

Planning and Operating A Pilot Farm on The Ames Plantation In Tennessee

Thomas J. Whatley

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The author of this bulletin takes responsibility for accuracy of the data presented.

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Thomas J. Whatley
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INTRODUCTION

Plans for a Pilot Farm on the Ames Plantation were developed and adopted in late 1954 through joint efforts of Will Trustees of the Hobart Ames Foundation and the University of Tennessee. Operations on this farm were started in 1955.

The primary objective of the Pilot Farm is the development of practical farm-operational plans, through application of research findings, suitable for other farms of similar character and resources. Development of such plans can have far-reaching significance, inasmuch as the land selected for the Pilot Farm is representative of vast areas of the South.

The Ames Plantation is located in Fayette and Hardeman Counties, Tennessee, in the cotton-producing section of the state. Gross cash income averages around \$2,000 per farm in this section, approximately 80 percent of which comes from cotton. Where cotton is the major source of income, usually the total amount of land, labor and machinery on the farm is not fully used. As a result the net income is too low to provide a reasonable level of living for the farm family.

The specific objectives in setting up this Pilot Farm were:

1. To determine adjustments that could be made to increase the **net income** of West Tennessee farmers.
2. To use research information and Extension methods as they apply in individual farm and home planning.
3. To determine the kinds and amount of credit needed in making long range agricultural changes.

A committee composed of members of the Agricultural Economics Department, Agronomy Department, Animal Husbandry Department and Plantation staff assumed the responsibility for

planning this farm. Representatives of other agencies were invited to participate in the planning. The Committee was given the job of selecting an area of land on the 18,450-acre Ames Plantation for this Pilot Farm.

Several factors entered into this selection. First, it seemed desirable to select a tract which was large enough so that the type of farming adopted would not depend on either specialty crops or livestock, and that net farm income produced would be reasonably comparable with that of better farming areas. Second, since a large beef herd was on the Plantation and some of these cattle could be transferred to the Pilot Farm without a cash outlay, it seemed advisable to have beef cattle as the main forage-consuming type of livestock. Third, the farm needed to be accessible to a main road for demonstration purposes. Fourth, it should be a farm where the tenant's lease had expired and he planned to move, or where the tenant could become the operator of the Pilot Farm.

Once the tract was selected for this farm, the various agricultural agencies provided technical assistance. The College of Agriculture, Agricultural Experiment Station and the Agricultural Extension Service supplied planning information and personnel; the Soil Conservation Service assisted in developing a soil and water management program; the State Forestry Department assisted in cruising the timber, and a member of the Federal Reserve Bank reviewed the plans in regard to credit needs.

INITIAL SITUATION

A 310-acre tract bordering on Highway 18 between Grand Junction and Bolivar, Tennessee, in Hardeman County, was selected as the site for the Pilot Farm. This had been a typical run-down cotton farm located on a tract of land known as the "Pulliam Tract." This farm was valued at \$14,745 or \$75 per acre of open land and \$30 per acre of woodland. There were 86 acres of cropland, 35 acres of idle and open pasture, and 189 acres of woodland. According to the soil map there were 150 acres of Class I land, 5 acres of Class II land, 25 acres of Class III land, 25 acres of Class IV land, and 125 acres of Class V land on this farm (See Figure 1 for soil map)¹.

¹Land classes for soils on the Ames Plantation are based on the general use suitability and management requirements for groups of soils. Land Class I is very well suited to crops and pastures; Land Class II is well suited to crops and pastures; Land Class III is fairly well suited to crops and pasture; Land Class IV is poorly suited to crops but suited to pasture; and Land Class V is poorly suited to crops and pasture but suited to forestry.

[illegible]

Figure 1.—Soils map of the Pilot Farm, which contains 310 acres.

pasture (Appendix Table 1). Although over 50 percent of the land area was in timber, the woodland had never been regarded as part of this tenant farm. The tenant had taken fuel wood from the area and his livestock had grazed in the woods, but that was all the woodland contributed to his farm operation. Approximately two-thirds of the woods had been cut-over 10 years previously, but there was nearly 50 acres of old growth that was selectively cut the year this Pilot Farm was established.

The buildings, consisting of two tenant houses and a small barn, were in very poor condition. Workstock was used as a source of power. Fences were poor and inadequate to hold livestock.

Information on the farm operation in 1953 is given in Appendix Tables 1 through 4 as a benchmark for comparison with the long range plans developed for the Pilot Farm. The farm operations on this unit in 1953 indicate the general farming conditions existing in this general area.

PLANNING PHASE

Problems

The Planning Committee was confronted with a number of problems in setting up and putting into operation this Pilot Farm. Some of the major problems were:

1. Two or more long-run operating plans needed to be designed, and one selected and put into operation.
2. A considerable amount of capital had to be obtained to develop this farm since this 310-acre tract of land was practically without any improvements.
3. A satisfactory tenant had to be found, and new tenure arrangements had to be made which would be beneficial to both the landlord and tenant.
4. A time schedule for acquiring permanent improvements, including new buildings, fencing and land clearing, had to be outlined and coordinated with the operating plan selected.

Proposed Plans

Two complete farm plans were developed by the Planning Committee and several minor adjustments within these plans were considered. Plan I included cotton, beef cattle, hogs, and forestry as the major sources of income; there would be 25 acres of cotton,

36 beef cows, 10 brood sows and 133 acres of woodland (Appendix Tables 1 through 4). Plan II included cotton, beef cattle, small grain, and forestry as main sources of income; and there would be 20 acres of cotton, 45 beef cows, 30 acres each of soybeans and oats for grain, and 135 acres of woodland. It was estimated that gross annual income under Plan I would be \$16,450, compared with \$14,339 under Plan II. In both plans the estimated net income from forestry was based on production planned during the first decade rather than over a longer period of time. The income from forestry was estimated to be between the value of roadside sales and stumpage sales under intensive management as shown in Table 1. The net income from forestry was estimated at \$150 per year.

A labor force equivalent to two full-time men would be needed to carry out either of the two plans. Total cash and non-cash expenses excluding the pay received by the two full-time men would be \$10,331 under Plan I compared with \$9,102 under Plan II. In other words the net income available to pay regular farm labor and interest and principal on capital was set at \$6,119 under Plan I, compared with \$5,237 under Plan II. If the cotton acreage under Plan II had been increased from 20 to 25 acres (Plan I had 25 acres of cotton) the net income under Plan II would be increased approximately \$300. This change would have required more seasonal labor for cotton chopping and picking, a 5-acre decrease in soybeans and oats, and some additional costs for fertilizer, insecticides and ginning.

After a discussion of other possible modifications in these farm plans, Plan I was selected as the one to be used on this Pilot Farm. Following are some of the advantages and disadvantages of Plan I compared with Plan II:

Advantages:

1. Plan I provided \$882 more net income to pay regular farm labor, interest and principal on capital than Plan II.
2. The average investment in capital items such as machinery and livestock was approximately \$1,000 lower under Plan I than Plan II.
3. Plan I had a smaller acreage of double cropping than Plan II and the risk involved in getting one crop from land each year is less than in getting two crops.

Disadvantages:

1. Plan I had a larger acreage of row crops and a smaller acreage of close growing and sod crops than Plan II. Therefore, the danger of soil erosion under Plan I would be greater than under Plan II.
2. Cash operating expenses would be approximately \$1,300 higher per year under Plan I than Plan II.

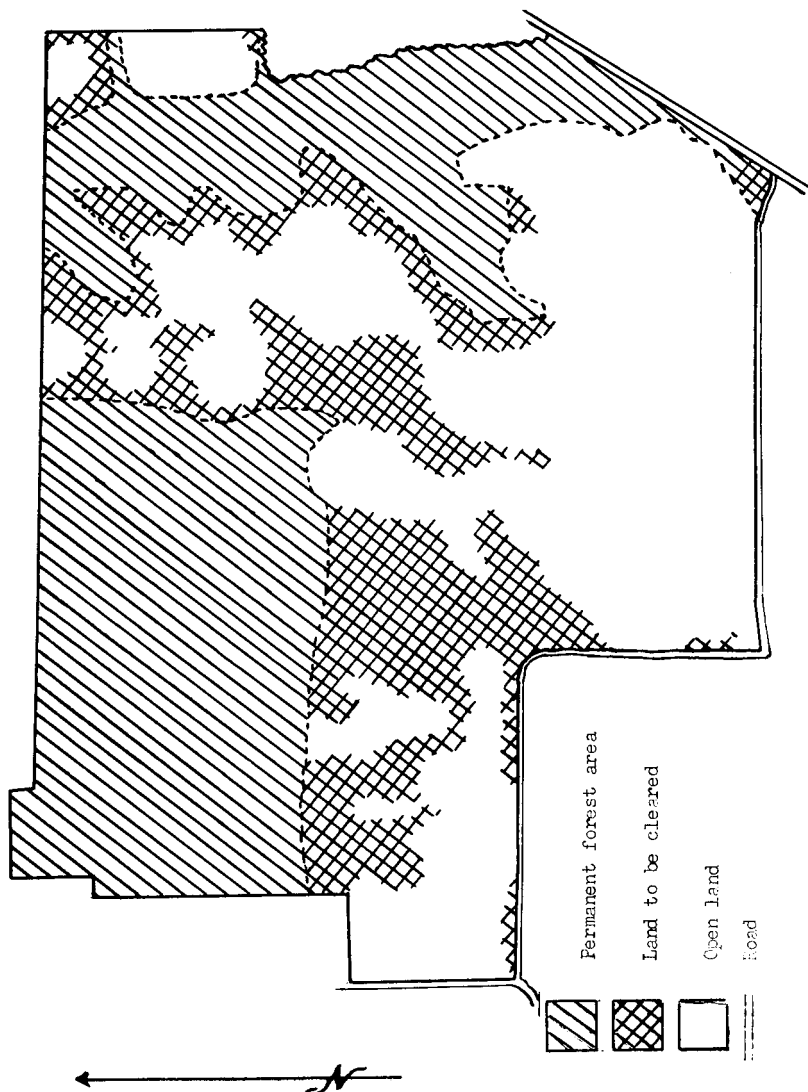


Figure 2.—Layout of land to be cleared under the proposed cotton-hog-beef system of farming

Land Use: A soil map of this farm is shown in Figure 1. The major soils on this farm consist of 20 BN (Memphis silt loam, eroded undulating phase); 22 BN (Loring silt loam, eroded undulating phase); 30 BN (Lexington silt loam, eroded undulating phase); 3 (Tigrett fine sandy loam); 6 (Dyer silt loam); 26 AL (Calloway silt loam, level phase); and 33 DL (Ruston fine sandy loam, eroded hilly phase).

The proposed boundaries of open land, to be used for crops and pasture, and the woodland under the long time plan are indicated in Figure 2. This figure also indicates the land to be cleared within the proposed crop and pasture areas.

According to the original plan, most of the row crops will be planted on the Memphis and Loring soils along the ridge extending from the south to the north borders of the farm. Cotton and corn will be grown almost continuously on this land. An attempt will be made to grow a legume, such as button clover, on the cotton acreage if feasible. If a winter legume can be grown it will reduce the erosion hazard and will supply organic matter as well as provide winter grazing for the beef cattle during some of the years. Corn will be grown continuously on the same land with the exception that the 10 acres of corn and cane silage can be rotated on the corn land and a winter cover crop will be seeded after silage is cut.

A mixture of alfalfa-orchard grass-ladino clover will be seeded on the Memphis, Loring and Lexington soils in the pasture area. This will be used for silage, hay and pasture early in the season. On the wet soils or hard pan soils, such as Calloway, Dyer and Henry, pasture crops such as Bermuda, fescue and clover will be grown.

Forestry: There were about 133 acres of permanent woodland on this farm after the proposed land-use plan had been adopted. These included about 80 acres of upland hardwoods and 26 acres of poorly stocked and open upland areas that had to be planted to pine in order to become productive. These woodlands were selectively cut before the Pilot Farm was established and part of the area had good hardwood growing stock.

The labor requirements and returns from forestry over the next 50 years were estimated for intensive and for extensive forest management. These estimates are based on yield projections and work performance data made on the Plantation¹. The data for this farm are summarized in Table 1.

¹Data for Planning Woodland Opportunities on West Tennessee Farms, unpublished bulletin, by Solon Barraclough and Alfred Pleasonton, Tennessee Agricultural Experiment Station.

Table 1—*Labor Requirements and Value of Yields by Decades from 133 Acres of Forest Land on the Pilot Farm, with Intensive and Extensive Management*

Years of managment	Intensive management ¹			
	With roadside sales		With stumpage sales	
	Labor (man days per decade)	Value of products sold (per decade)	Labor (man days per decade)	Value of products sold (per decade)
1 - 10	170	\$ 3,122	95	\$ 1,370
11 - 20	274	4,583	13	1,822
21 - 30	362	15,785	13	4,949
31 - 40	430	16,714	13	10,552
41 - 50	614	31,659	13	21,448
51 - 60	616	31,659	16	21,448
Average per decade after 60 years	500	\$23,677 ²	16	\$15,777 ²
	Extensive management ³			
1 - 10				\$ 2,005
11 - 20				0
21 - 30	No cultural work is required			390
31 - 40				2,085
41 - 50	and only stumpage sales are			0
51 - 60				2,960
Average per decade after 60 years	made under extensive management			\$ 532 ⁴

¹The initial value of growing timber is about \$4,000 while after 60 years of intensive management the average value of growing stock is about \$16,000.

²The sales from the 26 acres of pine timber would average less than shown during the 40- to 60-year period when present plantings would reach their peak production.

³The value of growing stock following 60 years of extensive management is about \$600.

⁴The present volume of growing stock on the farm is greater than on the average West Tennessee farm. It is expected that the volume and quality after 60 years would approach the average now found on other farms in the area.

It was decided to follow the intensive forest management program on this farm. The operator will have about 17 days per year of forestry work during the first decade. In later decades he will have up to 61 days of woods work per year if he does all of his own harvesting.

Forestry income will increase from an average of about \$312 per year during the first decade to about \$3,166 per year after 40 years, assuming that the operator does his own harvesting. About \$550 will be required to get the stand improvement and planting program underway early in the first decade, but sales of forest products later in the same decade will more than repay this sum.

At present the farm supports about 230 m.b.f. (International Rule) of hardwood sawtimber (about 200 m.b.f. Doyle rule, which is the local measure). This would probably sell for about \$4,000 stumpage on present markets. After 40 years of management,

the volume of growing stock would be about doubled and its value increased to approximately \$16,000 at the present price level.

Livestock: The livestock programs for both beef cattle and swine were based on research findings of the Tennessee Agricultural Experiment Station.

A grade herd of Angus cows will be selected out of the herd on the Central Unit of the Plantation as the basis for a cow-calf program. A purebred Angus bull will be used. The replacement heifers will be selected on the basis of performance of both calf and cow. The cows will be bred to calve from approximately January 1 through May 15th. The cow herd will be wintered on silage and hay and pastured during the rest of the year. The plan is based on a 90 percent calf crop. The weaned calves will be wintered on high grade roughage and a limited amount of grain with cottonseed meal. When available the winter legume seeded in the cotton or after corn and cane silage will be grazed.

The heifers, because they fatten more easily, will be given a 60- to 90-day feed in the spring and marketed in May or June weighing approximately 750 pounds. The steers will be carried through the summer on pasture, full-fed a grain ration for 60 to 90 days, and sold in October or November weighing approximately 900 to 950 pounds depending on condition of cattle, feeds available, and market conditions.

The swine program will be initiated with the purchase of 10 Duroc gilts from the West Tennessee Experiment Station. A boar will be purchased from some desirable source. Sows will be bred to produce two litters per year with an estimated 7 pigs per litter. The corn produced on the farm will be marketed largely through hogs. The market hogs will be self-fed primarily on alfalfa-ladino clover pasture plus a supplement of tankage and soybean meal. They will be sold at an average weight of approximately 220 pounds.

Capital Needs: The Will Trustees of the Hobart Ames Foundation agreed to advance the capital needed to set up this Pilot Farm.

It was recognized by the Planning Committee that more capital would be required to set up this Pilot Farm than ordinarily would be required to convert a cotton farm into a more efficient type of farming with other crops or livestock added. Reasons for the higher costs in setting up the Pilot Farm are:

1. Ordinarily a farmer will shift gradually from his present type of farming to another type of farming. On this Pilot Farm, one of the objectives was to see how quickly the shifts could be made and this resulted in higher initial costs.
2. Usually the farmer will work for a lower wage or labor return during the time changes are being made in his farm organization because he expects to reap the benefits of these changes at a later date. In the case of the Pilot Farm, the operator might be asked to "try new practices" which in some instances might prove unprofitable, especially in the short run. Therefore, it would be necessary to offer the operator a higher minimum wage than the owner-operator would receive in the early stages where changes were undertaken.
3. The farmer will ordinarily have on hand for current operations some feed supplies, livestock and equipment. Also, he usually will have some usable buildings and fences. No such inventories were available on the Pilot Farm at the beginning of the adjustment period.

The estimated capital needed to place this Pilot Farm in operation is shown in Table 2. Again it should be recognized that an estimated \$16,894 would be used for current operating expenses

Table 2—*Estimated Cash Outlay Required for Current Operating Expenses and Capital Improvements During Transition From Present Operations to Proposed Cotton-Beef-Hog-Forestry System on Pilot Farm*

Cash outlay	Year			Total
	1955	1956	1957	
1. Current operating fund	\$11,065 ¹	\$ 5,829 ²	— ³	\$16,894
2. Capital improvements:				
Buildings, fences,				
land clearing	12,627	3,600	\$500	16,727
Machinery	10,116	2,264	—	12,380
Livestock	3,835	2,700	—	6,535 ⁴
Total	\$37,643	\$14,393	\$500	\$52,536⁴

¹This would cover all cash operating expenses except \$720 for cotton picking which is taken out of cotton receipts.

²By using all of cotton receipts from 1955 except the \$720 (Footnote 1) for operating expenses in 1956, the cash receipts would lack only \$329 in balancing cash expenses. However, since crop receipts come primarily in the fall approximately \$5,500 for current operating funds would be needed.

³Cash receipts exceed cash expenses by \$150 which can be set aside for depreciation and interest payment.

⁴Includes value of beef cattle transferred from Central Unit, Ames Plantation to this farm.

during the period 1955 through 1957 while income is being increased on this farm. Approximately \$35,642 would be needed for new building, fencing, equipment and livestock. It was agreed that the beef cattle would be transferred from the Central Unit of the Ames Plantation to this Pilot Farm without a cash outlay at the time of transfer.

Tenure Arrangements: It was agreed by the Planning Committee that a written tenure agreement should be drawn up which would provide the operator of the Pilot Farm with a guaranteed annual wage. Important features of such an agreement would be as follows:

1. It would provide an incentive for the operator by including a graduated division of the "net farm income" in his favor.
2. It would provide for the security of the operator and his family and protect the Ames Plantation.
3. It would indicate how the planning is to be carried out. If the operator's labor force is too small and it is essential to hire a second regular worker, this worker would be employed on a straight salary and would be directly responsible to the farm operator.

Permanent Improvements: It was decided that a dwelling for the operator, barn, tool shed and crib should be built, and that most of the permanent fencing should be done the first year. A dwelling for a wage hand, if a wage hand is necessary, would be built the second year. Most of the farm machinery and equipment would be purchased the first year. The silage field harvester would be added during the second year of operation.

ACTUAL OPERATING PHASE

One of the most serious weaknesses in farm planning is the failure to design the step-by-step process involved in moving from the existing situation to the long-time plan. Many good farm plans have not been followed because the transition period was not worked out. An attempt has been made to work out the step-by-step processes in moving to the long-time plan on this farm.

Selecting Operator

It was decided by the Planning Committee that the operator of this farm should be a local farmer who had owned a small

farm or had been a tenant and could follow plans and keep records. His family should possess initiative and ability to enter wholeheartedly into this undertaking.

Mr. Wiley L. Land, a 42-year-old man with a wife and two daughters was chosen to operate the Pilot Farm. Mr. Land had completed the seventh grade in school and had operated a nearby farm as a tenant. He had received aid in farm planning and financial assistance through the Farmers Home Administration. As a result of farming on hardpan soils, which are susceptible to drought, Mr. Land's production had been low. The family was recommended by the FHA supervisor since Mr. Land had been a cooperative client and had kept good records. At the time he was selected by the Committee, Mr. Land had sold his livestock and had settled his account with the FHA and was planning to go to California to work in industry.

The farm plan was based on a two-man operation. Therefore, it was necessary to employ a hired hand on a monthly salary to assist Mr. Land. A man who had lived on the Plantation for a number of years was selected. He has a fourth-grade education and his family includes a wife and two daughters.

It was decided that Mr. J. M. Bryan, Assistant Manager of the Ames Plantation and a member of the Planning Committee, would work directly with Mr. Land to insure that the proposed plans were carried out.

Tenure Arrangements

A written lease agreement providing a guaranteed annual wage plus a share of the profits was made with Mr. Land (see Lease Agreement in the Appendix). Mr. Land receives \$2,400 salary per year regardless of farm income. From the gross farm income are subtracted the total cash farm operating expenses, which includes depreciation and the \$2,400 paid Mr. Land. The next \$2,400 in net farm income is used to repay borrowed capital. Then, for each additional \$1,000 in net farm income Mr. Land will receive 50 percent of the first \$1,000, 60 percent of the second \$1,000, 70 percent of the third \$1,000, and 75 percent of all net income above this amount.

First Year's Operation (1955)

Changing a depleted 310-acre farm without any improvements into a going farm system was a difficult job. Mr. Land moved

into an old house on the Ames Plantation until a house could be built on this farm. He moved into the new house on May 16, 1955. In the meantime, between January and May 1955, he worked

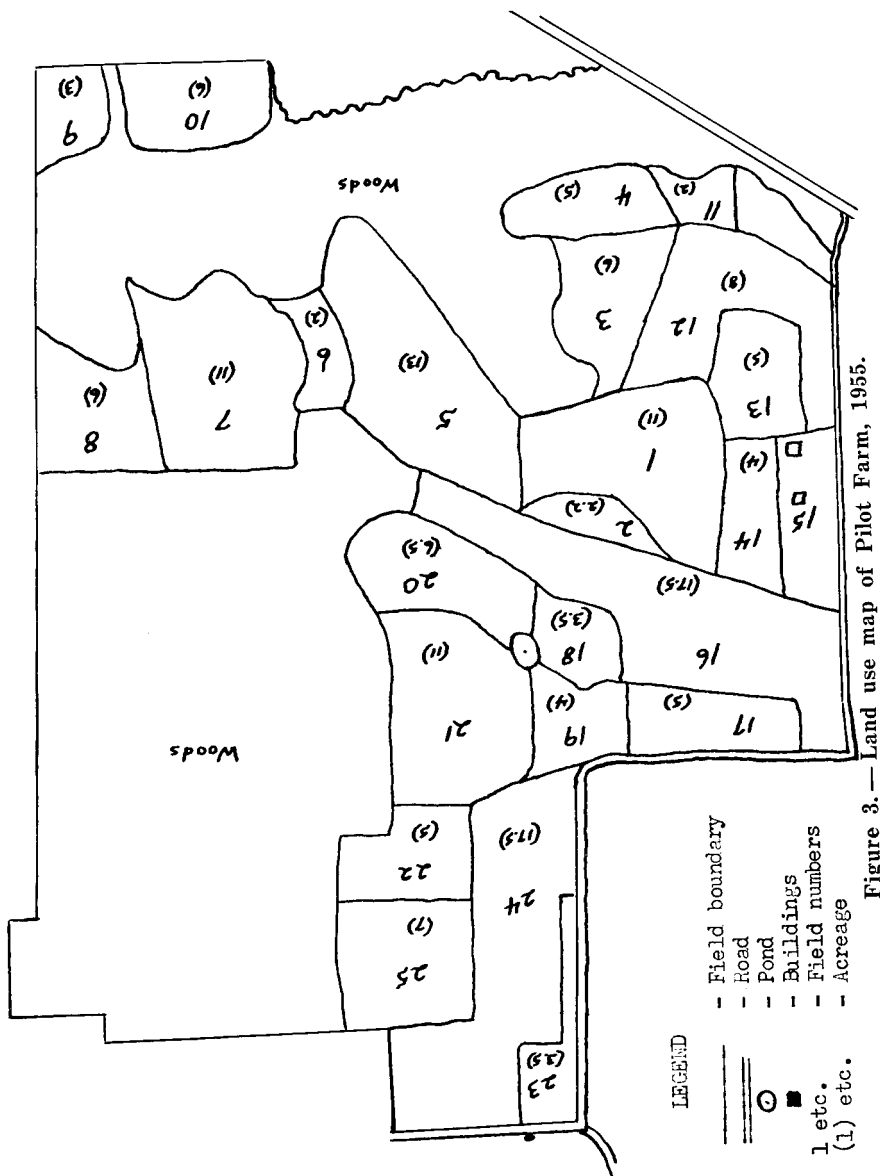


Figure 3.— Land use map of Pilot Farm, 1955.

Table 3—*Cropping Program for the Pilot Farm, 1955*

Field No.	Acres	Crop	Recommended varieties	Rate of planting	Soil Test Values pH P K	Fertilization per acre	Estimated yields per acre	Recommended planting date
1	11.0	Corn	Tenn. 29	8,000-12,000 stalks per acre 36" rows 22" - 15" 40" rows 20" - 13" 42" rows 19" - 12"	4.9 22(M) 360(H)	3 T. lime; 200# 4-12-4 at planting; 200# am. nit. side dressing	50 bu.	April 15 to May 30
2	2.2	Corn	Same as field 1	Same as field 1	5.1 11(L) 180 (M)	3 T. lime; 400# 4-12-4 at planting; 300# am. nit. side dressing	70 bu.	April 15 to May 30
3	6.0	Corn	Same as field 1	Same as field 1	5.1 8(L) 250 (H)	3 T. lime; 300# 4-12-4 at planting; 200# am. nit. side dressing	50 bu.	April 15 to May 30
4	5.0	Cotton	Empire or Tenn. 241	1 bu./acre	5.1 7(L) 288(H)	3 T. lime; 400# 4-12-4 at planting; 100# am. nit. side dressing	1 bale	April 20 to May 10
5	13.0	Cotton	Same as field 4	Same as field 4	4.7 8(L) 288(H)	3 T. lime; 400# 4-12-4 at planting; 100# am. nit. side dressing	1 bale	April 20 to May 10
6	2.0	Soybeans for hay	Ogden	1½ - 2 bu.	No soil sample soil similar to field 16	3 T. lime; 250# 48% Super phos.; 100# am. nit. at seeding		May 1 to June 1

7	11.0	Corn	Same as field 1	Same as field 1	5.0 7(L) 288(H)	3 T. lime; 300# 4-12-4 at planting; 200# am. nit. side dressing	50 bu.	April 15 to May 30
8	6.0	Corn	Same as field 1	Same as field 1	No soil sample soil similar to field 7	3 T. lime; 300# 4-12-4 at planting; 200# am. nit. side dressing	50 bu.	April 15 to May 30
9	3.0	Corn	Same as field 1	Same as field 1	No soil sample soil similar to field 10	3 T. lime; 400# 6-12-12 at planting; 300# am. nit. side dressing	70 bu.	April 15 to May 30
10	6.0	Corn	Same as field 1	Same as field 1	5.1 10(L) 88(L)	3 T. lime; 400# 6-12-12 at planting; 300# am. nit. side dressing	70 bu.	April 15 to May 30
11	2.0	Sericea		30 lbs. per acre	No soil sample soil similar to field 21	3 T. lime; 250# 48% Super phos.; 100# am. nit. at seeding	1½ T.	April 20 to May 30
12	8.0	Hog pasture Fescue Ladino clover	Fescue Ladino clover Bermuda grass	10 - 12 lbs. 2 lbs. (put in with manure spreader)	5.1 6(VL) 120(L)	3 T. lime 1000# 3-12-12 broadcast at seeding		February 20 to March 15
13	5.0	Hog pasture Alfalfa Orchard grass Ladino clover	Williams- burg or Atlantic alfalfa; Native orchard grass Ladino clover	15-20# alfalfa 4-6# orchard grass 2# Ladino clover	5.0 13(L) 280(H)	3 T. lime 200# 48% Super phos.; 50#-100# am. nit. at seeding		February 20 to March 15

Table 3 — (Continued)

Field No.	Acres	Crop	Recommended varieties	Rate of planting	Soil Test Values pH P K	Fertilization per acre	Estimated yields per acre	Recommended planting date
14	4.0	Bermuda grass Fescue & Ladino clover	Fescue Ladino clover Bermuda grass	Same as field 12	5.1 8(L) 168(H)	3 T. lime 1000# 3-12-6 broadcast at seeding		February 20 to March 15
15		New building site						
16	17.5	Cattle pasture Fescue & Ladino clover Bermuda grass	Fescue Ladino clover Bermuda grass	Same as field 12	4.8 12(L) 328(H)	3 T. lime 250# 48% Super phos.; 100# am. nit. at seeding		February 20 to March 15
17	5.0	Cattle pasture Alfalfa Orchard grass Ladino clover	Same as field 13	10 lbs. orchard grass 15 lbs. alfalfa 1 lb. ladino clover	5.1 10(L) 180(N)	3 T. lime; 1000# 3-12-6 at seeding		February 20 to March 15
18	3.5	Cattle pasture not clear'd	Same as field 13 when cleared		No soil test yet	—		
19	4.0	Cattle pasture not cleared	Same as field 12 when cleared		No soil sample soil similar to field 16	3 T. lime; 250# 48% Super phos.; 100# am. nit. at seeding		
20	6.5	Spring oats	No. 205	2 bu./acre	5.1 12(L) 270(H)	3 T. lime; 200# 20% super; 100# am. nit. at seeding	30 bu.	February 20 to March 15

20	(6.5)	Cattle pasture Orchard grass Alfalfa Ladino clover	See field 13	See field 13	5.1 12(L) 270(H)	250# 48% Super phos.; 100# am. nit.		August 15 to Sept. 15
21	11.0	Cattle pasture to be cleared	Same as field 13 when cleared					
22	5.0	Spring oats	M. 0205 Spring oats	2 bu./acre	5.1 2(VL) 340(H)	3 T. lime; 300# 20% Super; 100# am. nit. at seeding	30 bu.	February 20 to March 15
22	(5.0)	Cattle pasture Alfalfa Orchard grass Ladino clover	See field 13	See field 13	See above	300# 48% Super phos.; 100# am. nit. at seeding		August 15 to Sept. 15
23	3.5	Spring oats	M. 0205 Spring oats	2 bu./acre	No soil sample see field 22	3 T. lime; 200# 20% Super phos; 100# am. nit. at seeding	30 bu.	February 20 to March 15
23	(3.5)	Cattle pasture Fescue Ladino clover Bermuda grass	Same as field 14	Same as field 12		300# 48% Super phos; 100# am. nit.		August 15 to Sept. 15

Table 3 — (Continued)

Field No.	Acres	Crop	Recommended varieties	Rate of planting	Soil Test Values pH P K	Fertilization per acre	Estimated yields per acre	Recommended planting date
24	17.5	Spring oats	M. 0205 Spring oats	2 bu./acre	5.1 2(VL) 208(H)	3 T. lime; 200# 20% Super phos.; 100# am. nit. at seeding	30 bu.	February 20 to March 15
24	(17.5)	Cattle pasture Alfalfa Orchard grass Ladino clover	See field 13	See field 13	No soil sample soil similar to field 13	300# 48% Super phos.; 100# am. nit.		August 15 to Sept. 15
25	7.0	Cattle pasture not cleared	—	—	—	—	—	—

on building the house and fences, general cleaning up jobs, and getting his crops planted.

Crops: Details on the planned field arrangements, crop varieties, rate of planting, soil tests, fertilization practices, estimated yields and planting dates for 1955 are shown in Figure 3 and Table 3. These data were prepared in January 1955. It should be pointed out that due to unfavorable seasons, as well as failure to get land clearing completed on schedule some of the crop acreage was not planted. Too, some of the field arrangements were changed at a later date as indicated in Figure 4.

When the plans were approved for establishing this farm the Planning Committee suggested that an attempt be made to establish 5 acres of alfalfa in the fall of 1954 to provide some hay for livestock in 1955. This could not be accomplished because of the dry weather. It was planned also to seed 16 acres of oats to be used for hay, 17 acres of Bermuda grass and white clover pasture and 11 acres of alfalfa-orchard grass pasture in the spring of 1955. Even though spring seeding of these crops (with the exception of Bermuda grass) is not usually recommended, it was thought that success with these crops would enable livestock to be added on the farm at the earliest possible date. Due to a wet spring in 1955 these crops could not be seeded.

Seventeen acres of cotton were planted in 1955 out of an allotment of 18 acres (Table 4). This allotment had been reduced from 20 acres in 1954 to 18 acres in 1955. Cotton was planted between April 29 and May 2. Cotton yields averaged 608 pounds of lint per acre, compared with an estimated 500 pounds per acre; that is, these yields were 108 pounds of lint per acre higher than estimated. The total cotton crop amounted to 20.5 (500-pound) bales.

Approximately 50 acres of corn were planned for 1955, 41-acres on upland soils and 9 acres on bottomland soils. Around 20 acres of potential corn land needed to be cleared by early 1955 in order to plant the 50 acres of corn. It was impossible to get this clearing done in time to get corn planted, and as a result the corn acreage was reduced to around 24 acres on upland soils and 6 acres on bottomland soils. This corn was planted between May 3 and May 9. The reduction in corn acreage was partly offset by increased yields in 1955. For example, while yields on upland corn had been estimated at 50 bushels per acre, these yields actually averaged around 65 bushels per acre. Similarly,

yields on bottomland corn had been estimated at 75 bushels per acre, but actually averaged nearly 80 bushels per acre. Total corn production had been estimated at 2,725 bushels and the actual crop amounted to 2,100 bushels.

Since spring pastures could not be established in 1955, summer fallowing was carried out, and around 70 acres of pasture were seeded between September 12 and September 19. Approximate

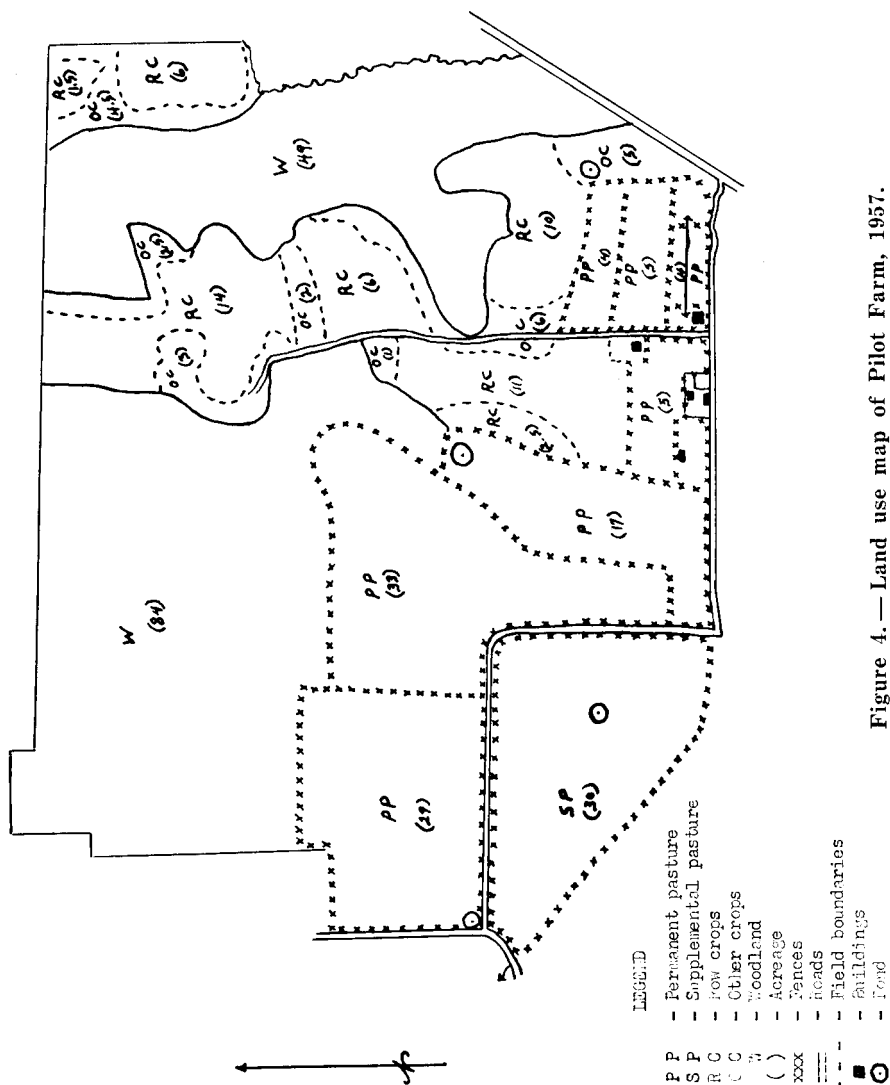


Figure 4. — Land use map of Pilot Farm, 1957.

Table 4—*Actual Land Use in 1955 and 1956, Estimated Land Use in 1955, 1956, 1957 and Long Time Plan on Pilot Farm*

Land use ¹	1955		1956		1957 Long Time Plan	
	Estimated acres	Actual acres	Estimated acres	Actual acres	Estimated acres	Estimated acres
Cotton	20.0	17.0	18.0	17.7	21.0	25.0
Corn, upland	41.0	24.0	36.0	21.0	20.0	36.0
Corn, bottomland	9.0	6.0	9.0	9.0	29.0	9.0
Corn & cane silage	—	—	—	—	10.0	10.0
Oats	(16.0)	—	—	—	—	—
Lespedeza, sericea or soybeans	6.0	—	4.0	27.0	29.0	12.0
Button clover	(2.5)	—	—	—	—	(25.0)
Oats & crimson clover	8.0	—	—	—	(10.0)	(10.0)
Alfalfa-orchard grass hay	—	—	—	—	—	12.0
Fescue & clover pasture	17.0 ²	30.0	30.0	30.0	30.0	23.0
Alfalfa-orchard grass-clover pasture	21.0 ³	40.0	80.0	67.0	67.0	50.0
Sudan grass pasture	—	—	—	—	15.0	—
Lespedeza or bermuda pasture	—	—	—	—	15.0	—
Garden, roads, etc.	—	5.0	—	5.3	5.0	—
Woodland	188.0	188.0	133.0	133.0	133.0	133.0
Total acres	310.0	310.0	310.0	310.0	374.0	310.0 ⁴

¹Double cropping indicated by ().²Originally planned to include Bermuda grass on this pasture area.³This includes 10 acres which were planned for alfalfa hay and 11.0 acres of this pasture mixture.⁴310 acres originally believed to be adequate, but this has been increased to 374 acres.

mately 13 acres of pasture were established for swine and 57 acres for beef cattle. A mixture of alfalfa-orchard grass-ladino clover was seeded on the better drained soils while fescue and ladino clover were seeded on poorly drained soils such as Calloway, Dyer and Henry. In seeding alfalfa and orchard grass for the swine pasture, around 5 pounds more alfalfa and 5 pounds less orchard grass were seeded per acre than on pasture for beef cattle (Table 3).

Livestock: Ten Duroc gilts and one boar were purchased in the late summer of 1955 (Table 5). The 10 gilts cost a total of \$318 and the boar \$75. It was thought by the Planning Committee that the quickest way to increase cash farm income was to bring in swine in the fall of 1955 provided the corn crop was adequate. Then by 1956 the first hogs would be marketed and the income from hogs should average around 50 percent of that set up in the long-time plan. By 1957 two litters would be marketed from each of the sows in accordance with long-time plans.

The beef cattle were not transferred to this farm in 1955 since pastures and other feed supplies were not available.

Table 5—*Number and Kind of Livestock in 1955 and 1956, Estimated Number and Kind of Livestock in 1955, 1956, 1957, and Long Time Plan on Pilot Farm*

Kind of livestock	1955		1956		1957	Long time plan
	Estimated number	Actual number	Estimated number	Actual number	Estimated number	Estimated number
Milk cows	2	—	2	2	2	2
Beef cows	20	—	20 to 30	30	30	36
Bulls	1	—	—	—	—	2
Calves born	1	—	20 to 29	30 ¹	27 ¹	34
Veal calves	1	—	—	2	1	2
Yearling heifers	—	—	—	—	15	16
Yearling steers	—	—	—	—	12	16
Brood sows	10	10	10	10	10 ²	10
Boars	1	1	1	1	1	1
Pigs weaned	—	—	120	142	120	140
Hogs sold ³	4	—	60	65	120	140

¹Thirty calves were transferred with 30 cows to this farm in 1956. Three cows and three calves were sold from the herd by February, 1957.

²The number of sows might be increased in the fall of 1957 to 12 or 13, depending upon the corn crop.

³Includes hogs furnished operator and wage hand.

Income and Expenses: Total cash income from crops amounted to \$3,737 or \$86 more than estimated in 1955 (Table 6). Even though the actual cotton acreage was 3 acres below the amount planned, higher yields and a higher price for lint more than offset the reduction in acreage. Five tons of cottonseed were carried in inventory and not sold until 1956. Even though \$150 was the estimated income from forestry work, no forestry work was done in 1955.

Livestock receipts amounting to \$207 were estimated for 1955. It was thought that these receipts would come from veal calves, from the milk cows and four cull gilts, if 14 gilts were purchased as shoats and culled down to 10 gilts. However, since only 10 gilts and no milk cows were purchased, there were no livestock receipts in 1955. At the same time, costs were reduced by not having these extra livestock.

Total cash income from crop and livestock plus discounts earned was \$3,807 in 1955, or \$51 less than estimated.

Non-cash income was approximately 50 percent less than estimated. It totaled \$2,440, compared with an estimated \$4,940. Most of this reduction in non-cash income was due to a smaller crop of corn and a lower value of corn in inventory than was expected. The total corn yield was 625 bushels less than estimated because of the reduction in acreage. Corn in inventory was valued

Table 6—*Actual Income in 1955 and 1956, Estimated Income in 1955, 1956, 1957, and Long Time Plan on Pilot Farm*

Item	1955		1956		1957	Long time plan
	Estimated	Actual	Estimated	Actual	Estimated	Estimated
Cash income:						
Cotton, lint	\$ 3,000	\$ 3,640	\$ 3,105	\$ 4,119	\$ 3,750	\$ 4,688
Cottonseed	501	97	540	808	384	780
Forestry	150	—	150	—	150	150
Total crops	3,651	3,737	3,795	4,927	4,284	5,618
Cows	—	—	—	142	—	450
Calves from						
dairy cows	44	—	44	151	44	88
Heifers	—	—	—	—	1,000	1,800
Steers	—	—	—	42	1,500	3,040
Hogs	163	—	1,914	2,324	4,220	5,454
Hogs furnished						
operator & wage						
hand	—	—	—	170	—	—
	207	—	1,958	2,829	6,764	10,832
Total cash crops						
& livestock	3,858	3,737	5,753	7,756	11,048	16,450
Discounts earned	—	70	—	22	—	—
Total cash income	\$ 3,858	\$ 3,807	\$ 5,753	\$ 7,778	\$11,048	\$16,450
Non-cash income:						
Inventory increase						
Livestock ¹	70	—	2,590	4,683	160	—
Feed & seed	4,870	2,440	200	763	1,331	—
Total non-cash						
income	4,940	2,440	2,790	5,446	1,491	—
Total cash & non-						
cash income	\$ 8,798	\$ 6,247	\$ 8,543	\$13,224	\$12,539	\$16,450
Net cash farm income²:						
(cash income less cash						
expenses)	—\$6,931	—\$4,527	—\$4,960	—\$ 80	\$ 12	\$ 4,146
Net farm income²						
(Total cash & non-						
cash income less						
total cash & non-						
cash expenses)	—\$3,412	—\$2,974	—\$3,388	\$ 3,763	—\$ 319	\$ 2,219

¹Represents inventory increase above beginning inventory and purchases during the year.²These terms are not used in the usual manner. In both instances the fixed salary of the operator has been deducted before arriving at the net cash farm income and net farm income.

at \$1.00 per bushel compared with an estimated price of \$1.60. Since the corn was fed primarily to hogs, the final value depended upon the price of hogs. If the corn-hog ratio had not been very favorable, it might have been better to sell corn rather than feed it. Other non-cash income consisted of 5 tons of cotton seed and \$165 in purchased feeds in inventory.

Total cash and non-cash income was \$6,247 compared with an estimated \$8,798.

Total cash operating expenses including the wages of the hired hand and operator were estimated to be \$10,789 in 1955 (Table 7).

Table 7 — *Expenses in 1955 and 1956, Estimated Expenses in 1955, 1956, 1957, and Long Time Plan on Pilot Farm*

Item	1955		1956		1957	Long time plan
	Estimated	Actual	Estimated	Actual	Estimated	Estimated
Cash expenses:						
Fertilizer & lime	\$ 3,655	\$ 3,510	\$ 1,940	\$ 1,072	\$ 2,273	\$ 3,001
Seed	530	759	525	77	434	606
Poison	112	54	115	124	147	140
Ginning & storage	170	189	178	298	300	264
Cottonseed meal	—	—	44	58	270	238
Tankage or meat scraps	30	20	225	335	297	525
Soybean meal	22	15	193	197	198	385
Alfalfa meal	—	20	185	43	198	—
Veterinary & medicine	26	—	100	179	120	225
Auction fees	—	—	30	56	104	118
Misc. livestock	—	—	65	—	205	134
Fuel, grease & oil	365	363	365	240	450	417
Truck	75	18	—	21	50	175
Machinery repairs	253	58	200	—	200	310
Bldg. & fence repairs	340	96	150	43	150	400
Taxes, insurance	150	250	150	503	150	150
Misc. supplies	441	255	235	121	420	200
Electricity & telephone	—	36	—	47	50	—
Hogs furnished operator & wage hand	—	44	—	170	—	—
F. I. C. A.	—	255	200	163	200	—
Office expenses	—	315	315	300	300	—
Rental equipment	—	730	1,178	730	200	—
Day labor	720	565	720	811	720	1,116
Hired hand	1,500	—	1,200	—	1,200	1,500
Operator's labor	2,400	782 ¹	2,400	2,270 ²	2,400	2,400
Total cash expenses	10,789	8,334	10,713	7,858	11,036	12,304
Non-cash expenses:						
Depreciation:						
Machinery	1,012	391	607	545	643	1,238
Buildings	311	320	397	770	880	351
Fences & other improvements	98	176	98	288	175	98
Death loss:						
Livestock	—	—	116	—	124	240
Total non-cash cost	1,421	887	1,218	1,603	1,822	1,927
Total cash & non-cash expenses	\$12,210	\$ 9,221	\$11,931	\$ 9,461	\$12,858	\$14,231

¹\$2,904 in wages paid operator and hired hand was capitalized into buildings, fences, etc., (See Table 8).

²\$1,330 in wages paid operator and hired hand was capitalized into buildings, fences, etc., (See Table 8).

These expenses were \$2,455 lower than estimated. This change in operating expenses was brought about by two alterations in plans. First, the operator and wage hand spent 290 days on construction of new buildings and fences and as a result, \$2,904 in wages was capitalized into new buildings and fences (Table 7). Second, a large part of the farm machinery was leased instead of purchased in 1955 and the rental cost amounted to a cash operating expense of \$730. If the farm machinery had been purchased as originally planned this rental cost would have been a non-cash depreciation charge.

Fertilizer, lime, fuel and labor were the major items of cash cost. A total of 28.7 tons of solid fertilizers was used. In addition to this solid fertilizer, anhydrous ammonia was applied to the cotton and corn at a total cost of \$270.00. Approximately 427 tons of lime was applied on crop and pasture land at the rate of 3 tons per acre. During the year 1,875 gallons of gasoline, 70 pounds of chassis grease and 18 gallons of oil were used. In addition to wages for the hired hand and operator, \$565 in day labor was used in chopping and picking cotton.

Non-cash expenses were \$887 or \$534 less than estimated. Depreciation on farm machinery accounted for this reduction in non-cash expenses. It should be pointed out again that the actual depreciation charges on machinery (\$391) plus the cash rentals for equipment (\$730) were higher than the estimated depreciation charges on machinery.

Total cash and non-cash expenses were \$9,221 or \$2,989 lower than estimated (Table 7).

The net cash farm income was -\$4,527 compared with an estimated -\$6,931 (Table 6). This meant that the cash loss during the year was \$2,404 less than estimated. (Remember that payments to the operator and to the wage hand have been included in cash expenses.) It was recognized in planning the first year's operation that cotton would be practically the only source of cash income. Too, a large portion of the expenses would be in establishing pastures and other crops to be used in later years when livestock were brought on this farm.

Net farm income was -\$2,974 compared with an estimated -\$3,412; thus the losses were \$438 less than anticipated.

Capital Investment: In addition to the \$393 invested in swine breeding stock in 1955, \$19,782 was invested in buildings, fencing, farm machinery and equipment and a truck (Table 8). Included

Table 8—*Estimated Cash Cost and Actual Cost of Capital Investments (Excluding Livestock) on Pilot Farm in 1955 and 1956*

Kind of investment	Estimated total cost	Actual cost		Total actual cost 1955-56	Depreciation		Value Dec. 31, 1956
		1955	1956		1955	1956	
Dwelling, operator	\$ 5,000	\$ 6,871 ¹	—	\$ 6,871	\$171	\$ 344	\$ 6,356
Dwelling, wage hand	3,000	3,845 ²	\$ 48	3,893	33	195	3,665
Well	—	543	—	543	45	54	444
Barn and tool shed	4,000	2,476 ³	—	2,476	62	124	2,290
Crib	1,000	1,066 ⁴	—	1,066	9	53	1,004
Farrowing house ..	250 ⁷	—	—	—	—	see farm machinery	—
Trench silo	200	—	—	—	—	—	—
Ponds	200	—	200	200	—	10	190
Land clearing	2,100	—	1,352 ⁵	1,352	—	—	1,352
Fencing	977	2,347 ⁶	877 ⁶	3,224 ⁶	176	278	2,770
Farm machinery and equipment	12,380	1,254	926 ⁷	2,180	75	200	1,905
Truck	—	1,380	—	1,380	316	345	719
Total	\$29,107	\$19,782	\$3,403	\$23,185	\$887	\$1,603	\$20,695

¹\$744 in farm labor capitalized into operator's dwelling in 1955.

²\$240 in farm labor capitalized into wage hand's dwelling in 1955.

³\$468 in farm labor capitalized into barn and tool shed in 1955.

⁴\$192 in farm labor capitalized into corn crib in 1955.

⁵\$472 in farm labor capitalized into land clearing in 1956.

⁶\$1,260 in farm capitalized into fencing in 1955 and \$558 in 1956 for a total of \$1,818.

⁷\$300 in farm labor capitalized into farm equipment by farrowing houses built in 1956.

in this \$19,782 was \$2,904 for farm labor used to construct improvements.

A two-bedroom house with a small basement, bath and electric heat was completed for the operator around May, 1955. Even though the original plans indicated that the wage hand's house would be built in 1956, it was started in September, 1955, and was practically completed by December, 1955. This is a two-bedroom house with bath. It will be heated by wood or coal. A well was drilled to supply water for both dwellings as well as for livestock. A pole-type barn was built between June and December, 1955. A tool shed with a small shop area was also built. The corn crib, which was constructed between September and December, 1955, stores 2,000 bushels of ear corn.

It was estimated that 810 rods of 4-strand barbed wire, primarily for the cattle pasture; and 300 rods of 32-inch woven wire for the hog pasture would be needed. Some changes were made in the pasture arrangement and 1,100 rods of 4-strand barbed wire and 300 rods of 32-inch woven wire was actually purchased in 1955. The ponds and trench silo were not dug in 1955.



Improvement of buildings on the Pilot Farm is shown here. Upper left is the old house on the Pilot Farm. Upper right is the comfortable dwelling constructed for the operator. The lower picture shows the farmstead, left to right; the new barn, the wage hand's dwelling in background, the tool shed, the operator's house at right; and in far right background is the new corn crib.

It was planned that one large tractor and one small tractor would be purchased. However, it was possible to lease the tractors and part of the equipment for a two-year period for 10 percent of the dealer's list price annually. The following equipment was leased in 1955: 2 John Deere "60" tractors, 1 cultivator, 1 disk tiller, 1 disk harrow, planting attachments and fertilizer attachments. In addition, the following equipment was purchased: 1 farm trailer, 1 Ezee Flow distributor, 1 section harrow, 1 crop duster, 3 cyclone seeders, 1 anvil, 1 tool sickle grinder, a lawn

mower and a few miscellaneous pieces of equipment. A total of \$1,254 was spent for this machinery and equipment in 1955 (Table 8).

Even though specific funds were not designated for purchasing a truck, it seemed essential to have one and part of the funds set up for purchasing farm machinery and equipment was used to purchase a truck in early 1955.

The estimated value of this 310-acre farm was \$14,745 when the Pilot Farm operation was started. The total investment in land, buildings, fences, machinery and equipment, livestock, feed, and seed at the end of the first year's operation after deducting depreciation charges was \$36,473 (Table 9.) This represented an increase of \$21,728 in salable assets during the first year's operation.

Table 9—*Investment in Salable Assets, January 1, 1955, December 31, 1955, and December 31, 1956, Pilot Farm¹*

Item	Investment January 1, 1955 ²	Investment December 31, 1955	Investment December 31, 1956
Land and Improvements	\$14,745	\$14,745	\$16,287 ⁴
Buildings	—	14,481	13,759
Fences	—	2,171	2,770
Machinery and equipment	—	2,243	2,624
Livestock	—	393	10,106
Feed and seed	—	2,440 ³	3,203 ⁵
Total	\$14,745	\$36,473	\$48,749

¹Depreciation charges have been deducted.

²121 acres open land valued at \$75 per acre and 189 acres woodland valued at \$30 per acre.

³Includes 1,900 bushels of corn, \$1,900; 5 tons cottonseed, \$375; and purchased feeds on hand, \$165.

⁴Cost of land clearing and pond added to original land value.

⁵Includes 1,700 bushels of corn, \$2,125; 50 tons hay, \$1,000; and purchased feeds on hand, \$78.

Labor Use: Daily labor records show that the operator and the wage hand worked 571 days in 1955, or an average of 285 days per man. The monthly distribution of this labor by jobs is given in Table 10.

In addition to the labor of the wage hand and operator, labor for 17 days of cotton chopping and hoeing was hired during the last week in May, 18 days during the last week in June, and 7 days around July 23. Most of the cotton picking was done by hired labor at the rate of \$2.00 to \$2.50 per hundredweight of cotton picked. Approximately 54 days of hired labor was used for cotton picking in September, and 60 days in October.

Labor requirements on the farm amounted to 571 days of operator and wage hand labor and 156 days of day labor or a total of 727 days of work.

Table 10 — *Days of Wage Hand and Operator Labor Used by Months, and by Jobs, Pilot Farm, 1955 and 1956*

Month	Crops and livestock		New buildings		New fences		Land clearing & fence rows		Miscellaneous		Total	
	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956
Days worked												
Jan.	—	11	13	1	7	26	18	4	6	5	44	47
Feb.	—	42	17	—	18	4	3	—	—	—	38	46
Mar.	3	24	27	—	16	10	3	5	—	12	49	51
Apr.	18	14	19	—	7	6	5	22	—	3	49	45
May	31	40	6	—	7	13	2	—	5	1	51	54
June	9	16	19	—	24	1	—	22	1	9	53	48
July	16	15	22	—	2	—	—	23	6	8	46	46
Aug.	15	14	5	—	10	2	7	26	15	3	52	45
Sept.	40	28	—	—	3	—	3	10	5	2	51	40
Oct.	14	43	33	—	—	—	—	3	1	6	48	52
Nov.	36	14	5	—	7	19	—	—	2	8	50	41
Dec.	8	10	18	—	5	19	—	—	9	9	40	38
Total	190	271	184	1	106	100	41	115	50	66	571	553

Summary of 1955 Operation: In general, the 1955 operations followed the proposed plans. An exception was the delayed seeding of spring pasture, due to the wet spring. As a result, the transfer of beef cattle from the Central Unit to this farm also was delayed. Cash income from crops as well as total farm operating expenses and capital improvements were in line with plans.

Second Year's Operation (1956)

All the land clearing proposed for this farm was completed in early 1956. After land clearing operations were completed, it became evident that approximately 15 to 20 acres around the border of the woods and around some natural waterways should not be planted in row crops because of slope. Some crops such as sericea or fescue and clover should be seeded on waterways and perhaps Kobe lespedeza between the row crop land and the woods. These crops would be used for hay or grazing. Even though land clearing around the borders of fields did not materially increase the row crop acreage, it did remove the shading effect of the woods on the row crop land.

Crops: Details on the planned field arrangements, crops, soil tests, fertilization practices and estimated yields were prepared similar to those given in Table 3 and Figure 3. The varieties and rates and dates of planting various crops were the same as recommended in 1955.



Mr. Wiley L. Land, who was engaged to carry out operations on the Pilot Farm at Ames Plantation, is shown here with Mrs. Land. They were gratified at the growth of upland corn, and cotton, when this picture was made in late July, 1956.

A total of 17.7 acres out of an allotment of 18 acres of cotton was planted in 1956 (Table 4). Cotton was planted during the week of April 25. It was chopped during the first week in May and side-dressed during the second week in June. The dusting program for control of insects was started on June 18 and followed throughout the summer as needed. A total of 1,650 pounds of Toxaphene and BHC was used for insect control during the year. Cotton yields averaged 705 pounds of lint per acre compared with an estimated 575 pounds. Thus actual yields exceeded estimated yields by 130 pounds of lint per acre. The 1956 yield of 705 pounds of lint per acre exceeded the estimated long-time average yield by 80 pounds. The lint yields per acre increased from 345 pounds in 1953 to 608 pounds in 1955, and to 705 pounds in 1956. The total production amounted to 25 500-pound bales in 1956.

A total of 36 acres of upland corn and 9 acres of bottomland corn was planned for 1956. These plans were devolved in Sep-



Raking and baling hay from improved pastures in May, 1956. Yields averaged almost one ton per acre.

tember, 1955, and as previously pointed out, after land clearing operations were completed, the row crop acreage was reduced considerably below the amount shown in the long range plans. As a result, corn acreage in 1956 consisted of 21 acres of upland, and 9 acres of bottomland (Table 4). Corn was planted the last week in April and the first week in May. It was anticipated that corn would yield about 60 bushels on upland and 80 bushels on bottomland, and actual yields were close to these estimates.

The 57 acres of improved pasture for beef cattle which were seeded in September, 1955 were not grazed until May 1. During the last two weeks in May, hay was removed from this pasture as well as the 13 acres in hog pasture. A total of 62 tons of hay was harvested from this pasture area. It was recognized that better quality hay would have been obtained if it had been harvested around May 1; however, due to the urgency of work on cotton and corn it did not seem advisable to do so. Because of a relatively severe drought, very little additional growth was made on these pastures until October.

An additional 27 acres of alfalfa-orchard grass-ladino clover pasture was seeded during the week of October 22, 1956. This was primarily in the newly cleared area which had been summer fallowed. Since there was practically no rainfall in August, September and October, earlier planting would not have produced early fall growth. However, this seeding came through the winter in good condition.

No forestry work was carried out in 1956. Now that most of the improvements have been made on this farm, the farm operator



A group of the first hogs raised on the Pilot Farm in 1956.

and wage hand will have more time to spend in forestry work in future years.

Livestock: It was estimated that each of the 10 brood sows would produce two litters averaging 6 pigs per litter, or a total of 120 pigs in 1956. Actually, 72 hogs were raised from the 10 sows which farrowed in the spring of 1956, and 70 pigs were farrowed in the fall of 1956. Thus, the 1956 pig crop was approximately 20 percent higher than estimated. Sixty-one market hogs were sold in 1956, 30 being sold on August 29 and the others approximately one month later. Four meat hogs were furnished the operator and wage hand. The other hogs from the spring litter were kept for replacement gilts either for this farm or other farms in the area.

Thirty grade Angus cows and their calves and 2 dairy cows and their calves were transferred from the Central Unit of the Ames Plantation to this farm in May, 1956. The beef cattle were valued at \$4,800 and the dairy cattle cost \$230; thus the livestock investment was increased \$5,030 in 1956 by the addition of these animals. Because of a severe drought which practically stopped all growth on the alfalfa-orchard grass-ladino clover and fescue clover pastures in early summer, and the lack of other kinds of summer supplemental grazing crops, these cattle were transferred to a lespedeza pasture on the Central Unit of the Ames Plantation in July. They remained there until October.

Income and Expenses: Total cash income was \$2,025 higher than that estimated for 1956 (Table 6). Crop receipts were approximately \$1,100 higher and livestock receipts were around \$900 more than anticipated. Increased yields plus a higher selling price for lint cotton accounted for most of the additional income from crops. Also, \$347 in cottonseed sales represented inventories held over from the 1955 crop. Approximately two-thirds of the increased livestock receipts were from hogs and the other one-third from cattle.

Total cash income from crops and livestock plus discounts earned was \$7,778 in 1956 compared with an estimated \$5,753 (Table 6).

Non-cash income was \$5,446, or almost twice the \$2,790 estimated. Most of this income was reflected in the fall pig crop which was on hand December 31 plus the increased value of the calf crop above the purchase price of these animals.

Total cash and non-cash income was \$13,224 compared with an estimated \$8,543.

Total cash operating expenses, including the wages of the operator and wage hand, were \$2,855 lower than the estimated \$10,713 (Table 7). These cash expenses were lower than estimated for several reasons. First, the operator and wage hand spent 215 days on fencing and land clearing, and as a result \$1,330 in wages was capitalized into these improvements. Second, fertilizer and seed costs were around \$1,200 lower than estimated because fewer acres of crops were planted; and, according to soil tests, less fertilizer was needed than had been estimated. Third, the cost of rental equipment was below the estimate because a corn picker was not leased as planned. Some costs were higher than estimated. For example, a 5-year policy providing \$12,500 in insurance on buildings was taken out and the 5-year premium of \$368.00 was paid in 1956.

Fertilizer, lime, fuel, purchased feeds and labor were some of the major items of cash cost. A total of 13 tons of mixed fertilizer was used and one ton of 20-percent superphosphate. In addition to this fertilizer, anhydrous ammonia was applied at the rate of 80 pounds per acre to all cotton and corn at a total cost of \$228. Sixty tons of lime was applied in 1956. Fuel and oil used amounted to 1,141 gallons of gasoline and 12 gallons of oil. Feeds purchased for hogs and cattle amounted to 6 tons of soybean meal, 2.5 tons of meat scraps and 1.0 ton of cottonseed meal. A reduction of approximately \$100 in inventories of pur-

chased feeds occurred between January 1, 1956 and December 31, 1956. In addition to the \$2,270 in operator and wage hand labor not capitalized into improvements in 1956, \$811 in day labor was used in chopping and picking cotton.

Non-cash expenses were \$1,603 compared with an estimated \$1,218. Higher depreciation rates on buildings accounted for most of the increase in non-cash expenses. For example, the depreciation rate was 5 percent on the operator's dwelling, wage hand's dwelling, barn, machinery shed, and crib. The depreciation rate was 10 percent on farm machinery and fencing, and 25 percent on the truck. Since a total of \$1,818 in operator and wage hand labor was capitalized into fencing in 1955 and 1956, this would amount to an annual depreciation charge of \$182 per year on labor used in installing new fencing.

Total cash and non-cash expenses were \$9,461 compared with an estimated \$11,931 in 1956.

Net cash income or cash income minus cash expenses was —\$80 compared with an estimated —\$4,960 (Table 6). Thus, the net cash income was \$4,880 higher than estimated.

The actual net farm income was \$3,763 while this income was estimated to be —\$3,388. In other words, the net farm income was slightly over \$7,000 higher than estimated. This was brought about by having approximately \$2,000 more cash income, \$2,600 more in non-cash income (inventory increase) and \$2,400 less in total expenses than was estimated.

Capital Investment: In addition to the \$5,030 in beef and dairy cattle added on this farm in 1956, other farm improvements were added, amounting to \$3,403 (Table 8). This \$3,403 included \$1,330 in farm labor capitalized into fencing, land clearing and farrowing houses.

Approximately 680 rods of 4-strand barbed wire fencing was purchased and installed in 1956. A series of cross fences were built in the cattle pasture area. The pond was added at a cost of \$200.00. Bulldozer work in land clearing amounted to \$880.

Farm machinery and equipment purchases consisted of one farm trailer with tires and tubes, two stock tanks, two hog waterers, two hog feeders, and one sprayer. Cost of these items amounted to \$427.

Total investment in salable assets increased from \$36,473 at the beginning of the year to \$48,749 at the end of the year (Table 9). This represented an increase of \$12,276. This increase in

investment consisted of \$5,030 in livestock purchased; \$3,403 in improvements added; \$4,683 in increased inventories of livestock above purchases; \$763 in increased inventories of feed and seed; minus \$1,603 in total depreciation charges for the year.

Labor Use: The operator and wage hand worked a total of 553 days in 1956 or an average of 276 days per man (Table 10). This labor was used in the following ways: 271 days on crops and livestock, 115 days on land clearing and fence rows, 100 days on fencing, 66 days on miscellaneous jobs, and one day on new buildings. This represents an increase of 81 days spent on crop and livestock work above the amount used in 1955.

Thirty days of cotton chopping labor was hired during the first week in May, 11 days between June 2 and June 22, and 14 days during the first week in July. Hired labor was used to pick 22,496 pounds of seed cotton in September and 6,354 pounds of seed cotton in October. At an estimated picking rate of 200 pounds of seed cotton per day, this represents 112 days of hired labor in September and 32 days in October.

Thus labor requirements on this farm amounted to 553 days of operator and wage hand labor and 199 days of day labor or a total of 752 days in 1956.

Thus labor requirements on this farm amounted to 553 days of operator and wage hand labor and 199 days of day labor or a total of 752 days in 1956.

Summary of 1956 Operation: Most of the land clearing, fencing, buildings and other capital improvements were completed by the end of 1956. During this year beef cattle were added to the farm.

Production rates on both crops and livestock were very favorable. For example, cotton yields exceeded the estimated long-time average of 625 pounds of lint per acre by 80 pounds. The pig crop averaged 20 percent higher than estimated, or slightly exceeded the estimated long-time annual pig crop. Corn yields were close to estimates.

Cash income was \$2,025 higher than estimated and cash expenses were \$2,855 lower than estimated. Part of the decrease in cash expenses was due to capitalizing \$1,330 of farm labor in capital improvement.

Certain weaknesses were also noted in the operation. These were as follows:

1. Because of the erosion hazard on slopes it seemed advisable to reduce the row crop acreage approximately 15 to 20 acres below the amount shown in the long-time plan. This would result in a corresponding reduction in corn acreage, fewer hogs and less cash income.
2. The operator and wage hand spent 215 days' labor on new fencing and land clearing in 1956. With these operations practically completed more crops and livestock are needed to utilize labor more efficiently in future years. Approximately 60 days of labor will be spent in forestry in 1957.
3. Two tractors (John Deere "60's") have been on lease on this farm. It does not seem economical to have two tractors of this size for this operation. One large tractor should be adequate for the row crops on this farm even if the acreage were increased by 25 to 50 acres. A small second-hand tractor may be needed to supplement the large tractor during harvesting operation on corn, hay and silage.
4. Some supplemental summer pasture must be added on this farm to provide grazing from around July 1 through October during the normally hot, dry months.

In the annual planning meeting in the fall of 1956 the Committee discussed the weaknesses as well as the changes which needed to be made on this farm to make the operation more efficient. Two choices confronted the committee. First, one or more intensive crop or livestock enterprises could be added to use the present labor and machinery. Second, the size of the farm (acres) could be expanded and the same farming system maintained. It was decided to add approximately 64 acres to the farm. Thirty acres adjoining the present farm would be added and used for supplemental grazing for beef cattle. Corn would be the major crop grown on the other 34 acres. This would allow some expansion of the hog enterprise. Too, it was decided to purchase one of the leased tractors and a set of equipment and the other tractor would be returned to the machinery dealer.

Third Year's Operation (1957)

The proposed land-use map for 1957 is shown in Figure 4. This shows the original 310 acres plus the adjoining 30-acre tract which has been added to the farm. The 30 acres consist of approximately 50 percent Loring silt loam, eroded undulating phase, and 50 percent Henry silt loam soil. The other 34 acres which

have been added to the farm are located approximately two miles from the present tract and consist of Hymon silt loam soil. It is planned to exchange this land later for about 35 acres of Loring silt loam soil which joins the Pilot Farm.



These two pictures, made from the same location, present a contrast in productivity and land cover. The upper picture was made in March, 1955, and the lower one was made in September, 1957.

Crops: With the addition of 64 acres of land, the cotton acreage was increased from 18 acres to 21 acres in 1957 (Table 4). This cotton was planted on April 27 through April 30. Cotton chopping and hoeing started the first week in June and was completed the last week in June. Approximately 60 days of labor was used in this operation. The cotton insect control program started on July 1 and continued through August.

Corn planting started on April 20 and the last corn was planted on May 7. Ten acres of corn and cane silage was planted (Table 4). This will be stored in a trench silo.

Approximately 25 acres out of the 30 acres of adjoining land which was added to this farm was seeded in Sudan grass for summer supplemental grazing for beef cattle. This was seeded on June 21 and was fertilized with 100 pounds of 48% super phosphate and 60 pounds of nitrogen in the form of anhydrous ammonia. Cattle were turned on the Sudan grass on August 1 and they stayed until September 2. Rainfall was ample for good growth on the Sudan grass but rust damage was great. Around 5 acres out of the 30 acre tract will be cleared this year. It was planned to seed or sprig about 15 acres of this total tract in Bermuda grass and use the other 15 acres for Sudan. Due to the wet spring the clearing could not be completed and the Bermuda grass could not be seeded or sprigged.

Approximately 35 acres of the alfalfa-orchard grass-ladino clover and fescue-ladino clover pasture was fertilized at the rate of 100 pounds per acre of ammonium nitrate between March 18 and April 18. A total of 52 tons of hay was harvested from the 97 acres of permanent pasture between May 24 and May 30.

This year the operator and wage hand did some work in forestry. They planted 7,800 pines in an open field in the long-time woodland area. Too, they cut 16,376 feet of logs off the wooded area added to the farm. They were paid \$6.50 per 1,000 for pine planting, \$5 per 1,000 feet for felling and bucking, and \$2.00 per 1,000 feet for skidding logs.

Livestock: A total of 83 pigs were farrowed from the 10 sows in the spring of 1957. Fifty-five hogs were sold from the 1956 fall pig crop. Thirty were sold the last week in February and 20 the third week of March. The other hogs were held as replacement gilts for this farm or some of the adjoining farms.

Since the total supply of corn was less than the amount required to feed out the hogs and beef cattle, it was decided to



Some of the grade Angus cattle are shown here on improved pastures in September, 1957.

sell most of the heifers and steers early in 1957. Six steers averaging 566 pounds each were sold on February 14, for 18 cents per pound. On the same date, 9 heifers averaging 637 pounds each were sold at 17 cents per pound. Six other steers were fed out and sold on June 18 at an average weight of 810 pounds. These steers brought 22.5 cents per pound. Two cows were sold from the herd before July 1.

Twenty-seven beef calves were born in the early spring. Grazing conditions were favorable enough this spring and summer that the 27 beef cows and their calves and 2 milk cows were grazed on the alfalfa-orchard grass-ladino clover and fescue-ladino clover pastures until August 1 before being moved to the Sudan grass pasture. Last year these cattle had to be moved off the so-called "permanent pastures" around July 1 because of drought.

Income and Expenses: Total cash income was estimated at \$11,048 for 1957 (Table 6). By June 30 cash income amounted to \$5,446 or approximately one-half the estimated total. This income consisted of cattle sales \$2,970; hogs, \$2,311; and forestry, \$165. With present income prospects from hogs and cotton the actual cash income should exceed the estimated cash income by \$1,000 to \$2,000.

Total cash operating expenses were estimated about \$11,036 in 1957 (Table 7). These expenses amounted to only \$3,793 through June 30. Therefore, expenses were well within the budget at that time.

Capital Investments: A John Deere "60" tractor, 1 cultivator 1 tiller, 1 disk harrow and 1 planter and fertilizer attachments were purchased in March. The cost of this tractor and equipment was \$2,265. In May a cultipacker was purchased for \$255. Thus a total of \$2,520 was spent on machinery and equipment through June 30.

It is anticipated that a mower and rake will be purchased next year. Thus far the use of a mower and rake has been obtained through the exchange of work with another farm.

Discussion and Evaluation

The experiences gained on this farm have been observed closely by farmers, credit agencies and agricultural workers throughout the cotton section of the Southeast. A great deal has been learned by the various specialists of the University who have worked on the planning and operational phases of this farm. The importance of the "farm approach" as well as the "enterprise approach" in planning has been demonstrated.

Crop and Livestock Organization: The land-use program proposed in 1954 and 1955 had to be altered to some extent because of the erosion problem around the ridges. At this stage, cotton is the major crop where the actual yield has exceeded the estimated average long-time yield. This occurred in 1956, and present prospects look favorable for exceeding the estimated long-time yield of 625 pounds of lint per acre in 1957. Corn yields on this Pilot Farm have been slightly more than double the 26 bushels per acre obtained on this land before this farm was set up. However, yields during the first two years were approximately 10 to 20 bushels per acre less than the estimated long-time yields. Present prospects indicate that 1957 yields may closely approximate long-time yields.

The balance between forage production and beef cattle numbers has not been determined on this farm at present. For example the summer of 1956 was extremely dry and the so-called "permanent pastures" were parched by July 1. In 1957 rainfall has been heavy and permanent pastures still have some carrying capacity (September 1). Too, all the permanent pastures are under two years old and the length of life of these pasture stands has not been determined. The stand in the pastures established in the fall of 1955 is still relatively good. It does seem advisable to have some summer supplemental grazing crops. It is believed



Many different groups representing varied interests have visited the Ames Plantation Pilot Farm since its establishment. This picture shows part of the group that visited the farm for the annual Livestock Field Day in the Fall of 1956.

that the present acreage of permanent pasture plus the summer grazing crops and corn and cane silage will adequately support the 36 beef cows set up in the long-time plan.

The number of pigs farrowed and raised per sow has been equal to the estimates made in the long-time plan. The size of the swine enterprise is dependent upon the corn crop produced.

Income and Expenses: This farm has not been in operation long enough to evaluate fully the accuracy of the long-time estimates of income and expenses. It seems advisable to increase the beef cattle numbers gradually over the next 3 to 5 years in order to seek a balance between cattle numbers and forage production rather than to transfer 6 to 10 more brood cows to this farm immediately. This will mean a 3 to 5 year period before income from beef cattle will be as high as estimated in the long-time plan. On the other hand, certain expenses such as building, fencing, and machinery repairs may be lower than estimated in the long-time plan because these improvements are relatively new. In future years most of the labor will be charged to current operating expenses rather than capitalized into improvements since practically all permanent improvements have been made.

Offsetting this is the fact that the present labor force is working a greater acreage than originally planned. When all these factors are considered it does not seem advisable at this time to make any major changes in the long-time estimates on income and expenses.

Financing the Farm

Returns on Investment and Labor on this Farm in 1953: The investment in the 310-acre farm before it was converted to a Pilot Farm was estimated to be \$14,745. In 1953 the rent paid for the use of this farm amounted to \$680 (Appendix Table 4). After deducting \$200 for taxes, insurance and general repairs the Plantation received a total of \$480 in returns on \$14,745, or 3.3 percent on investment.

During 1953 net cash farm income amounted to \$1,795 for the two full-time workers on this farm, or \$898 per man. Net farm income totalled \$995, or \$498 per man. The farm family was very poorly housed and there were practically no storage facilities.

Thus, this system of farming was based on a low return on capital investment and labor. It is doubtful whether this system of farming could continue for a very long period.

Financing Viewed as a Long-Time Investment: The goal of most farmers in the past has been to own their farm free of debt. Because of the increasing demand for capital in agriculture this may not be the most realistic goal in future years if it means that the farm family accepts a lower level of living during the debt repayment period than it would have in other employment.

Most industries obtain a major share of their capital for expansion and in many instances operating expenses through the use of outside capital rather than current earnings. This capital may be obtained through the sale of stocks and bonds or other forms of securities where the primary concern of the lender or investor is to obtain a return on funds invested. In the future both the farm family and the creditor may find it advisable to view agricultural credit as a long-time investment which may not be repaid in full within one generation.

It was recognized when the Pilot Farm was set up that conventional methods of financing would not be adequate to carry out the planned adjustments. Therefore the Will Trustees of

the Hobart Ames Foundation agreed to advance up to \$50,000 in cash to develop this farm. They had two reasons for advancing this capital. First, the Planning Committee thought that the Will Trustees would receive at least 4 percent on their investment and this rate of return was comparable to returns they were receiving from other funds invested. Second, since both the Ames Plantation and the Trust Fund left in Mrs. Ames' Will were to be used solely for research and educational purposes by the College of Agriculture of the University of Tennessee the advancement of these funds seemed justified on this basis.

The Will Trustees advanced \$38,800 in cash between January 1955, and August, 1956, for developing this farm in addition to the estimated \$14,745 original investment in land. Also, as previously mentioned, \$4,800 worth of beef cattle was transferred to this farm. The total capital resources invested on this farm at different time periods were \$58,345 (Table 11). The total resources estimated to be invested in this farm, exclusive of land, are indicated in Table 2.

Table 11 — *Schedule of Capital Resources Invested in the Pilot Farm January 1, 1955, through June 30, 1957*

Time Period	Land	All buildings	Fencing, farm machinery and improvements		Livestock	Operating funds	Total
Beginning 1955	\$14,745	—	—	—	—	—	\$14,745
Jan. - June 1955	—	\$ 6,824	\$ 2,060	—	\$ 4,805	—	13,689
July - Dec. 1955	—	7,434	3,464	\$ 393	2,290	—	13,581
Jan. - June 1956	—	48	341	5,030	2,111	—	7,530
July - Dec. 1956	—	—	3,014	—	3,266	—	6,280
Jan. - June 1957	—	—	2,520	—	—	—	2,520
Total	\$14,745	\$14,306	\$11,399	\$5,423	\$12,472	—	\$58,345

The \$58,345 invested in this farm at present does not represent the long-time or average investment. For example all the buildings, fences, farm machinery and improvements are new. Assuming fences, farm machinery and improvements last 10 years, then \$1,140 of the \$11,399 invested in these items would be returned to the creditor each year as depreciation. This would mean that the creditor would have one-half of this initial investment or \$5,700 invested in these items over time. Similarly the long-time average investment in buildings would be \$7,153. Thus, the average investment of the creditor would be \$14,745 in land, \$7,153 in buildings, \$5,700 in fencing, farm machinery and improve-

ments, \$5,423 in livestock and \$12,472 in operating funds or a total of \$45,493.

If we assume that the primary aim of the creditor is to receive interest on his funds invested rather than a repayment of capital then he would receive \$2,219 annually on the \$45,493. This represents a return of 4.88 percent on investment. The \$2,219 is the net farm income available for interest payment in this particular case (Table 6).

One of the important questions raised by creditors as well as by farmers is: What return can we get from the new investments planned? In the case of the Pilot Farm \$38,800 in cash and \$4,800 in livestock have been transferred to this farm since 1955 or a total of \$43,600. This would amount to a long-time average investment of \$7,153 in buildings, \$5,700 in fencing, farm machinery and improvements, \$5,423 in livestock and \$12,472 in operating funds or a total of \$30,748. If \$480 (return on investment in land in 1953) were deducted from the \$2,219 available for interest payment, then \$1,739 in interest payment or 5.6 percent could be paid on the average investment of \$30,748.

One important consideration which should be noted by both the creditor and the farmer is the change in the status of the families of the operator and wage hand now compared with the operator's family level before 1955. Where the net cash income per worker was less than \$500 prior to 1955, it is now approximately \$1,800 under this plan. Besides, the present workers have good houses, two hogs furnished per worker, an adequate milk supply, and garden.

Financing Viewed as a Long-Time Repayment of Capital: As previously pointed out, the long-time average investment of the creditor in this farm is \$45,493 instead of the \$58,345 current investment. If the \$45,493 average investment were repaid over a 40-year period at 4 percent interest, the annual repayment on the debt would be \$2,322. This would be \$103 more than the \$2,219 which is available, for debt repayment according to the long-time plan. However, income for debt repayment as shown in this plan only included \$150 annually in forestry receipts. According to Table 1, forestry receipts under intensive management would increase until in the third decade they would range from \$495 to \$1,579 annually, depending upon the method of harvesting. Similarly, by the fourth decade these receipts would range from \$1,055 to \$1,671 annually. Thus this estimated long-

time income from forestry would more than make the difference (\$103) in the amount of money available for debt repayment and the amount needed for debt repayment.

As pointed out previously, one of the objectives in setting up this Pilot Farm was to see how quickly a cotton farm could be converted to a cotton-hog-beef-forestry system of farming with adequate capital. Ordinarily the shift to another system of farming will be made gradually over a period of years.

The average owner-operator has some usable buildings, fences and farm machinery on hand. Too, he normally has some feed and livestock and is willing to work for a lower wage during the early stages of developing his farm if he has some prospect of higher income in the immediate future.

For example, assume that an owner-operator has a farm with approximately the same labor and land resources, and he desires to develop about the same type of farming as that on the Pilot Farm. Further assume that he will need 50 percent of the amount of capital invested in buildings, fences, farm machinery and livestock and 33 percent of the operating funds used on the Pilot Farm to develop his farm over a 5-year period. This means that the operator would need \$7,153 for buildings, \$5,700 for fences and farm machinery, \$2,712 for livestock purchases and \$4,157 for operating funds or a total of \$19,722. The operating funds would be used to increase fertilization, lime the soils, buy better seed and pay other operating costs associated with higher production. Only interest will be paid on borrowed funds during the first three years after they are obtained. If the building funds are repaid over a 40-year period and other funds over a 10-year period at 5 percent interest, then the annual payment on this loan would be \$1,408 plus the annual depreciation charges of \$749 which would be returned to the creditor each year. If the income and expenses on this farm at the end of 5 years were similar to the long-time estimates on the Pilot Farm, then the money available for debt repayment and depreciation charges would be around \$3,900 annually, excluding the \$2,400 used for living expenses by the operator and his family.

This is just one example to indicate how experience gained on the Pilot Farm might be used on other farms. In all instances, the method of financing farm adjustments must be tailored to the farmer's resources, his likes and dislikes, and the sources of credit available.

APPENDIX A

Table 1—*Land Use and Crop Yields Under Existing and Alternative Plans, Pilot Farm*

Land use	Existing plan 1953		Plan I		Plan II	
	Acres	Yield per acre	Acres ¹	Yield per acre	Acres ¹	Yield per acre
Cotton	32	344# lint	25	625# lint	20	625# lint
Corn, upland	19	26 bu.	36	70 bu.	—	—
Corn, bottomland	—	—	9	100 bu.	9	100 bu.
Corn & cane silage	—	—	10	12 T.	10	12 T.
Soybean hay	—	—	6	1 T.	—	—
Soybeans for beans	—	—	—	—	30	20 bu.
Oats	—	—	—	—	(30)	55 bu.
Lespedeza	35	failed	6	grazed	—	—
Alfalfa & orchard grass	—	—	12	3.5 T.	16	3.5 T.
Oats & crimson clover	—	—	(10)	grazed	(30)	grazed
Button clover	—	—	(25)	grazed	—	—
Bermuda grass & clover pasture	—	—	23	grazed	30	grazed
Alfalfa-orchard grass pasture	—	—	50	grazed	60	grazed
Unimproved pasture	35	grazed	—	—	—	—
Woodland	189	—	133	—	135	—
Total acres	310	—	310	—	310	—

¹Double cropping indicated by ().

Appendix A, Continued

Table 2—*Number and Kind of Livestock Under Existing and Alternative Plans, Pilot Farm*

Kind of livestock	Existing plan 1953	Plan I	Plan II
	Number of livestock		
Milk cows	—	2	2
Beef cows	5	36	45
Bulls	1	2	2
Calves born	4	34	42
Veal calves	1	2	2
Yearling heifers	3	16	20
Yearling steers	—	16	20
Brood sows	1	10	—
Boars	—	1	—
Hogs raised	8	140	—

Appendix A, Continued

Table 3—*Estimated Gross Cash and Non-cash Income and Net Farm Income Under Existing and Alternative Plans, Pilot Farm*

Item	Existing plan 1953	Plan I	Plan II
Cash Income:			
Cotton, lint	\$ 3,490	\$ 4,688	\$ 3,750
Cottonseed	550	780	624
Oats	—	—	1,590
Soybeans	—	—	1,462
Forestry	—	150	150
Total cash income, crops	4,040	5,618	7,576
Cows	—	450	625
Veal calves	—	88	88
Yearling heifers	—	1,800	2,250
Yearling steers	—	3,040	3,800
Hogs	400	5,454	—
Total cash income, livestock	400	10,832	6,763
Total cash income crops & livestock	4,440	16,450	14,339
Net cash farm income:			
(cash income minus cash expenses)	1,795	6,546	5,765
Net farm income:			
(total income minus total expenses)	995	4,619	3,737
Less wages farm operator	—	2,400	2,400
Net returns to capital	—	2,219	1,337
Average investment	\$14,745	\$41,465	\$42,469

Appendix A, Continued

Table 4—*Estimated Cash and Non-Cash Expenses Under Existing and Alternative Plans, Pilot Farm*

Item	Existing plan 1953	Plan I	Plan II
Cash expenses:			
Fertilizer & lime	\$ 188	\$ 3,001	\$ 2,724
Seed	115	606	676
Poison	200	140	112
Ginning	187	264	213
Cottonseed meal	—	238	317
Tankage	—	525	—
Soybean meal	—	385	—
Veterinary & medicine	—	225	94
Auction fees	—	118	63
Miscellaneous livestock	115	134	130
Fuel, grease & oil	400	417	548
Truck or auto hired	200	175	175
Machinery repairs	300	310	341
Bldg. & fencing repairs	—	400	359
Day labor—cotton & corn	260	1,116	972
Hired hand	—	1,500	1,500
Taxes, insurance	—	150	150
Miscellaneous	680(rent)	200	200
Total cash expenses	2,645	9,904 ¹	8,574 ¹
Non-cash expenses:			
Depreciation:			
Machinery	800	1,238	1,366
Buildings and fences	—	449	393
Death losses:			
Livestock	—	240	269
Total non-cash expenses	800	1,927	2,028
Total cash and non-cash expenses	\$ 3,445	\$11,831 ¹	\$10,602 ¹

¹Excludes wages of farm operator but includes wages of hired hand.

APPENDIX B**AGREEMENT WITH REFERENCE TO
OPERATION OF PULLIAM TRACT**

THIS AGREEMENT, Made and entered into in duplicate on this _____ day of _____, 195____, by and between the **TRUSTEES OF HOBART AMES FOUNDATION**, hereinafter called the parties of the first part, and _____, hereinafter called the party of the second part,

WITNESSETH:

WHEREAS, Julia C. Ames, by her last will and testament, created the Hobart Ames Foundation for scientific and educational purposes, and directed that the facilities of the Ames Plantation should be available to the College of Agriculture of the University of Tennessee for such scientific and educational purposes as such College of Agriculture might be lawfully authorized to pursue; and

WHEREAS, The College of Agriculture of the University of Tennessee has requested that the parties of the first part devote a certain portion of the Ames Plantation to the operation of a demonstration farm, hereinafter called the farm unit, for the carrying out of the experiments and investigations, and has requested the parties of the first part to supply the required land and certain funds necessary in order that said demonstration farm may be properly begun and conducted;

NOW, THEREFORE, It is by the parties agreed as follows:

I.

The parties of the first part, in consideration of the agreements of the party of the second part herein contained, do hereby employ the party of the second part to occupy and operate, for the period hereinafter specified and upon the terms and conditions hereinafter contained, that portion of the Ames Plantation commonly known as the Pulliam Tract, said tract containing approximately 310 acres of land and being located in Hardeman County, Tennessee, and the party of the second part agrees to occupy and operate said tract for the time and upon the conditions hereinafter set out.

II.

The original term of this contract shall be the period from January 1, 1955, to December 31, 1955, and this contract shall continue in full force and effect from year to year thereafter unless either party signifies his desire to terminate this contract on the 31st day of December by written notice given to the other party not later than September 30th immediately preceding the date of such desired termination, it being, however, further expressly agreed and understood that this contract may be terminated by the parties of the first part at any time if the party of the second part shall fail or refuse to carry out any of the terms and conditions of this contract undertaken by such party of the second part, after the party of the second part shall have been given thirty (30) days written notice setting forth such default and shall have failed and neglected to cure such default within such thirty-day period.

James M. Bryan, Assistant Manager of the Ames Plantation, has been duly appointed as the representative of the parties of the first part on the Pulliam Farm Unit Committee referred to in Article III hereof. In this capacity as said representative, any determination by James M. Bryan that a default on the part of the party of the second part exists shall be conclusive, and in the event that any other person shall be duly designated in lieu of said James M. Bryan, the determination of such successor shall be conclusive with respect to such default.

III.

The party of the second part specifically agrees that, during the existence of this contract, the program of land use, including but not being limited to, the crops grown, the use of all pasture land, the forest management program, and the livestock program, will be that program designated by the Pulliam Farm Unit Committee appointed by the University of Tennessee and James M. Bryan, Assistant Manager of the Ames Plantation, or his successor.

Detailed programs for each phase of the operation, including crops to be grown and location thereof, the cropping practices to be followed, the farm management practices, the number and kinds of livestock, the livestock programs to be followed, and other programs of like nature, will be furnished to the party of the second part at the proper season, and the failure of the party of the second part diligently to attempt to put into operation any

such designated practices shall constitute a default on his part in the performance of the provisions of this contract.

IV.

The parties of the first part agree as follows:

(a) To furnish the lands above mentioned and such improvements as it shall determine to be proper;

(b) To furnish all machinery, equipment, livestock, feed, seed, fertilizer, insecticides and other supplies as it may deem proper, and to pay all expenses incurred in the operation of the farm unit, it being understood that in the event that the farm unit should require the use of additional equipment, such as machinery for baling, mechanical harvesting of cotton, and operations of like nature, the parties of the first part will furnish such additional machinery as may be reasonably required, provided such additional machinery can be furnished without damage to other operations of the Ames Plantation, and the farm unit operations shall be charged at the then going rate for particular kind of custom work required by the farm unit;

(c) To provide labor and materials for making all major improvements and major repairs and for the construction of such new buildings and fences, and materials for minor repairs and minor improvements of buildings and fences as from time to time may, in the discretion of the parties of the first part, be deemed necessary and proper.

V.

The party of the second part agrees:

(a) To devote his full time and labor during the period of this contract to the operation of the farm unit, and to do all work necessary to carry out in detail the operation of said unit;

(b) To operate the farm unit in a husbandlike manner, and make all minor repairs to the buildings and fences and to the machinery and equipment;

(c) To follow all prescribed practices with respect to the maintenance of terraces, waterways and other conservation practices;

(d) To follow all prescribed cropping and pasture practices with respect to plowing, planting, cultivating, harvesting, use of

fertilizer, insecticides and fungicides, and any other designated practices;

(e) To follow all prescribed forest management practices;

(f) To follow all prescribed practices in the feeding, breeding, care, management and sale of livestock;

(g) To keep all records concerning operation of the farm unit which may be required by the Pulliam Farm Committee;

(h) To keep the farm unit neat and attractive, and to keep cut all weeds and noxious grasses in lots and fence rows;

(i) To provide seed and labor for the garden, and to set and to tend all orchard plants and ornamental plants which may be prescribed;

(j) At the termination of this agreement, whether by lapse of time or in the manner above provided, to deliver the farm unit and all properties belonging to the parties of the first part to the parties of the first part in good order, repair and condition, reasonable wear and tear excepted.

VI.

The parties of the first part shall pay to the party of the second part, so long as this agreement shall remain in full force and effect, the sum of Two Hundred Dollars (\$200.00) per month, such sum to be payable on the last day of each month during such period.

In case the party of the second part shall at any time during the existence of this agreement be incapacitated to the extent that it is necessary that someone be employed to perform that work which the party of the second part should have done had he not been so incapacitated, the cost of such employment of such third person or persons shall be deducted from the said sum of \$200.00 per month.

At the end of each contract year, provided that the employment of the party of the second part shall have continued for said entire yearly period, the net farm income, as hereinafter defined, shall be divided as follows: the first One Thousand Dollars (\$1,000.00) of such net farm income shall be divided equally between the parties; the next One Thousand Dollars (\$1,000.00) of net farm income shall be divided sixty percent (60%) to the party of the second part and forty percent (40%) to the parties of the first part; the next One Thousand Dollars (\$1,000.00) of

net farm income shall be divided seventy percent (70%) to the party of the second part and thirty percent (30%) to the parties of the first part; the remainder of such net farm income shall be divided seventy-five percent (75%) to the party of the second part and twenty-five percent (25%) to the parties of the first part.

The method of computation of the net farm income as heretofore used in this paragraph shall be as follows:

The net farm income shall be determined by adding all farm receipts obtained from the farm unit and subtracting therefrom the sum of all farm expenses and the other items hereinafter set out. Complete and accurate records of gross farm receipts and farm expenses shall be kept by the party of the second part, said records so maintained by the party of the second part will be audited by M. O. Carter Company or such other auditing firm as may be employed by the parties of the first part. Said audit will be made annually as of the last day of February and the determination of net earnings as set forth in this article shall be as of that date.

Such gross receipts shall include all receipts from the sale of crops, livestock and livestock products, except that in the case breeding animals are sold, the receipts from the sale of such animals shall not be included in the gross farm income, but only that portion of such receipts as shall be allotted to farm income, if any, shall be determined by the Pulliam Farm Committee. The receipts from the sale of forest products will not be included in the gross farm income, but that portion of such receipts as shall be allotted to farm income, if any, shall be determined by the Pulliam Farm Unit Committee.

The farm expenses shall include:

(a) The sum of Two Thousand Four Hundred Dollars (\$2,400.00) or four percent (4%) of all amounts which shall be expended by the parties of the first part as capital investment, whichever of said sums is the greater (which amount shall be refunded to the parties of the first part);

(b) All sums paid to the party of the second part as salary as above set out;

(c) Annual depreciation on machinery and fencing, calculated at ten percent (10%) of the purchase price;

(d) Annual depreciation on buildings, which depreciation shall, however, in no event exceed five percent (5%) of the construction cost of such buildings;

(e) All sums otherwise expended in the operation and maintenance of said farm unit.

VII.

All cash receipts resulting from the farm unit shall be deposited in a special checking account known as "Ames Plantation-Pulliam Tract" or some other appropriate name, and all expenses of the farm operation shall be paid from said account. Only James M. Bryan or his successor as representative of the parties of the first part shall have authority to sign checks drawn on this account.

Expenses for telephone, electricity and fuel for the household shall be paid by the party of the second part.

VIII.

The parties of the first part, the Pulliam Farm Unit Committee and James M. Bryan, or his successor, shall at all times have the right of entry upon and to said farm unit for any purpose not inconsistent with the rights of the party of the second part. The party of the second part shall have the right to use, without being charged therefor, two (2) meat hogs, one (1) milch cow and not more than fifty (50) head of poultry annually for family use.

IX.

The importance of the farmer's wife toward the success of the operation of a farm unit is recognized by both parties, and it is specifically understood and agreed that the wife of the party of the second part shall not have any regular employment except that of housewife.

X.

The party of the second part shall in no event be construed to be the agent of the parties of the first part, and the parties of the first part shall in no manner whatsoever be liable for any expenditures made by the party of the second part without written authorization to do so given to him by James M. Bryan or his successor.

Title to said land, improvements, machinery, livestock and other capital assets furnished by the parties of the first part shall at all times remain in the parties of the first part.

IN WITNESS WHEREOF, the parties hereto do hereunto set their signatures on the day and year first above written.

OLD COLONY TRUST COMPANY

By _____

Trustees of Hobart Ames Foundation
Parties of First Part

THE UNIVERSITY OF TENNESSEE
AGRICULTURAL EXPERIMENT STATION
KNOXVILLE, TENNESSEE

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Experiment Farms

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