

# AGRICULTURAL EXPERIMENT STATION of The Alabama Polytechnic Institute, Auburn, Ala.

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## SUMMARY of RESULTS of BEEF CATTLE-COTTON-HOG UNIT Tennessee Valley Substation, Belle Mina, Alabama 1949 and 1950

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A beef cattle, cotton, and hog management unit was established at the Tennessee Valley Substation in 1949. Reported here are results of the first 2 year's operations, 1949 and 1950.

### Experiment and Purpose

Cotton is the major source of agricultural income in the Tennessee Valley. However, the acreage in cotton that can be handled is limited by the shortage of labor and the types of soil. Because of these reasons and acreage controls of the past, land is now available on most farms for which some profitable type of farm enterprise must be developed to supplement the income from cotton.

Experimental results at the Tennessee Valley Substation and at other locations of the Alabama Agricultural Experiment Station System indicate that the production of forage and grain crops, to be marketed through beef cattle and hogs, provides an opportunity for profitably utilizing available land on most farms. These results show: (1) that good grazing for cattle can be produced throughout most of the year, (2) that a farming system providing good grazing for cattle also provides a large quantity of grain as a by-product which can be more efficiently utilized by hogs than cattle, (3) that such systems result in more efficient utilization of labor throughout the year than is afforded by a one-crop system of farming, and (4) that such systems provide better protection of the soil against erosion. For these reasons, a farm-size management unit combining cotton, beef cattle, and hogs as the sources of income has been established and is in operation on the Tennessee Valley Substation.

The purpose of the farm-size experiment is: (1) to study the use of beef cattle and hogs to supplement the income from cotton; (2) to determine the proper balance between land, labor, hogs, beef cattle, and crops for operating the system efficiently; (3) to determine the number and weight of calves that can be raised from a given number of cows, and the best time of the year that they should be dropped for the most economical gains and efficient use of crops; (4) to determine the best time of the year to sell the calves; (5) to determine the best methods of wintering cattle as to feed and shelter under severe weather conditions; and (6) to study the improvement in yields and carrying capacity of the land that results from a livestock program of this kind.

Use of Land. In establishing the unit, 160 acres of land was reserved to be operated as a two-family, farm-size experiment. Because of the nature of the land, one area is used continuously for cotton production. The remaining open land in the unit is used to provide a maximum of forage and grain for livestock. The return from livestock is used to supplement the income from cotton. Methods and practices found to give the most economical results at the Substation were combined into the cropping system. The acreages of crops are as follows:

Cotton .....	18.0
Wheat or oats ... (Double cropped, crimson-ryegrass) .....	15.0
Sericea-crimson clover combination .....	20.0
Crimson clover and ryegrass ... (D. C. Grain sorghum) .....	13.0
Alfalfa .....	10.0
Wheat or oats .... (D. C. Sudan grass) .....	7.0
Crimson clover ... (D. C. grain sorghum) .....	7.0
Fescue .....	4.0
Corn .....	2.0
Ladino clover .....	2.0
Improved pasture .....	16.5
Homestead, barn, and garden areas .....	5.0
Woodland, slough, roadways, etc. ....	40.5
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Total acres in farm .....	160.00

Machinery. The unit owns all farm machinery and equipment necessary for normal operations, except a combine, rake, and hay baler. These are hired at local prevailing prices when needed. The principal farm machinery and equipment owned includes one tractor and the following tractor equipment: trailer, mower, plows, section harrow, cultivator, rotary hoe, and disk.

Buildings. On this unit are two five-room dwellings for the farm operators and their families. Other buildings include a barn, which is used for hay storage and hay feeding during extremely cold or wet weather; machinery shed; poultry house; and three farrowing houses for hogs.

Labor. All regular labor is supplied by the two farm operators. Extra labor for hoeing and picking cotton is hired from outside sources or from the families on the unit. If labor records indicate that less labor is needed after the unit is well established, the regular labor will be reduced to one operator.

Livestock. The unit was started in 1949 with 19 good grade Hereford cows, 5 cows of mixed breeds, and a purebred bull. It now has 29 brood cows and replacement heifers, and a purebred bull. Twenty-five to 30 cows will be maintained as the beef herd.

Four native sows are maintained to supply necessary pigs to use the grain produced on the unit.

One horse is kept for herding cattle and for working the garden and truck patches.

Two milk cows and a small laying flock are kept to supply milk and eggs for the farm operators and their families.

### Management of Crops

Cotton. Cotton is grown continuously on an 18-acre field because the soil is better adapted to cotton than other areas on the unit, which are subject to overflow. An adapted variety, Empire, is usually planted between April 10 and 20. Fertilizer recommendations based on results of experiments at the Substation are closely followed on the unit. Cotton receives an application of 600 pounds of 6-8-4 fertilizer per acre. Cotton was not poisoned in 1949, but in 1950 eight applications were made to control the major cotton insects.

Corn. Two acres of corn of a leading white variety are used for furnishing cornmeal to the farm families and for additional grain for livestock. Corn is planted about May 1 in  $3\frac{1}{2}$ -foot rows, 15 to 18 inches in the drill. The corn receives 300 pounds of 6-8-4 fertilizer per acre before planting and a sidedressing of 400 pounds of nitrate of soda or equal nitrogen from other sources when 30 to 35 days old.

Small Grain, Forage, and Hay Crops. The feed production program of this unit is based on efficient use of grain, hay, and forage crops.

A 2-year rotation of crimson clover and ryegrass followed by grain sorghum interplanted to oats or wheat provides one of the principal sources of feed and forage for cattle and hogs on the unit. The rotation is used on a 15-acre field and 13-acre field. The crops are planted so that one field is growing crimson clover and ryegrass in the winter while the other is growing either oats or wheat. Likewise, in the summer when one field is planted to grain sorghum following crimson clover and ryegrass, the other is fallowed for late July or early August seeding of crimson clover and ryegrass. Oats or wheat is planted in the grain sorghum middles in September. By handling the land in this way, each field produces three crops every 2 years.

The crimson clover and ryegrass furnish grazing from about October 1 to May 1, at which time grazing is stopped and the clover is allowed to mature seed. The seed are combined and sold as a cash crop. Cattle graze the wheat or oats, and grain sorghum stubble during the winter until March 1, when they are removed and the oats or wheat is topdressed with nitrogen. When the grain is mature, it is combined and stored until fed to hogs in a self-feeder.

To supplement grazing during critical periods, a small area (7 acres) is grown in small grain and crimson clover followed by sweet Sudan grass for summer grazing or hay.

A small acreage (4 acres) adjacent to the barn lot is seeded to fescue. This area is used to confine cows when grazing areas overflow with water, and

to bridge the gap between summer and fall grazing.

A 20-acre lespedeza sericea-crimson clover combination is another principal source of forage. The cattle are grazed on the sericea during the summer months and on the crimson clover in the winter.

The unit has approximately 23 acres seeded to white clover-Dallis and orchard grass that is used during the year when moisture is sufficient for adequate growth. Part of this improved pasture is used to furnish grazing for the milk cows and replacement heifers, and the remainder is used for the beef cattle herd.

Alfalfa (10 acres) and Ladino clover (2 acres) are used as year-round grazing to furnish protein for economical production of hogs. The surplus alfalfa is cut for hay and fed to cattle during critical periods, or it is grazed by the cattle.

A 7-acre grain sorghum-crimson clover field adjacent to the hog pasture has been hogged off for the past 2 years.

#### Management of Livestock

Beef cattle and hogs are used as a source of income to supplement the income from cotton. At the beginning of the experiment, 24 cows, predominantly beef type, were bought. One of these has been sold and the remainder has been bred to a purebred bull. From the calves produced, six replacement heifers have been saved. At the beginning all cows were bred to drop calves in the spring of the year. In order to determine the best time for calves to be dropped, several of the cows have been bred to calve in the fall. Cows failing to settle for either spring or fall calving are rebred at the next breeding period. All heifer calves are vaccinated against Bang's and black-leg diseases at 4 to 6 months of age. All bull calves are castrated soon after they are dropped. With the exception of replacement heifers, all calves are sold on open market directly from their dams at the age of 8 to 10 months. At the same time, replacement heifers are separated from their dams.

Woodland areas furnish the main protection for cattle during winter months, but in extreme cold weather the cattle have been confined to the barn and hand fed hay. They are also fed hay in the barn when fields are covered with snow or high water.

Sows of this unit are bred to farrow two litters of pigs per year, one litter in March and the other in September. All hogs are sold on open market. The weight at selling time depends on the feed supply. When feed supplies are unusually large, the hogs are carried to somewhat heavier than top weights. When feed supplies are low, the hogs are sold at lower than top weights. Spring-farrowed pigs are usually fed wheat or oats and finished on grain sorghum. The grain sorghum is either fed in a self-feeder or is hogged off during the fall months. Fall-farrowed pigs are finished on grain sorghum fed in a self-feeder and are sold in the spring. All pigs are weaned and wormed, and boar pigs are castrated at 8 to 10 weeks of age.

All hogs have access to alfalfa and Ladino clover at all times to furnish the required protein. A mineral mixture composed of one part salt and three parts basic slag is kept before the hogs at all times. Plenty of fresh water is provided.

### Results

The first year that the unit was in operation, January 1, to December 31, 1949, total receipts from the sale of cotton and cottonseed, beef cattle, hogs, and seed amounted to \$5,822.72. The net cash balance or return to capital and regular labor after deducting cash expenses of \$2,554.53 amounted to \$3,268.19, excluding inventory changes and capital outlay. Capital outlay and inventory changes were about the same in 1949. However, in 1950, the inventory increase exceeded capital outlay by \$495.

In 1950, total receipts amounted to \$10,422.60, with a net cash return of \$6,162.61 after all cash expenses were paid. Both years, the percentage of the total income from cotton was about the same as that from livestock. In 1949, seed sales accounted for about 16 per cent of the gross income. However, in 1950 they accounted for less than 3 per cent of the gross income.

Cotton yields were 440 pounds of lint per acre in 1949 and 615 pounds in 1950. No poison was used on cotton in 1949, but in 1950 eight applications were made. A total of 2,700 pounds of insecticide was used to control cotton insects.

Corn produced an average of 57 bushels per acre in 1949 and 60 bushels in 1950.

Grain sorghum averaged 35 to 40 bushels per acre each year. In 1950, 315 pounds of poison was used to control worms on grain sorghum. Oats made 40 bushels per acre in 1949, and wheat averaged between 15 and 20 bushels for both years. Weather conditions in spring were against good yields of wheat because of rust.

Summary of Results  
BEEF CATTLE--COTTON--HOG UNIT  
Tennessee Valley Substation, 1949 and 1950

Sales and Receipts

	1949		1950	
Cotton	7,261 lb.	\$2,172.70	11,062 lb.	\$4,540.44
Cottonseed	13,578 lb.	271.58	17,850 lb.	747.63
Bolly Cotton	—	—	375 lb.	39.38
Top Hogs: $\frac{11}{64}$ head $\frac{1}{64}$ head	3,105 lb.	505.32	—	—
	—	—	13,780 lb.	2,440.32
Sows: 2 head	—	—	935 lb.	159.56
Calves: 20 head	8,305 lb.	1,752.70	—	—
16 head	—	—	8,630 lb.	2,172.02
Cows: 1 head	1,095 lb.	210.37	—	—
Seed: Crimson clover	1,184 lb.	483.60	607 lb.	152.25
Oats	251 bu.	220.45	—	—
Wheat	78 bu.	156.00	—	—
Sericea	300 lb.	60.00	—	—
Fescue	—	—	260 lb.	130.00
Miscellaneous: Eggs	—	—	92 doz.	41.00
<b>Total Cash Receipts</b>		<b>\$5,822.72</b>		<b>\$10,422.60</b>

Cash Expenses

	1949		1950	
Feed		\$211.90		\$241.70
Fertilizer		767.62		720.00
Seed		457.40		377.05
Machinery and equipment hire		276.97		452.60
Extra labor		245.00		778.48
Ginning and storage		125.34		176.90
Fuel and oil		160.94		131.75
Cotton and grain sorghum poison		—		358.65
Livestock purchases		30.00 $\frac{2}{}$		558.27
Miscellaneous $\frac{3}{}$		279.36		464.59
<b>Total Cash Expenses</b>		<b>\$2,554.36</b>		<b>\$4,659.99</b>
<b>Net Cash Returns</b>		<b>\$3,268.19</b>		<b>\$6,162.61</b>

$\frac{1}{}$  Only 3 litters sold.

$\frac{2}{}$  Chickens purchased.

$\frac{3}{}$  Includes commission, insurance, taxes, electricity, and applying poison to cotton and grain sorghum.

**BEEF CATTLE-COTTON-HOG  
UNIT**  
Tennessee Valley Substation  
Belle Mina, Alabama



