable land made up the optimum program until a cotton price of 36.4 cents was reached. At a cotton price of 36.4 cents, some but not all suitable land was planted to cotton.

Table 9. Optimum Programs, Medium Farm, One-Man Labor Supply, Specified Prices for Cotton and for Competing Enterprises, Poultry and Corn Buying Activities Not Considered, Advanced Technology, Limestone Valley Areas, Alabama

| Enterprises | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| **Competing enterprises at base prices** | | | | | | |
| Cotton | acre | ---- | ---- | 39.3 | 47.6 | 47.6 |
| Corn for feed | acre | 50.7 | 50.7 | 14.8 | 7.2 | 7.2 |
| Oats | acre | 12.1 | 12.1 | 15.5 | 16.2 | 16.2 |
| Pasture | acre | 9.6 | 9.6 | 2.8 | 1.9 | 1.9 |
| Idle openland | acre | 7.6 | 7.6 | 7.6 | 7.1 | 7.1 |
| Sows | no. | 19.3 | 19.3 | 5.6 | 2.8 | 2.8 |
| Net revenue 1/ | dol. | 3,954.90 | 3,954.90 | 4,275.39 | 5,793.77 | 7,430.60 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 5,908.50 | 5,908.50 | 4,000.53 | 3,597.58 | 3,597.58 |
| Operating | dol. | 2,082.88 | 2,082.88 | 1,769.13 | 1,706.34 | 1,706.34 |
| Resident labor | hr. | 1,416.3 | 1,416.3 | 913.9 | 807.8 | 807.8 |
| Seasonal labor | hr. | 97.0 | 97.0 | 182.9 | 201.1 | 201.1 |
| **Competing enterprises at 30% below base prices** | | | | | | |
| Cotton | acre | ---- | 47.6 | 47.6 | 47.6 | 47.6 |
| Corn for feed | acre | 50.7 | 7.2 | 7.2 | 7.2 | 7.2 |
| Pasture | acre | 9.6 | 1.4 | 1.4 | 1.4 | 1.4 |
| Idle openland | acre | 19.7 | 23.8 | 23.8 | 23.8 | 23.8 |
| Sows | no. | 19.3 | 2.8 | 2.8 | 2.8 | 2.8 |
| Net revenue 1/ | dol. | 968.41 | 2,004.13 | 3,640.96 | 5,277.79 | 6,914.62 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 5,908.50 | 3,597.58 | 3,597.58 | 3,597.58 | 3,597.58 |
| Operating | dol. | 1,851.50 | 1,397.40 | 1,397.40 | 1,397.40 | 1,397.40 |
| Resident labor | hr. | 1,375.3 | 752.6 | 752.6 | 752.6 | 752.6 |
| Seasonal labor | hr. | 83.7 | 183.3 | 183.3 | 183.3 | 183.3 |
| **Competing enterprises at 30% above base prices** | | | | | | |
| Cotton | acre | ---- | ---- | ---- | ---- | 39.3 |
| Corn for feed | acre | 50.7 | 50.7 | 50.7 | 50.7 | 14.8 |
| Oats | acre | 12.1 | 12.1 | 12.1 | 12.1 | 15.5 |
| Pasture | acre | 9.6 | 9.6 | 9.6 | 9.6 | 2.8 |
| Idle openland | acre | 7.6 | 7.6 | 7.6 | 7.6 | 7.6 |
| Sows | no. | 19.3 | 19.3 | 19.3 | 19.3 | 5.6 |
| Net revenue 1/ | dol. | 7,027.92 | 7,027.92 | 7,027.92 | 7,027.92 | 8,110.53 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 5,908.50 | 5,908.50 | 5,908.50 | 5,908.50 | 4,000.53 |
| Operating | dol. | 2,082.88 | 2,082.88 | 2,082.88 | 2,082.88 | 1,773.76 |
| Resident labor | hr. | 1,416.3 | 1,416.3 | 1,416.3 | 1,416.3 | 913.9 |
| Seasonal labor | hr. | 97.0 | 97.0 | 97.0 | 97.0 | 182.9 |

1/ Net return to resident labor, management and land.

2/ Investment capital does not include the investment in land.

A one-man equivalent labor supply on the medium farm gave excessive labor for a primary cotton farm. This labor could be utilized very profitably either in a poultry enterprise or a corn-hog enterprise. If corn buying for hog feed was permitted, a sizable acreage of cotton and a large number of sows would be profitable. With corn buying eliminated, cotton and corn for feed competed for the available row cropland. At the low cotton prices, corn-hogs was more profitable. Only at the higher cotton prices did cotton come into the optimum program.

Large Farm

The representative large farm consisted of 210 acres of open land with 145.7 acres suitable for row crop cultivation. The original intention was for a two-man labor supply on this farm. However, preliminary programming at base prices and without poultry enterprises indicated that the increase in net returns when two men were used over the net returns for one-man labor supply was not sufficient to pay the wages of the second man. Therefore, the labor supply was limited to one full-time operator on this farm situation.

The operator was assumed to own one three-plow tractor with four-row planters and cultivators and another three-plow tractor when enough cotton was produced to make it profitable to own a one-row cotton picker. He was assumed also to own a combine, cornpicker, and hay making equipment where needed.

When poultry was considered, 52,360 contract broilers were in the optimum combination (Table 10). The program also included 15 sows, 63.9 acres of cotton, 31.1 acres of corn for sale, 38.9 acres of corn for feed, 8.1 acres of alfalfa hay, and 40.6 acres of lespedeza hay.

Table 10. Optimum Farm Plans, Large Farm, One-Man Labor Force, Advanced Technology, Base Prices for All Products, Limestone Valley Areas, Alabama

| Enterprises | Unit | Program assumptions: All enterprises considered | Poultry excluded | Poultry and corn buying excluded |
|---|---|---|---|---|
| Poultry: | | | | |
| Broilers | no. | 52,360 1/ | ---- | ---- |
| Crops: | | | | |
| Cotton (high yield) | acre | 60.8 | 60.8 | 60.8 |
| Cotton (medium yield) | acre | 3.1 | 0.0 | 0.0 |
| Cotton (low yield) | acre | 0.0 | 0.0 | 0.0 |
| Corn for sale | acre | 31.1 | 11.5 | 11.5 |
| Corn for feed | acre | 38.9 | 55.5 | 55.5 |
| Alfalfa hay | acre | 8.1 | 12.6 | 12.6 |
| Lespedeza hay | acre | 40.6 | 36.6 | 36.6 |
| Corn purchased | cwt. | 0.0 | 0.0 | 0.0 |
| Pasture | acre | 7.4 | 10.6 | 10.6 |
| Idle openland | acre | 20.0 | 22.4 | 22.4 |
| Sows | no. | 14.8 | 21.2 | 21.2 |
| Cotton sold | cwt. | 445.55 | 425.6 | 425.6 |
| Feed grain sold | cwt. | 1,133.28 | 419.85 | 419.85 |
| Net return to resident labor, management and land | dol. | 11,683 | 11,619 | 11,619 |
| Capital required: | | | | |
| Investment 2/ | dol. | 19,397 | 15,153 | 15,153 |
| Operating | dol. | 4,328 | 4,265 | 4,265 |
| Resident labor used | hr. | 2,605 | 2,492 | 2,492 |
| Seasonal labor hired | hr. | 686 | 693 | 693 |

1/ Four batches of 13,090 each.

2/ Investment capital does not include the investment in land.

Resident Labor Requirement by Periods (hours)

| Situation | Dec. Jan. Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All enterprises considered | 585 | 222 | 231 | 255 | 153 | 257 | 266 | 211 | 239 | 186 | 2,605 |
| Poultry excluded | 566 | 195 | 204 | 232 | 127 | 257 | 266 | 211 | 239 | 195 | 2,492 |
| Poultry and corn buying excluded | 566 | 195 | 204 | 232 | 127 | 257 | 266 | 211 | 239 | 195 | 2,492 |
| Labor available | 606 | 239 | 231 | 266 | 257 | 257 | 266 | 257 | 239 | 199 | 2,817 |

No corn was purchased in this program. The net return to resident labor, management and land was $11,683 and investment capital requirement other than land was $19,397. The total resident labor requirement was 2,605 hours, and labor was restricting in April, July, August, and October.

When the poultry enterprise was eliminated, still no corn was purchased so that the optimum combination with corn buying or without corn buying considered were the same. Number of sows was increased to 21, corn for feed was increased to 55.5 acres, and corn for sale decreased to 11.5 acres. Cotton acreage was 60.8 acres. Alfalfa hay acreage increased to 12.6 acres and lespedeza hay decreased to 36.6 acres. Net return to resident labor, management, and land was $11,619 a decrease of $64. Investment capital requirement other than land was $15,153, a decrease of $4,244. Total resident labor requirement was 2,492 hours, with labor restricting in July, August, and October.

With poultry and corn buying not permitted and enterprises competing with cotton at base prices, some cotton was profitable at a price of 20.8 cents per pound (Table 11). Both corn for grain and corn-hog enterprises were in the optimum program at this cotton price or below. At a cotton price of 26 cents, the cotton acreage increased but some corn for grain was still planted. At 31.2-cent cotton, corn for grain and corn-hogs were not in the optimum program. However, because of lack of labor in critical periods, the total acreage of cotton planted at this price did not use all of the suitable cotton land. Since alfalfa and lespedeza hay did not compete with cotton for labor in these critical periods, they came into the optimum program to use the available land.

With competing enterprises at 30 per cent below base prices, most of the high yielding cotton acreage would be planted at a cotton price

Table 11. Optimum Programs, Large Farm, One-Man Labor Supply, Specified Prices for Cotton and for Competing Enterprises, Poultry and Corn Buying Activities Not Considered, Advanced Technology, Limestone Valley Areas, Alabama

| Enterprises | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| **Competing enterprises at base prices** | | | | | | |
| Cotton | acre | ---- | 43.7 | 60.8 | 103.9 | 103.9 |
| Corn for grain | acre | 31.9 | 22.9 | 11.5 | ---- | ---- |
| Corn for feed | acre | 77.4 | 69.2 | 55.5 | ---- | ---- |
| Oats | acre | 36.9 | 37.7 | ---- | ---- | ---- |
| Alfalfa hay | acre | 28.9 | 3.3 | 12.6 | 41.8 | 41.8 |
| Lespedeza hay | acre | ---- | ---- | 36.6 | 44.3 | 44.3 |
| Pasture | acre | 14.8 | 13.2 | 10.6 | ---- | ---- |
| Idle openland | acre | 20.1 | 20.0 | 22.4 | 20.0 | 20.0 |
| Sows | no. | 29.5 | 26.4 | 21.2 | ---- | ---- |
| Net revenue 1/ | dol. | 8,477.31 | 9,623.02 | 11,619.49 | 15,076.11 | 18,742.91 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 14,233.92 | 14,921.01 | 15,153.47 | 14,230.82 | 14,230.82 |
| Operating | dol. | 4,224.10 | 4,651.74 | 4,265.09 | 3,692.82 | 3,692.82 |
| Resident labor | hr. | 2,417.2 | 2,559.8 | 2,491.0 | 1,808.7 | 1,808.7 |
| Seasonal labor | hr. | 589.4 | 510.9 | 692.7 | 1,052.5 | 1,052.5 |
| **Competing enterprises at 30% below base prices** | | | | | | |
| Cotton | acre | 57.4 | 103.1 | 103.9 | 103.9 | 103.9 |
| Corn for grain | acre | 26.3 | 4.7 | ---- | ---- | ---- |
| Corn for feed | acre | 56.6 | ---- | ---- | ---- | ---- |
| Alfalfa hay | acre | ---- | 37.9 | 41.8 | 41.8 | 41.8 |
| Pasture | acre | 10.8 | ---- | ---- | ---- | ---- |
| Idle openland | acre | 58.9 | 64.3 | 64.3 | 64.3 | 64.3 |
| Sows | no. | 21.6 | ---- | ---- | ---- | ---- |
| Net revenue 1/ | dol. | 3,189.66 | 6,251.46 | 9,908.78 | 13,575.58 | 17,242.51 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 13,663.45 | 12,695.13 | 12,804.39 | 12,804.39 | 12,804.39 |
| Operating | dol. | 3,890.07 | 3,259.63 | 3,271.97 | 3,271.97 | 3,271.97 |
| Resident labor | hr. | 2,278.7 | 1,576.0 | 1,591.7 | 1,591.7 | 1,591.7 |
| Seasonal labor | hr. | 455.5 | 823.8 | 879.7 | 879.7 | 879.7 |

(Continued)

Table 11 (Continued). Optimum Program, Large Farm One-Man Labor Supply, Specified Prices for Cotton and for Competing Enterprises, Poultry and Corn Buying Activities Not Considered, Advanced Technology, Limestone Valley Areas, Alabama

| Enterprises | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| Competing enterprises at 30% above base prices | | | | | | |
| Cotton | acre | ---- | ---- | 39.8 | 56.3 | 87.5 |
| Corn for grain | acre | 35.5 | 35.5 | 25.2 | 15.6 | ---- |
| Corn for feed | acre | 75.2 | 75.2 | 71.9 | 60.5 | 22.1 |
| Oats | acre | 37.1 | 37.1 | 37.4 | ---- | ---- |
| Alfalfa hay | acre | 27.8 | 27.8 | 2.0 | 7.5 | 34.0 |
| Lespedeza hay | acre | ---- | ---- | ---- | 37.6 | 42.2 |
| Pasture | acre | 34.4 | 34.4 | 13.7 | 11.6 | 4.2 |
| Idle openland | acre | ---- | ---- | 20.0 | 20.9 | 20.0 |
| Sows | no. | 28.7 | 28.7 | 27.4 | 23.1 | 8.4 |
| Beef cows | no. | 9.0 | 9.0 | ---- | ---- | ---- |
| Net revenue 1/ | dol. | 15,057.98 | 15,057.98 | 16,307.14 | 18,111.69 | 20,526.21 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 16,492.88 | 16,492.88 | 14,853.28 | 15,225.99 | 14,736.04 |
| Operating | dol. | 3,803.86 | 3,803.86 | 4,650.54 | 4,324.15 | 3,939.36 |
| Resident labor | hr. | 2,443.2 | 2,443.2 | 2,579.4 | 2,552.3 | 2,100.4 |
| Seasonal labor | hr. | 620.6 | 620.6 | 492.3 | 650.9 | 924.0 |

1/ Net return to resident labor, management and land.

2/ Investment capital does not include the investment in land.

of 15.6 cents. Corn for grain and corn-hog enterprises would also be in the optimum program. At a 20.8-cent cotton price, the high and medium-yield cotton acreage would be planted. The corn-hog enterprise would go out of the optimum organization. A small acreage of corn for grain and alfalfa hay were in the program. At a cotton price of 26 cents or above, cotton and alfalfa hay were the only enterprises in the optimum organization.

With competing enterprises at 30 per cent above base prices, cotton entered the optimum organization at a price of 26 cents per pound. However, even at a price of 36.4 cents per pound, the cotton acreage did not reach the level planted at this price with competing enterprises at base prices or below. At a cotton price of 15.6 or 20.8 cents per pound, beef cows were in the optimum organization.

This farm with one full-time man presented a situation with a limited labor supply. Therefore, changing the product price of one enterprise could change the optimum program. Cotton, corn, and hogs competed for labor in the same periods. Enterprises that did not use labor in these periods entered the optimum programs to utilize the available land.

Extra Large Farm

The representative extra large farm had 635 acres of open land with 440.7 acres of this suitable for row crop cultivation. This farm required more than one man to operate it. Preliminary programming without poultry and corn buying and at base prices indicated that a three-man operation was most practical. The final analysis was made assuming a three-man equivalent labor supply.

The operator was assumed to have three three-plow tractors with four-row planters and cultivators. He was also assumed to own a two-

row self-propelled cotton picker, a combine, corn pickers, and hay-making equipment where needed.

With poultry and corn buying both considered in the model, the optimum enterprise combination included 2,170 cage layers but no corn buying (Table 12). The plan also had 377.7 acres of cotton, 10.4 acres of corn for sale, 48 acres of corn for feed, 129.1 acres of oats, and 18 sows. The net return to resident labor, management, and land was $44,094 3/ and total investment capital requirement other than land was $35,602. The total resident labor requirement was 6,980 hours, with labor restricting in April, July, and August.

With poultry eliminated, the optimum program included purchases of 1,209 hundredweight of corn and increased the number of sows to 34. The cotton acreage increased slightly, oats acreage decreased slightly, and no corn was grown for sale. The net return to resident labor, management, and land was $43,105, a decrease of $989. Investment capital requirement other than land was $31,474, a decrease of $4,128. The total resident labor requirement was 6,479 hours, with labor restricting only in July.

When poultry and corn buying both were eliminated, much of the poorer cotton land was utilized for producing corn for feed and sows were increased to 41. There were 106.3 acres of corn for feed and 123.6 acres of oats. This program also had 27 brood cows in the optimum plan. The

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3/ This figure included returns to all resident labor, including both the operator and the two full-time hired men. To make the figure a return to operator labor, management, and land, substract a total of $5,600 to account for cash wages and perquisites for the two full-time hired men.

Table 12. Optimum Farm Plans, Extra Large Farm, Three-Man Labor Force, Advanced Technology, Base Prices for All Products, Limestone Valley Areas, Alabama

| Enterprises | Unit | Program assumptions | | |
|---|---|---|---|---|
| | | All enterprises considered | Poultry excluded | Poultry and corn buying excluded |
| Poultry: | | | | |
| Caged layers | no. | 2,170 | 0.0 | 0.0 |
| Crops: | | | | |
| Cotton (high yield) | acre | 184.0 | 184.0 | 184.0 |
| Cotton (medium yield | acre | 127.9 | 127.9 | 127.9 |
| Cotton (low yield) | acre | 65.8 | 65.8 | 12.4 |
| Corn for sale | acre | 10.4 | 0.0 | 0.0 |
| Corn for feed | acre | 48.0 | 54.6 | 106.3 |
| Oats | acre | 129.1 | 125.3 | 123.6 |
| Corn purchased | cwt. | 0.0 | 1,208.77 | 0.0 |
| Pasture | acre | 9.2 | 16.8 | 80.8 |
| Idle openland | acre | 60.6 | 60.6 | 0.0 |
| Sows | no. | 18.3 | 33.5 | 40.6 |
| Beef cows | no. | 0.0 | 0.0 | 27.0 |
| Cotton sold | cwt. | 2,497.7 | 2,497.7 | 2,190.37 |
| Feed grain sold | cwt. | 3,272.1 | 2,807.27 | 2,767.80 |
| Net return to resident labor, management, and land | dol. | 44,094 | 43,105 | 42,569 |
| Capital required: | | | | |
| Investment 1/ | dol. | 35,602 | 31,474 | 38,231 |
| Operating | dol. | 15,004 | 14,987 | 14,460 |
| Resident labor used | hr. | 6,980 | 6,480 | 6,749 |
| Seasonal labor hired | hr. | 2,059 | 2,048 | 2,041 |

1/ Investment capital does not include the investment in land.

Resident Labor Requirement by Periods (hours)

| Situation | Dec.-Jan.-Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All enterprises considered | 1,190 | 447 | 693 | 681 | 504 | 771 | 798 | 632 | 688 | 576 | 6,980 |
| Poultry excluded | 1,084 | 405 | 635 | 627 | 445 | 771 | 765 | 604 | 627 | 516 | 6,479 |
| Poultry & corn buying excluded | 1,227 | 435 | 640 | 653 | 468 | 771 | 776 | 616 | 627 | 536 | 6,749 |
| Labor available | 1,818 | 717 | 693 | 798 | 771 | 771 | 798 | 771 | 717 | 597 | 8,451 |

net return to resident labor, management, and land was $42,569. This was only $536 less than in the program with corn buying considered, and $1,525 less than in the program that included poultry and corn buying. Investment capital requirement other than land was $38,231, an increase of $6,757 over the program with corn buying considered, and $2,629 above the program with both poultry and corn buying. The total resident labor requirement was 6,749 hours, with labor restricting only in July.

With poultry and corn buying activities eliminated and enterprises competing with cotton at base prices, cotton entered the optimum program at a price of 20.8 cents per pound (Table 13). At a price of 31.2 cents per pound all of the suitable land was planted to cotton. Corn-hogs, oats, and beef cows were other enterprises in the optimum program with cotton. At a cotton price of 15.6 cents per pound, no cotton was in the optimum program. Corn for grain and lespedeza hay enterprises were added and the corn-hog enterprise increased to utilize the land.

With competing enterprises at 30 per cent below base prices, cotton entered the optimum program at a price of 15.6 cents per pound. At 20.8 cents per pound, all of the suitable cotton land was planted. The corn-hog enterprise was the only other enterprise in these programs.

With competing enterprises at 30 per cent above base prices, cotton entered the optimum program at a price of 26 cents per pound. However, all of the land suitable for cotton was not planted in cotton until a cotton price of 36.4 cents per pound was reached. In the optimum programs with no cotton planted, corn for grain, and lespedeza hay were added and the corn-hog enterprise was increased.

Table 13. Optimum Programs, Extra Large Farm, Three-Man Labor Supply, Specified Prices for Cotton and for Competing Enterprises, Poultry and Corn Buying Activities Not Considered, Advanced Technology, Limestone Valley Areas, Alabama

| Enterprises | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| **Competing enterprises at base prices** | | | | | | |
| Cotton | acre | ---- | 302.9 | 324.3 | 377.7 | 377.7 |
| Corn for grain | acre | 109.8 | ---- | ---- | ---- | ---- |
| Corn for feed | acre | 225.0 | 125.8 | 106.3 | 57.5 | 57.5 |
| Oats | acre | 112.2 | 121.7 | 123.6 | 128.2 | 128.2 |
| Lespedeza hay | acre | 84.5 | ---- | ---- | ---- | ---- |
| Pasture | acre | 103.5 | 24.0 | 80.8 | 71.6 | 71.6 |
| Idle openland | acre | ---- | 60.6 | ---- | ---- | ---- |
| Sows | no. | 85.5 | 48.0 | 40.6 | 21.9 | 21.9 |
| Beef cows | no. | 27.0 | ---- | 27.0 | 27.0 | 27.0 |
| Net revenue 1/ | dol. | 26,826.38 | 31,456.35 | 42,569.26 | 55,315.24 | 68,303.28 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 36,165.03 | 31,551.29 | 38,231.10 | 36,868.55 | 36,868.55 |
| Operating | dol. | 12,373.15 | 14,733.21 | 14,459.61 | 14,186.25 | 14,186.25 |
| Resident labor | hr. | 7,338.2 | 6,787.8 | 6,748.1 | 6,086.5 | 6,086.5 |
| Seasonal labor | hr. | 1,878.9 | 1,873.7 | 2,041.0 | 2,171.7 | 2,171.7 |
| **Competing enterprises at 30% below base prices** | | | | | | |
| Cotton | acre | 302.9 | 377.7 | 377.7 | 377.7 | 377.7 |
| Corn for feed | acre | 125.8 | 57.5 | 57.5 | 57.5 | 57.5 |
| Pasture | acre | 24.0 | 10.9 | 10.9 | 10.9 | 10.9 |
| Idle openland | acre | 182.3 | 188.9 | 188.9 | 188.9 | 188.9 |
| Sows | no. | 48.0 | 21.9 | 21.9 | 21.9 | 21.9 |
| Net revenue 1/ | dol. | 11,951.16 | 24,081.39 | 37,069.44 | 50.057.48 | 63,045.52 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 31,551.29 | 28,573.59 | 28,573.59 | 28,573.59 | 28,573.59 |
| Operating | dol. | 12,581.92 | 11,850.68 | 11,850.68 | 11,850.68 | 11,850.68 |
| Resident labor | hr. | 6,787.8 | 5,426.0 | 5,426.0 | 5,426.0 | 5,426.0 |
| Seasonal labor | hr. | 1,666.3 | 1,838.6 | 1,838.6 | 1,838.6 | 1,838.6 |

(Continued)

Table 13 (Continued). Optimum Programs, Extra Large Farm, Three-Man Labor Supply, Specified Prices for Cotton and for Competing Enterprises, Poultry and Corn Buying Activities Not Considered, Advanced Technology, Limestone Valley Areas, Alabama

| Enterprises | Unit | Cotton prices (cents per pound of lint) 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
|---|---|---|---|---|---|---|
| Competing enterprises at 30% above base prices | | | | | | |
| Cotton | acre | ---- | ---- | 184.0 | 324.1 | 377.7 |
| Corn for grain | acre | 109.8 | 109.8 | 62.3 | ---- | ---- |
| Corn for feed | acre | 225.0 | 225.0 | 177.5 | 106.3 | 57.5 |
| Oats | acre | 112.2 | 112.2 | 116.8 | 123.6 | 128.2 |
| Lespedeza hay | acre | 84.5 | 84.5 | ---- | ---- | ---- |
| Pasture | acre | 103.5 | 103.5 | 94.4 | 81.0 | 71.6 |
| Sows | no. | 85.8 | 85.8 | 67.7 | 40.6 | 21.9 |
| Beef cows | no. | 27.0 | 27.0 | 27.0 | 27.0 | 27.0 |
| Net revenue 1/ | dol. | 46,799.44 | 46,799.44 | 51,873.52 | 62,497.62 | 74,101.01 |
| Capital: | | | | | | |
| Investment 2/ | dol. | 36,165.03 | 36,165.03 | 38,376.37 | 38,231.10 | 36,868.55 |
| Operating | dol. | 12,374.65 | 12,374.65 | 14,214.57 | 14,699.30 | 14,424.14 |
| Resident labor | hr. | 7,338.2 | 7,338.2 | 7,327.5 | 6,748.1 | 6,086.5 |
| Seasonal labor | hr. | 1,878.9 | 1,878.9 | 1,713.4 | 2,041.0 | 2,171.7 |

1/ Net return to resident labor, management and land.

2/ Investment capital does not include investment in land.

Comparison of Responses for Different Size Groups

On all but the small farm, there was some decrease in net return to resident labor, management, and land, when poultry enterprises were eliminated from the enterprises considered. On all but the large farm, there was a further decrease in net return when corn buying to feed hogs was eliminated. This decrease was relatively small except in the case of the medium farm (80 acres of open land). On the medium farm, less than a third of the labor supply was used, and the excess labor could be profitably used either in poultry enterprises or in an expanded hog program in which some feed grain must be purchased. In each of the other farm situations, the inclusion of poultry in the optimum program required almost all available labor to be used for productive activities. Since there would be little time available for maintenance and repair, it was unlikely that the indicated levels of production could be maintained over a long period of time. Although the net return did decrease when the poultry and corn buying activities were eliminated, the labor requirement and distribution for the optimum programs without poultry and corn buying was much more desirable.

In the programming with different combinations of product prices, cotton and a corn-hog enterprise were the most profitable and most competitive for the limited resources. The major effect of changing product prices was, in most cases, a change in the proportion of these enterprises in the optimum program. The major exception to this pattern was on the large farm where the scarcity of labor would neither permit the maximum acreage of cotton nor a large corn-hog enterprise. On this farm enterprises that were not highly competitive with cotton or corn for labor at critical periods entered the optimum program at all levels to use the available land.

## Aggregate Area Supply Response

Optimum enterprise combinations for maximum returns to resident labor, management, and land have been presented for various combinations of product prices and for four representative farm situations. The purpose of this analysis was to determine feasible adjustment opportunities for the individual farmer. These individual farm programs were aggregated to determine the production and resource use for the acres for each price combination. This required determination of the total acreage of limestone soils in the area and the number of representative farms this total acreage would accommodate.

### Soil Base for Aggregation

The acreage and soil capability classes of limestone, flood plain, and similar soils in northern Alabama were determined from the county work sheets of the N-2 forms used in the Soil Conservation Service's Soil and Water Conservation Needs Inventory. For this study, soils in capability classes I, II, III, and IV, which were currently being used for cropland or open pasture land, were designated as open land (Table 14). Of these, all soils in capability classes I and II were designated row cropland. Since the Soil Conservation Service recommends a crop sod rotation for capability class III land, one-half of the class IIIe and IIIw land was designated as row cropland with the other one-half designated as plowable land suitable only for close growing crops. Class IIIs land was also considered plowable land suitable only for crops other than row crops. Class IV land was considered as open land suited only to permanent sod. The total acreages in each classification also are given in Table 14.

Table 14. Limestone Valley and Flood Plains Soils of Northern Alabama, by Current Use and Capability Class 1/ and Classification as Used in Study

| Class | Current Use | |
|---|---|---|
| | Cropland | Pasture |
| | (acres) | (acres) |
| 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 used in 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 ½ Class IIIe and IIIw cropland and pasture | 1,115,397 |

1/ Determined from county work sheets for the Alabama Soil and Water Conservation Needs Inventory. The definition of the land capability classes are found in Alabama Soil and Water Conservation Needs Inventory published by the State Soil Conservation Committee, 1961.

Aggregation Models

The soil base acreage determined above includes all the limestone and similar soils. Some of this acreage is presently being used for dairy farms, vegetables, and fruit and nut trees, which have been excluded as adjustment opportunities for this study. Similarily, the farms with 0.0 to 9.9 acres of open land were classified as nonfarm rural residences and were not studied for adjustment opportunities.

The land utilized by these excluded situations was eliminated from the base acreage before determining the area aggregates.

Furthermore, any number of assumptions can be made as to which groups of farmers actually would make the specified adjustment. For this analysis, two such sets of assumptions have been made and for brevity each set is called a model.

Model One. Model One assumes that all of the farms and acreages not specifically excluded above will make farming adjustments as specified by the optimum representative farm programs for their size group.

Model Two. Model Two further assumes that there would be no adjustment on farms and acreages that were classified as Economic Class VI, part-time or semi-retired farmers in the 1959 Census of Agriculture. The acreages in these farms not previously excluded were excluded in Model Two. All other farms would make the adjustment in farm organization as specified by the optimum representative farm program for their size group.

Further variations in the aggregate estimates were made by using two farm size distributions. The 1959 distribution represents the estimated distribution of the various farm size groups and excluded situations that existed in 1959. Using projected changes in farm sizes, an estimate was made of the expected farm size distribution for 1975. The estimated excluded acreage for the two farm size distributions are given in Table 15.

After these exclusions were made, the remaining acreage was distributed to the various size groups according to distributions determined above (Table 16). The acreage in each size group was then divided by the open

Table 15. Excluded Acreages of Open Land, by Type of Farm, Limestone Valley Areas, Alabama

| Item | Farm size distribution | |
|---|---|---|
| | 1959 | 1975 |
| | Open land acreage | |
| Dairy farms | 55,000 | 55,000 |
| Vegetables, fruits, and nuts | 7,000 | 7,000 |
| Nonfarm rural residencies | 9,265 | 16,365 |
| Class VI, part-time and semi-retired farmers | 121,024 | 121,024 |
| Total Model One exclusion | 71,265 | 78,365 |
| Total Model Two exclusion | 192,289 | 199,389 |

Table 16. Estimated Acreages of Open Land for Aggregation and Maximum Number of Representative Farms, by Size Groups and by Aggregation Models, Limestone Valley Areas, Alabama

| Size groups (Openland acreage) | Open land acreage: Farm size distribution | | Representative farms: Farm size distribution | |
|---|---|---|---|---|
| | 1959 | 1975 | 1959 | 1975 |
| | (acres) | | (number) | |
| | Model One | | | |
| Small (10 - 49.9) | 345,600 | 216,000 | 10,800 | 6,750 |
| Medium (50 - 124.9) | 449,600 | 170,000 | 5,620 | 2,125 |
| Large (125 - 299.9) | 325,500 | 600,600 | 1,550 | 2,860 |
| Extra large (300 and over) | 415,925 | 542,925 | 655 | 855 |
| Total | 1,536,625 | 1,529,525 | 18,625 | 12,590 |
| | Model Two | | | |
| Small (10 - 49.9) | 236,864 | 107,296 | 7,402 | 3,353 |
| Medium (50 - 124.9) | 437,440 | 157,680 | 5,468 | 1,971 |
| Large (125 - 299.9) | 325,560 | 600,600 | 1,550 | 2,860 |
| Extra large (300 and over) | 415,925 | 542,925 | 655 | 855 |
| Total | 1,415,729 | 1,408,501 | 15,075 | 9,039 |

land acreage on the representative farm for that size group to determine the number of representative farms for that acreage. These farm numbers were used to expand the representative farm optimum programs to the area estimates or aggregates.

The Aggregates

The above assumptions established two aggregating models with six sets of assumptions for each. With each model, aggregate area production and resource use can be determined at the five cotton prices for three sets of prices for enterprises competing with cotton and for two farm size distributions.

Model One Aggregates. The aggregates for Model One assume full adjustment to the optimum program of all adjustable resources in the area (Appendix Table 1 through 6). Therefore, cotton production at each price level for any set of assumptions is an estimate of a point on a normative supply curve for cotton for that given set of assumptions. These points have been plotted and the corresponding supply curve drawn for the six sets of assumptions in Model One (Figure 2). Similarly, a net revenue function has been plotted for each set of assumptions.

In each case, the aggregates for the 1959 farm size distribution gave a generally more elastic cotton supply function than the aggregates for the 1975 farm size distribution. The 1959 farm size distribution has a higher proportion of acreage in smaller farms and a lower proportion in the larger farms than the 1975 distributions. The optimum programs indicate a higher percentage of the possible cotton production would be produced at lower prices on the larger farms than on the smaller farms.

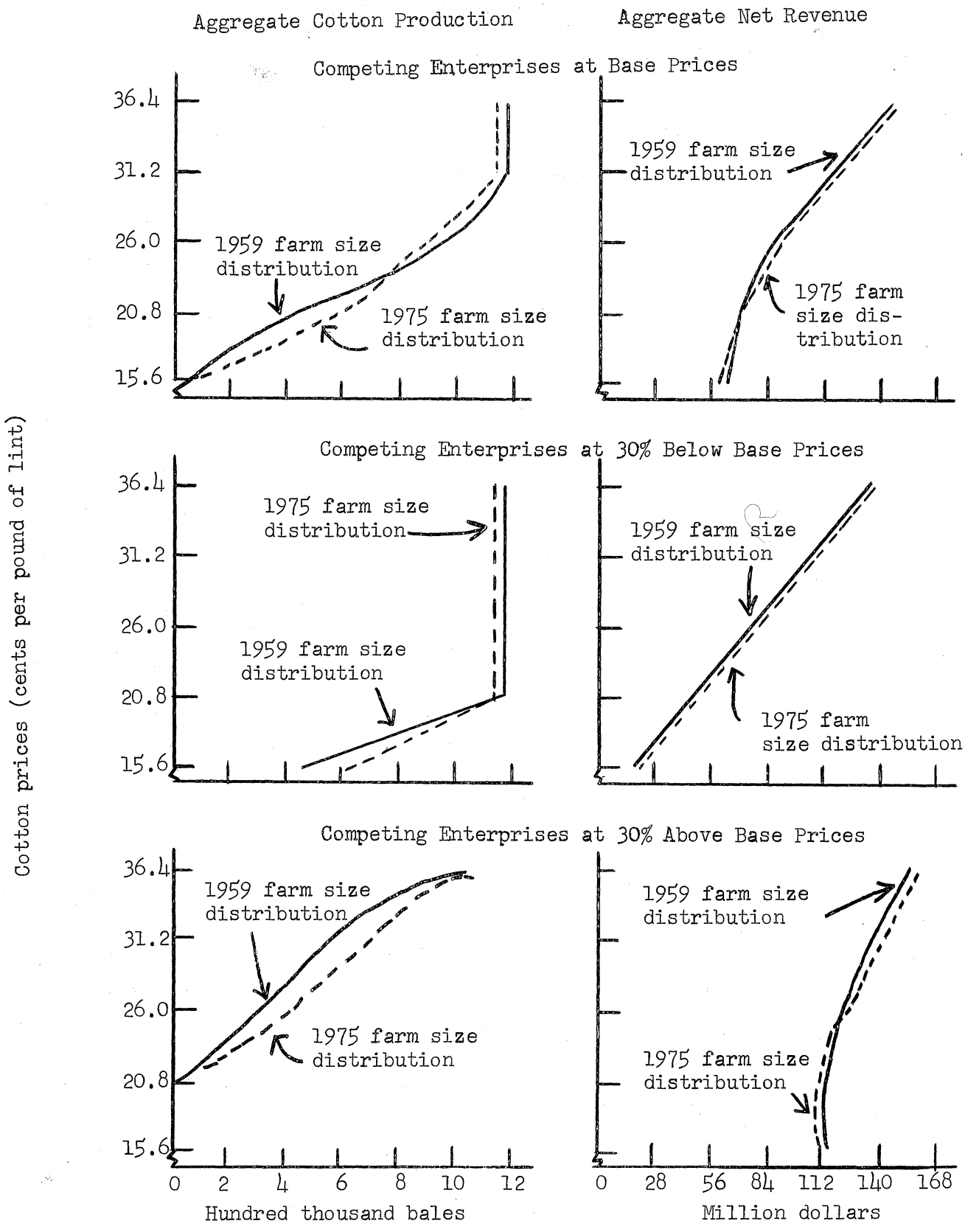


Figure 2. Model I Estimated Aggregate Cotton Production and Aggregate Net Revenue with a Range of Cotton Prices and Three Prices of Products from Competing Enterprises, Limestone Valley Areas, Alabama

Apparently, the comparative advantage of cotton over other enterprises is greater on the larger farms than on the smaller farms.

Model Two Aggregates. The assumption that part of the resources in the area would not adjust causes the aggregates under Model Two to become pseudo-optimum estimates. The estimates for the adjustment-responding acreage were determined from the optimum programs. The estimates for the nonadjustment acreage were determined from the 1959 census data and are for the current organization. It would be possible to add the two estimates of acreage and production to determine total acreage and production. However, the net revenue, operating capital, investment capital, and labor used on the nonadjusting farms were indeterminate so that an overall estimate of these could not be obtained. Therefore, to make all the estimates compatible, they are presented in two categories. The data in Table 17 show the current acreage and production of important enterprises on the nonadjustment responding farms. The Model Two aggregates in Appendix Tables 7 through 12 are only for the resources that were assumed to make full adjustment.

Similar estimates of supply curves and net revenue functions were made for the adjusting resources of Model Two as were made for Model One (Figure 3). These functions have the same general relationships as the Model One functions. However, both farm size distributions for Model Two had a smaller proportion of the acreage in the smaller farm group than did Model One. Thus, the differences between the curves for the 1959 distribution and the 1975 distribution are less for Model Two than for Model One.

Table 17. Resources and Production Estimates for Nonrespondent Situations 1/ in Aggregation Model Two, Limestone Valley Areas, Alabama

| Item | Unit | Quantity |
|---|---|---|
| Open land | acres | 121,024 |
| Plowable land | acres | 109,478 |
| Row cropland | acres | 83,954 |
| Cotton | acres | 14,007 |
| Cotton production | 500 lb. bales | 13,111 |
| Corn | acres | 32,192 |
| Corn production | bushels | 824,115 |
| Small grain | acres | 605 |
| Small grain production | bushels, oats equivalent | 21,175 |
| Hay | acres | 2,026 |
| Hay production | tons | 2,269 |
| Cows | no. | 9,330 |
| Fat calves produced | no. | 5,500 |
| Sows | no. | 8,680 |
| Market hogs produced | no. | 73,440 |

1/ Nonrespondent situations are the commercial Class VI, part-time and semi-retired farms as classified by the U. S. Census of Agriculture.

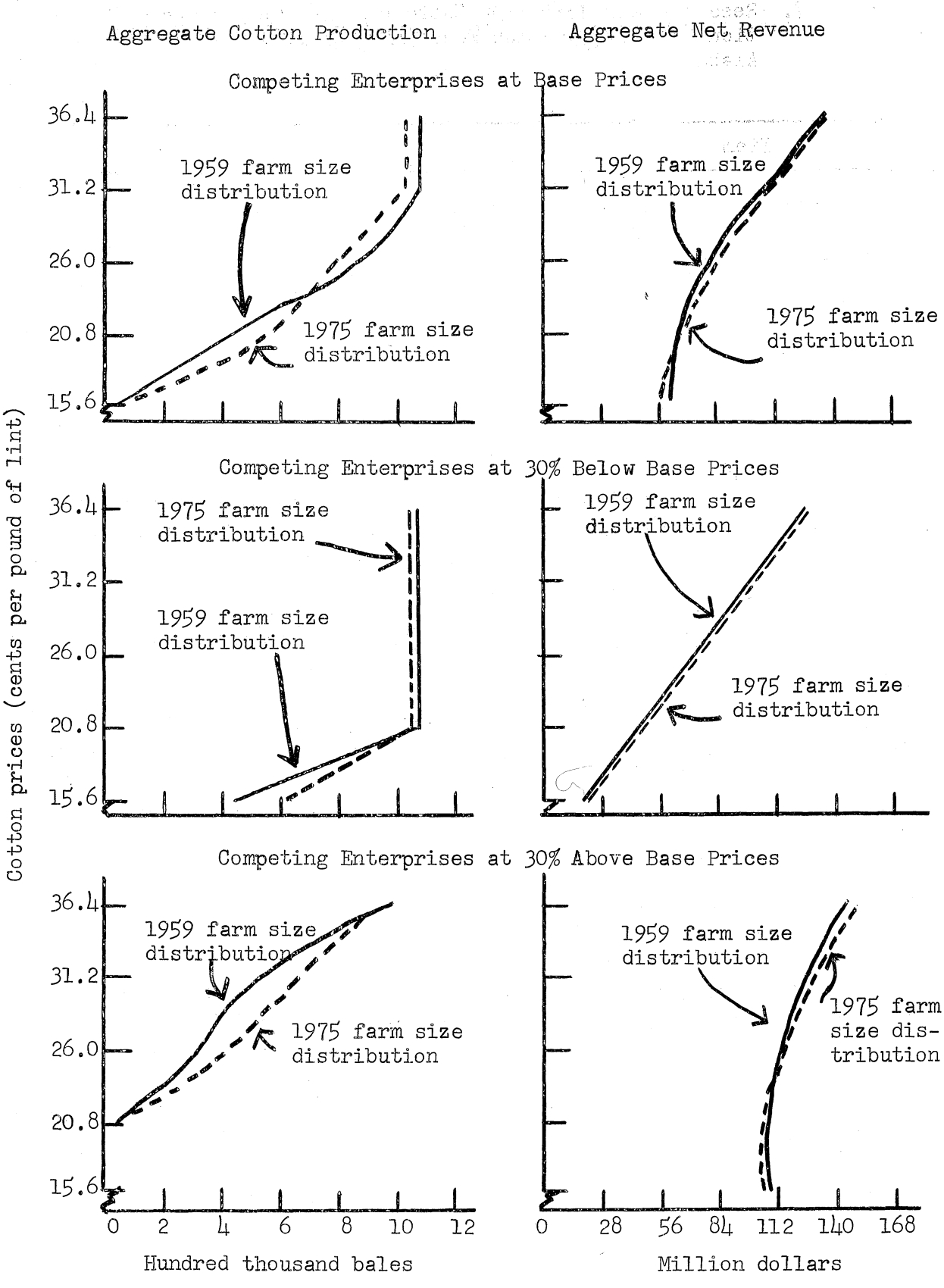


Figure 3. Model II Estimated Cotton Production and Aggregate Net Revenue for a Range of Cotton Prices and Three Prices of Products of Competing Enterprises, Limestone Valley Areas, Alabama

# APPENDIX

Appendix Table 1. - Model 1: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1959 Farm Size Distribution - Varying Prices for Cotton - Base Prices for Other Products)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | **Acreage** | | | |
| Cotton | acres | ------- | 314,734 | 697,082 | 876,830 | 876,830 |
| Corn for grain | acres | 121,364 | 35,495 | 17,825 | ------- | ------- |
| Corn for feed | acres | 695,919 | 604,193 | 264,748 | 78,126 | 78.126 |
| Oats | acres | 198,688 | 267,710 | 239,348 | 248,455 | 248,455 |
| Grain sorghum | acres | 82,080 | 49,680 | 41,040 | 38,880 | 38,880 |
| Alfalfa hay | acres | 44,795 | 5,115 | 19,530 | 64,790 | 64,790 |
| Lespedeza hay | acres | 55,348 | ------- | 56,730 | 68,665 | 68,665 |
| Pasture | acres | 172,764 | 114,972 | 89,410 | 57,576 | 57,576 |
| Idle open land | acres | 165,667 | 144,726 | 110,912 | 103,303 | 103,303 |
| Total open land | acres | 1,536,625 | 1,536,625 | 1,536,625 | 1,536,625 | 1,536,625 |
| | | | **Livestock** | | | |
| Sows | no. | 265,470 | 230,506 | 100,645 | 30,080 | 30,080 |
| Cows | no. | 17,685 | ------- | 17,685 | 17,685 | 17,685 |
| | | | **Resources** | | | |
| Investment capital | dol. | 112,422,617 | 110,559,566 | 100,677,884 | 95,090,647 | 95,090,647 |
| Operating capital | dol. | 32,203,054 | 35,892,847 | 32,454,333 | 30,812,148 | 30,812,148 |
| Resident labor available 1/ | hrs. | 31,954,095 | 31,954,095 | 31,954,095 | 31,954,095 | 31,954,095 |
| Resident labor used | hrs. | 21,064,987 | 21,185,785 | 16,881,814 | 14,445,778 | 14,445,778 |
| Seasonal labor hired | hrs. | 3,072,790 | 3,117,268 | 4,255,998 | 5,069,620 | 5,069,620 |

(Continued)

Appendix Table 1. - Model 1 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | ------- | 433,207 | 949,511 | 1,165,737 | 1,165,737 |
| Corn for grain | bu. | 7,888,660 | 2,307,175 | 1,158,625 | ------- | ------- |
| Corn for feed | bu. | 45,234,735 | 39,272,545 | 17,208,620 | 5,078,190 | 5,078,190 |
| Oats | bu. | 13,908,160 | 18,739,700 | 16,754,360 | 17,391,850 | 17,391,850 |
| Grain sorghum | bu. | 3,693,600 | 2,235,600 | 1,846,800 | 1,749,600 | 1,749,600 |
| Alfalfa hay | tons | 161,262 | 18,414 | 70,308 | 233,244 | 233,244 |
| Lespedeza hay | tons | 99,626 | ------- | 102,114 | 123,597 | 123,597 |
| Market hogs sold | no. | 4,114,785 | 3,572,843 | 1,559,998 | 466,240 | 466,240 |
| Fat calves sold | no. | 13,264 | ------- | 13,264 | 13,264 | 13.264 |
| Net return to operator labor, management, and land | dol. | 60,830,615 | 66,552,560 | 81,759,839 | 110,600,040 | 140,909,291 |
| Return to land 2/ | dol. | 15,366,250 | 15,366,250 | 15,366,250 | 15,366,250 | 15,366,250 |
| Net return to operator labor and management | dol. | 45,464,365 | 51,186,310 | 66,393,589 | 95,233,790 | 125,543,041 |

1/ Includes 10,800 part-time operators, 7,825 full-time operators, and 1,310 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 2. - Model 1: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1959 Farm Size Distribution - Varying Prices for Cotton - Prices for Other Products 30 Per Cent Below Base)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Acreage | | | |
| Cotton | acres | 329,490 | 875,590 | 876,830 | 876,830 | 876,830 |
| Corn for grain | acres | 40,765 | 7,285 | ------- | ------- | ------- |
| Corn for feed | acres | 590,063 | 78,126 | 78,126 | 78,126 | 78,126 |
| Alfalfa hay | acres | ------- | 58,745 | 64,790 | 64,790 | 64,790 |
| Pasture | acres | 112,332 | 15,008 | 15,008 | 15,008 | 15,008 |
| Idle open land | acres | 463,975 | 501,871 | 501,871 | 501,871 | 501,871 |
| Total open land | acres | 1,536,625 | 1,536,625 | 1,536,625 | 1,536,625 | 1,536,625 |
| | | | Livestock | | | |
| Sows | no. | 225,226 | 30,080 | 30,080 | 30,080 | 30,080 |
| | | | Resources | | | |
| Investment capital | dol. | 108,815,548 | 87,277,129 | 87,446,482 | 87,446,482 | 87,466,482 |
| Operating capital | dol. | 30,459,380 | 25,141,586 | 25,160,713 | 25,160,713 | 25,160,713 |
| Resident labor available 1/ | hrs. | 31,954,095 | 31,954,095 | 31,954,095 | 31,954,095 | 31,954,095 |
| Resident labor used | hrs. | 20,029,340 | 12,794,682 | 12,819,017 | 12,819,017 | 12,819,017 |
| Seasonal labor hired | hrs. | 2,660,966 | 4,253,279 | 4,339,924 | 4,339,924 | 4,339,924 |

(Continued)

Appendix Table 2. - Model 1 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | 453,938 | 1,164,316 | 1,165,736 | 1,165,736 | 1,165,736 |
| Corn for grain | bu. | 2,649,725 | 473,525 | ------- | ------- | ------- |
| Corn for feed | bu. | 38,354,095 | 5,078,190 | 5,078,190 | 5,078,190 | 5,078,190 |
| Alfalfa hay | tons | ------- | 211,482 | 233,244 | 233,244 | 233,244 |
| Market hogs sold | no. | 3,491,003 | 466,240 | 466,240 | 466,240 | 466,240 |
| Net return to operator labor, management, and land | dol. | 17,061,767 | 40,604,352 | 70,898,807 | 101,208,058 | 131,517,510 |
| Return to land 2/ | dol. | 15,366,250 | 15,366,250 | 15,366,250 | 15,366,250 | 15,366,250 |
| Net return to operator labor and management | dol. | 1,695,517 | 25,238,102 | 55,532,557 | 85,841,808 | 116,151,260 |

1/ Includes 10,800 part-time operators, 7,825 full-time operators, and 1,310 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 3. - Model 1: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1959 Farm Size Distribution - Varying Prices for Cotton - Prices for Other Products 30 Per Cent Above Base)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | **Acreage** | | | |
| Cotton | acres | ------- | ------- | 230,810 | 399,991 | 804,765 |
| Corn for grain | acres | 126,944 | 126,944 | 79,866 | 24,180 | ------- |
| Corn for feed | acres | 689,269 | 689,269 | 642,242 | 533,655 | 155,091 |
| Oats | acres | 259,478 | 259,478 | 264,036 | 213,760 | 244,521 |
| Grain sorghum | acres | 86,400 | 86,400 | 49,680 | 45,360 | 38,880 |
| Alfalfa hay | acres | 43,090 | 43,090 | 3,100 | 11,625 | 52,700 |
| Lespedeza hay | acres | 55,348 | 55,348 | ------- | 58,280 | 65,410 |
| Pasture | acres | 200,984 | 200,984 | 161,859 | 141,187 | 69,144 |
| Idle open land | acres | 75,112 | 75,112 | 105,032 | 108,587 | 106,114 |
| Total open land | acres | 1,536,625 | 1,536,625 | 1,536,625 | 1,536,625 | 1,536,625 |
| | | | **Livestock** | | | |
| Sows | no. | 262,070 | 262,070 | 244,960 | 203,264 | 58,836 |
| Cows | no. | 31,635 | 31,635 | 17,685 | 17,685 | 17,685 |
| | | | **Resources** | | | |
| Investment capital | dol. | 115,677,981 | 115,677,981 | 114,925,012 | 113,742,309 | 98,138,317 |
| Operating capital | dol. | 32,585,144 | 32,585,144 | 35,551,278 | 34,959,168 | 31,731,271 |
| Resident labor available 1/ | hrs. | 31,954,095 | 31,954,095 | 31,954,095 | 31,954,095 | 31,954,095 |
| Resident labor used | hrs. | 21,267,287 | 21,267,287 | 21,569,668 | 20,571,437 | 15,494,196 |
| Seasonal labor hired | hrs. | 3,187,030 | 3,187,030 | 2,983,442 | 3,558,330 | 4,768,162 |

(Continued)

Appendix Table 3. - Model 1 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | ------- | ------- | 323,297 | 549,815 | 1,079,280 |
| Corn for grain | bu. | 8,251,360 | 8,251,360 | 5,191,290 | 1,571,700 | ------- |
| Corn for feed | bu. | 44,802,485 | 44,802,485 | 41,745,730 | 34,687,640 | 10,081,110 |
| Oats | bu. | 18,163,460 | 18,163,460 | 18,482,520 | 14,963,200 | 17,116,470 |
| Grain sorghum | bu. | 3,892,860 | 3,892,860 | 2,235,600 | 2,221,200 | 1,727,100 |
| Alfalfa hay | tons | 155,124 | 155,124 | 11,160 | 41,850 | 189,720 |
| Lespedeza hay | tons | 99,626 | 99,626 | ------- | 104,904 | 117,738 |
| Market hogs sold | no. | 4,062,085 | 4,062,085 | 3,796,880 | 3,150,592 | 911,958 |
| Calves sold | no. | 23,726 | 23,726 | 13,264 | 13,264 | 13,264 |
| Net return to operator labor, management, and land | dol. | 111,469,176 | 111,469,176 | 118,306,561 | 130,053,487 | 152,850,458 |
| Return to land 2/ | dol. | 15,366,250 | 15,366,250 | 15,366,250 | 15,366,250 | 15,366,250 |
| Net return to operator labor and management | dol. | 96,102,926 | 96,102,926 | 102,940,311 | 114,687,237 | 137,484,208 |

1/ Includes 10,800 part-time operators, 7,825 full-time operators, and 1,310 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 4. - Model 1: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1975 Farm Size Distribution - Varying Prices for Cotton - Base Prices for Other Products)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Acreage | | | |
| Cotton | acre | ------- | 414,336 | 640,652 | 846,788 | 846,788 |
| Corn for grain | acre | 185,113 | 65,494 | 32,890 | ------- | ------- |
| Corn for feed | acre | 611,252 | 494,208 | 297,266 | 64,462 | 64,462 |
| Oats | acre | 227,178 | 276,063 | 183,166 | 189,936 | 189,936 |
| Grain sorghum | acre | 51,300 | 31,050 | 25,650 | 24,300 | 24,300 |
| Alfalfa hay | acre | 82,654 | 9,438 | 36,036 | 119,548 | 119,548 |
| Lespedeza hay | acre | 72,248 | ------- | 104,676 | 126,698 | 126,698 |
| Pasture | acre | 168,770 | 94,198 | 108,050 | 65,256 | 65,256 |
| Idle open land | acre | 131,012 | 144,738 | 101,139 | 92,537 | 92,537 |
| Total open land | acre | 1,529,525 | 1,529,525 | 1,529,525 | 1,529,525 | 1,529,525 |
| | | | Livestock | | | |
| Sows | no. | 233,167 | 188,606 | 113,320 | 24,674 | 24,674 |
| Cows | no. | 23,085 | ------- | 23,085 | 23,085 | 23,085 |
| | | | Resources | | | |
| Investment capital | dol. | 105,102,034 | 103,181,089 | 103,068,676 | 97,783,598 | 97,783,598 |
| Operating capital | dol. | 30,739,527 | 34,906,123 | 32,381,955 | 30,195,839 | 30,195,839 |
| Resident labor available 1/ | hrs. | 25,156,350 | 25,156,350 | 25,156,350 | 25,156,350 | 25,156,350 |
| Resident labor used | hrs. | 19,042,116 | 19,142,034 | 17,001,323 | 14,040,790 | 14,040,790 |
| Seasonal labor hired | hrs. | 3,737,894 | 3,614,912 | 4,625,814 | 5,847,791 | 5,847,791 |

(Continued)

Appendix Table 4. - Model 1 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | ------- | 570,241 | 875,538 | 1,130,568 | 1,130,568 |
| Corn for grain | bu. | 12,032,345 | 4,257,110 | 2,137,850 | ------- | ------- |
| Corn for feed | bu. | 39,731,380 | 32,123,520 | 19,322,290 | 4,190,030 | 4,190,030 |
| Oats | bu. | 15,902,460 | 19,324,410 | 12,821,620 | 13,295,520 | 13,295,520 |
| Grain sorghum | bu. | 2,308,500 | 1,397,250 | 1,154,250 | 1,093,500 | 1,093,500 |
| Alfalfa hay | tons | 297,554 | 33,977 | 129,730 | 430,373 | 430,373 |
| Lespedeza hay | tons | 130,046 | ------- | 188,417 | 228,056 | 228,056 |
| Market hogs sold | no. | 3,614,088 | 2,923,393 | 1,756,460 | 382,447 | 382,447 |
| Calves sold | no. | 17,314 | ------- | 17,314 | 17,314 | 17,314 |
| Net return to operator labor, management, and land | dol. | 58,033,429 | 65,839,699 | 83,627,582 | 111,763,216 | 141,158,027 |
| Return to land 2/ | dol. | 15,295,250 | 15,295,250 | 15,295,250 | 15,295,250 | 15,295,250 |
| Net return to operator labor and management | dol. | 42,738,179 | 50,544,449 | 68,332,332 | 96,467,966 | 125,862,777 |

1/ Includes 6,750 part-time operators, 5,840 full-time operators, and 1,710 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 5. - Model 1: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1975 Farm Size Distribution - Varying Prices for Cotton - Prices for Other Products 30 Per Cent Below Base)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Acreage | | | |
| Cotton | acre | 449,468 | 844,500 | 846,788 | 846,788 | 846,788 |
| Corn for grain | acre | 75,218 | 13,442 | ------- | ------- | ------- |
| Corn for feed | acre | 461,547 | 64,462 | 64,462 | 64,462 | 64,462 |
| Alfalfa hay | acre | ------- | 108,394 | 119,548 | 119,548 | 119,548 |
| Pasture | acre | 88,008 | 12,295 | 12,295 | 12,295 | 12,295 |
| Idle open land | acre | 455,283 | 486,432 | 486,432 | 486,432 | 486,432 |
| Total open land | acre | 1,529,525 | 1,529,525 | 1,529,525 | 1,529,525 | 1,529,525 |
| | | | Livestock | | | |
| Sows | no. | 176,228 | 24,674 | 24,674 | 24,674 | 24,674 |
| | | | Resources | | | |
| Investment capital | dol. | 99,712,717 | 86,299,334 | 86,611,817 | 86,611,817 | 86,611,817 |
| Operating captial | dol. | 29,432,069 | 25,220,333 | 25,255,626 | 25,255,626 | 25,255,626 |
| Resident labor available 1/ | hrs. | 25,156,350 | 25,156,350 | 25,156,350 | 25,156,350 | 25,156,350 |
| Resident labor used | hrs. | 17,944,514 | 12,351,015 | 12,395,917 | 12,395,917 | 12,395,917 |
| Seasonal labor hired | hrs. | 3,150,979 | 4,781,308 | 4,941,182 | 4,941,182 | 4,941,182 |

(Continued)

Appendix Table 5. - Model 1 (Continued)

| Item | Unit | Cotton prices (Cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | 619,351 | 1,127,936 | 1,130,568 | 1,130,568 | 1,130,568 |
| Corn for grain | bu. | 4,889,170 | 873,730 | ------- | ------- | ------- |
| Corn for feed | bu. | 30,000,555 | 4,190,030 | 4,190,030 | 4,190,030 | 4,190,030 |
| Alfalfa hay | tons | ------- | 390,218 | 430,373 | 430,373 | 430,373 |
| Market hogs sold | no. | 2,731,534 | 382,447 | 382,447 | 382,447 | 382,447 |
| Net return to operator labor, management, and land | dol. | 18,192,616 | 42,665,833 | 713,031,472 | 101,428,283 | 130,823,466 |
| Return to land 2/ | dol. | 15,295,250 | 15,295,250 | 15,295,250 | 15,295,250 | 15,295,250 |
| Net return to operator labor and management | dol. | 2,897,366 | 27,370,583 | 560,078,972 | 86,133,033 | 115,528,216 |

1/ Includes 6,750 part-time operators, 5,840 full-time operators, and 1,710 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 6. - Model 1: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1975 Farm Size Distribution - Varying Prices for Cotton - Prices for Other Products 30 Per Cent Above Base)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Acreage | | | |
| Cotton | acres | ------- | ------- | 301,523 | 500,899 | 782,246 |
| Corn for grain | acres | 195,409 | 195,409 | 125,338 | 44,616 | ------- |
| Corn for feed | acres | 602,934 | 602,934 | 546,134 | 424,979 | 143,818 |
| Oats | acres | 265,550 | 265,550 | 271,016 | 171,890 | 188,448 |
| Grain sorghum | acres | 54,000 | 54,000 | 31,050 | 28,350 | 24,300 |
| Alfalfa hay | acres | 79,508 | 79,508 | 5,720 | 21,450 | 97,240 |
| Lespedeza hay | acres | 72,248 | 72,248 | ------- | 107,536 | 120,692 |
| Pasture | acres | 223,476 | 223,476 | 155,819 | 132,956 | 79,181 |
| Idle open land | acres | 36,400 | 36,400 | 92,925 | 96,849 | 93,600 |
| Total open land | acres | 1,529,525 | 1,529,525 | 1,529,525 | 1,529,525 | 1,529,525 |
| | | | Livestock | | | |
| Sows | no. | 229,528 | 229,528 | 208,310 | 162,042 | 54,649 |
| Cows | no. | 48,825 | 48,825 | 23,085 | 23,085 | 23,085 |
| | | | Resources | | | |
| Investment capital | dol. | 111,408,895 | 111,408,895 | 108,822,825 | 108,723,787 | 100,084,796 |
| Operating capital | dol. | 30,184,223 | 30,184,223 | 34,459,254 | 33,687,908 | 31,249,024 |
| Resident labor available 1/ | hrs. | 25,156,350 | 25,156,350 | 25,156,350 | 25,156,350 | 25,156,350 |
| Resident labor used | hrs. | 19,217,726 | 19,217,726 | 19,659,534 | 18,726,191 | 15,100,514 |
| Seasonal labor hired | hrs. | 3,868,300 | 3,868,300 | 3,424,660 | 4,229,904 | 5,053,606 |

(Continued)

Appendix Table 6. - Model 1 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | ------- | ------- | 422,090 | 688,029 | 1,049,736 |
| Corn for grain | bu. | 12,701,585 | 12,701,585 | 8,146,970 | 2,900,040 | ------- |
| Corn for feed | bu. | 39,190,710 | 39,190,710 | 35,498,710 | 27,623,635 | 9,348,170 |
| Oats | bu. | 18,588,500 | 18,588,500 | 18,971,120 | 12,032,300 | 13,191,360 |
| Grain sorghum | bu. | 2,430,000 | 2,430,000 | 1,397,250 | 1,275,750 | 1,093,500 |
| Alfalfa hay | tons | 286,229 | 286,229 | 20,592 | 77,220 | 350,064 |
| Lespedeza hay | tons | 130,046 | 130,046 | ------- | 193,565 | 217,246 |
| Market hogs sold | no. | 3,557,684 | 3,557,684 | 3,228,805 | 2,511,651 | 847,060 |
| Calves sold | no. | 36,619 | 36,619 | 17,314 | 17,314 | 17,314 |
| Net return to operator labor, management, and land | dol. | 106,764,902 | 106,764,902 | 115,661,878 | 131,150,926 | 153,634,133 |
| Return to land 2/ | dol. | 15,295,250 | 15,295,250 | 15,295,250 | 15,295,250 | 15,295,250 |
| Net return to operator labor and management | dol. | 91,469,652 | 91,469,652 | 100,366,628 | 115,855,676 | 138,338,883 |

1/ Includes 6,750 part-time operators, 5,840 full-time operators, and 1,710 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 7. - Model 2: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1959 Farm Size Distribution - Varying Prices for Cotton - Base Prices for Other Products)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | **Acreage** | | | |
| Cotton | acre | ------- | 299,444 | 637,760 | 806,393 | 806,393 |
| Corn for grain | acre | 121,364 | 35,495 | 17,825 | ------- | ------- |
| Corn for feed | acre | 643,019 | 555,711 | 254,343 | 77,032 | 77,032 |
| Oats | acre | 196,849 | 246,503 | 214,565 | 222,886 | 222,886 |
| Grain sorghum | acre | 56,255 | 34,049 | 28,128 | 26,647 | 26,647 |
| Alfalfa hay | acre | 44,795 | 5,115 | 19,530 | 64,790 | 64,790 |
| Lespedeza hay | acre | 55,348 | ------- | 56,730 | 68,665 | 68,665 |
| Pasture | acre | 162,470 | 105,699 | 87,625 | 57,287 | 57,287 |
| Idle open land | acre | 135,629 | 133,715 | 99,223 | 92,029 | 92,029 |
| Total open land | acre | 1,415,729 | 1,415,729 | 1,415,729 | 1,415,729 | 1,415,729 |
| | | | **Livestock** | | | |
| Sows | no. | 245,207 | 211,942 | 96,736 | 28,655 | 28,655 |
| Cows | no. | 17,685 | ------- | 17,685 | 17,685 | 17,685 |
| | | | **Resources** | | | |
| Investment capital | dol. | 100,995,074 | 99,102,461 | 90,736,109 | 85,524,775 | 85,524,775 |
| Operating capital | dol. | 30,047,289 | 33,271,080 | 30,162,392 | 28,599,987 | 28,599,987 |
| Resident labor available 1/ | hrs. | 29,568,663 | 29,568,663 | 29,568,663 | 29,568,663 | 29,568,663 |
| Resident labor used | hrs. | 19,417,452 | 19,456,359 | 15,652,822 | 13,342,670 | 13,342,670 |
| Seasonal labor hired | hrs. | 2,942,416 | 2,928,547 | 3,970,969 | 4,760,417 | 4,760,417 |

(Continued)

Appendix Table 7. - Model 2 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | ------- | 411,711 | 868,879 | 1,072,439 | 1,072,439 |
| Corn for grain | bu. | 7,888,660 | 2,307,175 | 1,158,625 | ------- | ------- |
| Corn for feed | bu. | 41,796,235 | 36,121,215 | 16,532,295 | 5,007,080 | 5,007,080 |
| Oats | bu. | 13,779,430 | 17,255,210 | 15,019,550 | 15,602,020 | 15,602,020 |
| Grain sorghum | bu. | 2,531,475 | 1,532,205 | 1,265,760 | 1,199,115 | 1,199,115 |
| Alfalfa hay | ton | 161,262 | 18,414 | 70,308 | 233,244 | 233,244 |
| Lespedeza hay | ton | 99,626 | ------- | 102,114 | 123,597 | 123,597 |
| Market hogs sold | no. | 3,800,709 | 3,285,101 | 1,499,408 | 444,152 | 444,152 |
| Calves sold | no. | 13,264 | ------- | 13,264 | 13,264 | 13,264 |
| Net return to operator labor, management, and land | dol. | 56,592,048 | 62,026,590 | 76,230,995 | 102,763,681 | 130,647,035 |
| Net return to land 2/ | dol. | 14,157,290 | 14,157,290 | 14,157,290 | 14,157,290 | 14,157,290 |
| Net return to operator labor and management | dol. | 42,434,758 | 47,869,300 | 62,073,705 | 88,606,391 | 116,489,745 |

1/ Includes 7,402 part-time operators, 7,673 full-time operators, and 1,310 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 8. - Model 2: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1959 Farm Size Distribution - Varying Prices for Cotton - Prices for Other Products 30 Per Cent Below Base)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Acreage | | | |
| Cotton | acre | 316,237 | 805,152 | 806,392 | 806,392 | 806,392 |
| Corn for grain | acre | 40,765 | 7,285 | ------- | ------- | ------- |
| Corn for feed | acre | 539,882 | 77,032 | 77,032 | 77,032 | 77,032 |
| Alfalfa hay | acre | ------- | 58,745 | 64,790 | 64,790 | 64,790 |
| Pasture | acre | 102,718 | 14,795 | 14,795 | 14,795 | 14,795 |
| Idle open land | acre | 416,127 | 452,720 | 452,720 | 452,720 | 452,720 |
| Total open land | acre | 1,415,729 | 1,415,729 | 1,415,729 | 1,415,729 | 1,415,729 |
| | | | Livestock | | | |
| Sows | no. | 205,982 | 29,655 | 29,655 | 29,655 | 29,655 |
| | | | Resources | | | |
| Investment capital | dol. | 97,293,881 | 77,711,257 | 77,880,610 | 77,880,610 | 77,880,610 |
| Operating capital | dol. | 28,358,391 | 23,521,662 | 23,540,789 | 23,540,789 | 23,540,789 |
| Resident labor available 1/ | hrs. | 29,568,663 | 29,568,663 | 29,568,663 | 29,568,663 | 29,568,663 |
| Resident labor used | hrs. | 18,460,415 | 11,872,242 | 11,896,577 | 11,896,577 | 11,896,577 |
| Seasonal labor hired | hrs. | 2,524,556 | 3,991,975 | 4,078,620 | 4,078,620 | 4,078,620 |

(Continued)

Appendix Table 8. - Model 2 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | 435,242 | 1,071,013 | 1,072,439 | 1,072,439 | 1,072,439 |
| Corn for grain | bu. | 2,649,725 | 473,525 | ------- | ------- | ------- |
| Corn for feed | bu. | 35,092,330 | 5,007,080 | 5,007,080 | 5,007,080 | 5,007,080 |
| Alfalfa hay | ton | ------- | 211,482 | 233,244 | 233,244 | 233,244 |
| Market hogs sold | no. | 3,192,721 | 459,652 | 459,652 | 459,652 | 459,652 |
| Net return to operator labor, management, and land | dol. | 16,123,174 | 37,925,508 | 65,794,100 | 93,677,454 | 121,561,010 |
| Net return to land 2/ | dol. | 14,157,290 | 14,157,290 | 14,157,290 | 14,157,290 | 14,157,290 |
| Net return to operator labor and management | dol. | 1,965,884 | 23,768,218 | 51,636,810 | 79,520,164 | 107,403,720 |

1/ Includes 7,402 part-time operators, 7,673 full-time operators, and 1,310 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 9. - Model 2: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1959 Farm Size Distribution - Varying Prices for Cotton - Prices for Other Products 30 Per Cent Above Base)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Acreage | | | |
| Cotton | acre | ------- | ------- | 215,519 | 368,390 | 735,588 |
| Corn for grain | acre | 126,944 | 126,944 | 79,866 | 24,180 | ------- |
| Corn for feed | acre | 637,389 | 637,389 | 593,759 | 499,105 | 152,844 |
| Oats | acre | 238,610 | 238,610 | 242,828 | 191,533 | 219,059 |
| Grain sorghum | acre | 59,216 | 59,216 | 34,049 | 31,088 | 26,647 |
| Alfalfa hay | acre | 43,090 | 43,090 | 3,100 | 11,625 | 52,700 |
| Lespedeza hay | acre | 55,348 | 55,348 | ------- | 58,280 | 65,410 |
| Pasture | acre | 191,370 | 191,370 | 152,584 | 134,630 | 68,718 |
| Idle open land | acre | 63,762 | 63,762 | 94,024 | 96,898 | 94,763 |
| Total open land | acre | 1,415,729 | 1,415,729 | 1,415,729 | 1,415,729 | 1,415,729 |
| | | | Livestock | | | |
| Sows | no. | 242,486 | 242,486 | 226,395 | 190,136 | 57,985 |
| Cows | no. | 31,635 | 31,635 | 17,685 | 17,685 | 17,685 |
| | | | Resources | | | |
| Investment capital | dol. | 104,327,845 | 104,327,845 | 103,467,907 | 102,809,141 | 88,511,197 |
| Operating capital | dol. | 30,104,530 | 30,104,530 | 32,929,511 | 32,464,418 | 29,508,149 |
| Resident labor available 1/ | hrs. | 29,568,663 | 29,568,633 | 29,568,633 | 29,568,633 | 29,568,633 |
| Resident labor used | hrs. | 19,568,782 | 19,568,782 | 19,840,242 | 19,023,463 | 14,374,960 |
| Seasonal labor hired | hrs. | 3,030,929 | 3,030,929 | 2,794,720 | 3,333,590 | 4,461,725 |

(Continued)

Appendix Table 9. - Model 2 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | ------- | ------- | 301,801 | 505,573 | 987,428 |
| Corn for grain | bu. | 8,251,360 | 8,251,360 | 5,191,290 | 1,571,700 | ------- |
| Corn for feed | bu. | 41,430,285 | 41,430,285 | 38,594,335 | 32,441,825 | 9,934,860 |
| Oats | bu. | 16,702,700 | 16,702,700 | 16,997,960 | 13,407,310 | 15,334,130 |
| Grain sorghum | bu. | 2,664,720 | 2,664,720 | 1,532,205 | 1,398,960 | 1,199,115 |
| Alfalfa hay | tons | 155,124 | 155,124 | 11,160 | 41,850 | 189,720 |
| Lespedeza hay | tons | 99,626 | 99,626 | ------- | 104,904 | 117,738 |
| Market hogs sold | no. | 3,758,533 | 3,758,533 | 3,509,122 | 2,947,108 | 898,768 |
| Calves sold | no. | 23,726 | 23,726 | 13,264 | 13,264 | 13,264 |
| Net return to operator labor, management, and land | dol. | 103,590,219 | 103,590,219 | 109,931,224 | 121,051,695 | 141,954,555 |
| Net return to land 2/ | dol. | 14,157,290 | 14,157,290 | 14,157,290 | 14,157,290 | 14,157,290 |
| Net return to operator labor and management | dol. | 89,432,929 | 89,432,929 | 95,773,934 | 106,894,405 | 127,797,265 |

1/ Includes 7,402 part-time operators, 7,673 full-time operators, and 1,310 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 10. - Model 2: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1975 Farm Size Distribution - Varying Prices for Cotton - Base Prices for Other Products)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Acreage | | | |
| Cotton | acre | ------- | 399,050 | 581,267 | 776,273 | 776,273 |
| Corn for grain | acre | 185,113 | 65,494 | 32,890 | ------- | ------- |
| Corn for feed | acre | 558,264 | 445,637 | 286,834 | 63,354 | 63,354 |
| Oats | acre | 225,314 | 254,837 | 158,358 | 164,342 | 164,342 |
| Grain sorghum | acre | 25,483 | 15,424 | 12,741 | 12,071 | 12,071 |
| Alfalfa hay | acre | 82,654 | 9,438 | 36,036 | 119,548 | 119,548 |
| Lespedeza hay | acre | 72,248 | ------- | 104,676 | 126,698 | 126,698 |
| Pasture | acre | 158,460 | 84,906 | 106,260 | 64,963 | 64,963 |
| Idle open land | acre | 100,965 | 133,715 | 89,439 | 81,252 | 81,252 |
| Total open land | acre | 1,408,501 | 1,408,501 | 1,408,501 | 1,408,501 | 1,408,501 |
| | | | Livestock | | | |
| Sows | no. | 212,870 | 170,008 | 109,400 | 24,243 | 24,243 |
| Cows | no. | 23,085 | ------- | 23,085 | 23,085 | 23,085 |
| | | | Resources | | | |
| Investment capital | dol. | 93,665,774 | 91,715,274 | 93,121,647 | 88,213,185 | 88,213,185 |
| Operating capital | dol. | 28,580,137 | 32,280,869 | 30,044,321 | 27,980,841 | 27,980,841 |
| Resident labor available 1/ | hrs. | 22,765,860 | 22,765,860 | 22,765,860 | 22,765,860 | 22,765,860 |
| Resident labor used | hrs. | 17,392,170 | 17,410,221 | 15,770,825 | 12,936,354 | 12,936,354 |
| Seasonal labor hired | hrs. | 3,602,362 | 3,426,048 | 4,340,495 | 5,538,268 | 5,538,268 |

(Continued)

Appendix Table 10. - Model 2 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | ------- | 548,752 | 794,821 | 1,037,163 | 1,037,163 |
| Corn for grain | bu. | 12,032,345 | 4,257,110 | 2,137,850 | ------- | ------- |
| Corn for feed | bu. | 36,287,160 | 28,966,405 | 18,644,210 | 4,118,010 | 4,118,010 |
| Oats | bu. | 15,771,980 | 17,838,590 | 11,085,060 | 11,503,940 | 11,503,940 |
| Grain sorghum | bu. | 1,146,735 | 694,080 | 573,345 | 543,195 | 543,195 |
| Alfalfa hay | ton | 297,554 | 33,977 | 129,730 | 430,373 | 430,373 |
| Lespedeza hay | ton | 130,046 | ------- | 188,417 | 228,056 | 228,056 |
| Market hogs sold | no. | 3,299,485 | 2,635,124 | 1,695,700 | 375,766 | 375,766 |
| Calves sold | no. | 17,314 | ------- | 17,314 | 17,314 | 17,314 |
| Net return to operator labor, management, and land | dol. | 53,788,022 | 61,306,973 | 78,091,624 | 103,917,316 | 130,883,598 |
| Net return to land 2/ | dol. | 14,085,010 | 14,085,010 | 14,085,010 | 14,085,010 | 14,085,010 |
| Net return to operator labor and management | dol. | 39,703,012 | 47,221,963 | 64,006,614 | 89,832,306 | 116,798,588 |

1/ Includes 3,353 part-time operators, and 5,686 full-time operators, and 1,710 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 11. - Model 2: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1975 Farm Size Distribution - Varying Prices for Cotton - Prices for Other Products 30 Per Cent Below Base)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Acreage | | | |
| Cotton | acre | 436,220 | 773,985 | 776,273 | 776,273 | 776,273 |
| Corn for grain | acre | 75,218 | 13,442 | ------- | ------- | ------- |
| Corn for feed | acre | 411,277 | 63,354 | 63,354 | 63,354 | 63,354 |
| Alfalfa hay | acre | ------- | 108,394 | 119,548 | 119,548 | 119,548 |
| Pasture | acre | 78,377 | 12,079 | 12,079 | 12,079 | 12,079 |
| Idle open land | acre | 407,409 | 437,247 | 437,247 | 437,247 | 437,247 |
| Total open land | acre | 1,408,501 | 1,408,501 | 1,408,501 | 1,408,501 | 1,408,501 |
| | | | Livestock | | | |
| Sows | no. | 156,951 | 24,243 | 24,243 | 24,243 | 24,243 |
| | | | Resources | | | |
| Investment capital | dol. | 88,182,360 | 76,728,921 | 77,041,405 | 77,041,405 | 77,041,405 |
| Operating capital | dol. | 27,327,913 | 23,598,028 | 23,633,321 | 23,633,321 | 23,633,321 |
| Resident labor available 1/ | hrs. | 22,765,860 | 22,765,860 | 22,765,860 | 22,765,860 | 22,765,860 |
| Resident labor used | hrs. | 16,373,238 | 11,427,308 | 11,472,210 | 11,472,210 | 11,472,210 |
| Seasonal labor hired | hrs. | 3,014,438 | 4,519,706 | 4,679,580 | 4,679,580 | 4,679,580 |

(Continued)

Appendix Table 11. - Model 2 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | Production | | | | |
| Cotton | bales | 600,661 | 1,034,532 | 1,037,163 | 1,037,163 | 1,037,163 |
| Corn for grain | bu. | 4,889,170 | 873,730 | ------- | ------- | ------- |
| Corn for feed | bu. | 26,733,005 | 4,118,010 | 4,118,010 | 4,118,010 | 4,118,010 |
| Alfalfa hay | ton | ------- | 390,218 | 430,373 | 430,373 | 430,373 |
| Market hogs sold | no. | 2,432,740 | 375,766 | 375,766 | 375,766 | 375,766 |
| Net return to operator labor, management, and land | dol. | 17,252,319 | 39,983,679 | 66,922,822 | 93,889,104 | 120,855,757 |
| Net return to land 2/ | dol. | 14,085,010 | 14,085,010 | 14,085,010 | 14,085,010 | 14,085,010 |
| Net return to operator labor and management | dol. | 3,167,309 | 25,898,669 | 52,837,812 | 79,804,094 | 106,770,747 |

1/ Includes 3,353 part-time operators, and 5,686 full-time operators, and 1,710 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.

Appendix Table 12. - Model 2: Aggregates for Specified Items, Limestone Valley Areas, Alabama

(Advanced Technology - 1975 Farm Size Distribution - Varying Prices for Cotton - Prices for Other Products 30 Per Cent Above Base)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Acreage | | | |
| Cotton | acre | ------- | ------- | 286,236 | 469,307 | 713,010 |
| Corn for grain | acre | 195,409 | 195,409 | 125,338 | 44,616 | ------- |
| Corn for feed | acre | 550,966 | 550,966 | 497,562 | 390,335 | 141,539 |
| Oats | acre | 244,663 | 244,663 | 249,789 | 149,645 | 162,962 |
| Grain sorghum | acre | 26,824 | 26,824 | 15,424 | 14,083 | 12,071 |
| Alfalfa hay | acre | 79,508 | 79,508 | 5,720 | 21,450 | 97,240 |
| Lespedeza hay | acre | 72,248 | 72,248 | ------- | 107,536 | 120,692 |
| Pasture | acre | 213,845 | 213,845 | 146,528 | 126,382 | 78,749 |
| Idle open land | acre | 25,038 | 25,038 | 81,904 | 85,147 | 82,238 |
| Total open land | acre | 1,408,501 | 1,408,501 | 1,408,501 | 1,408,501 | 1,408,501 |
| | | | Livestock | | | |
| Sows | no. | 209,911 | 209,911 | 189,712 | 158,878 | 53,786 |
| Cows | no. | 48,825 | 48,825 | 23,085 | 23,085 | 23,085 |
| | | | Resources | | | |
| Investment capital | dol. | 100,050,018 | 100,050,018 | 97,357,010 | 97,781,756 | 90,452,329 |
| Operating capital | dol. | 27,700,080 | 27,700,080 | 31,834,000 | 31,189,634 | 29,022,930 |
| Resident labor available 1/ | hrs. | 22,765,860 | 22,765,860 | 22,765,860 | 22,765,860 | 22,765,860 |
| Resident labor used | hrs. | 17,516,825 | 17,516,825 | 17,927,721 | 17,175,777 | 13,979,739 |
| Seasonal labor hired | hrs. | 3,712,047 | 3,712,047 | 3,235,796 | 4,005,031 | 5,134,885 |

(Continued)

Appendix Table 12. - Model 2 (Continued)

| Item | Unit | Cotton prices (cents per pound of lint) | | | | |
|---|---|---|---|---|---|---|
| | | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 |
| | | | Production | | | |
| Cotton | bales | ------- | ------- | 400,601 | 643,800 | 957,802 |
| Corn for grain | bu. | 12,701,585 | 12,701,585 | 8,146,970 | 2,900,040 | ------- |
| Corn for feed | bu. | 35,812,790 | 35,812,790 | 32,341,530 | 25,371,775 | 9,200,035 |
| Oats | bu. | 17,126,410 | 17,126,410 | 17,485,230 | 10,475,150 | 11,407,340 |
| Grain sorghum | bu. | 1,207,080 | 1,207,080 | 694,080 | 633,735 | 543,195 |
| Alfalfa hay | ton | 286,229 | 286,229 | 20,592 | 77,220 | 350,064 |
| Lespedeza hay | ton | 130,046 | 130,046 | ------- | 193,565 | 217,246 |
| Market hogs sold | no. | 3,253,620 | 3,253,620 | 2,940,536 | 2,462,609 | 833,683 |
| Calves sold | no. | 36,619 | 36,619 | 17,314 | 17,314 | 17,314 |
| Net return to operator labor, management, and land | dol. | 98,873,893 | 98,873,893 | 107,274,635 | 122,137,413 | 142,764,841 |
| Net return to land 2/ | dol. | 14,085,010 | 14,085,010 | 14,085,010 | 14,085,010 | 14,085,010 |
| Net return to operator labor and management | dol. | 84,788,883 | 84,788,883 | 93,189,625 | 108,052,403 | 128,679,831 |

1/ Includes 3,353 part-time operators, and 5,686 full-time operators, and 1,710 full-time hired men.

2/ Openland valued at $200 per acre. Return to land is 5% per year or $10 per acre per year.