Cotton Growing

in

SOUTHEASTERN OKLAHOMA

A Comparison of Present Methods and Recommended Practices

OKLAHOMA AGRICULTURAL EXPERIMENT STATION
in cooperation with
UNITED STATES DEPARTMENT OF AGRICULTURE

Bulletin No. B-358 September, 1950

SCORE CARD

for

Southeastern Oklahoma

COTTON PRODUCTION PRACTICES

How to Use the Score Card

The use of a scoring system will point up strong and weak points in cotton practices and provide a guide for improvement. It will not furnish an easy solution to the problems of cotton growing. Too much depends on weather and other factors beyond the individual farmer's control.

The way cotton is grown on an individual farm may be evaluated by use of the scoring system presented here, by making adaptations to individual farm conditions.

The fertilization score should not be marked down on farms where soil tests show that fertilizer is not needed. Nor will insect control be needed to the same extent on every farm in every year. Land preparation and cultivation operations need to be evaluated from the standpoint of prior crops and type of soil. Man labor requirements for individual farms may be computed from the farmer's own estimates by operations performed, or from the averages (per acre covered) presented in Appendix Tables 6 and 7 of the Oklahoma Agricultural Experiment Station Bulletin No. B-358. Computed labor requirements may then be compared with lowest probable labor requirements using tractor equipment (see Table 8, Bulletin No. B-358). However, proper adjustment in harvest labor requirements in both instances must be made to fit actual yields.

There are other factors in successful cotton production which are even more difficult to measure than the ones considered. For example rotation of cotton with other crops will aid in controlling insect and plant diseases and reducing soil erosion. In addition, a legume crop in rotation will help to maintain organic matter and nitrogen and improve physical condition of the soil.

SCORE CARD

for

Cotton Production Practices in Southeastern Oklahoma

Item	Possible Score	Your Farm
Seed and Seeding Rate (20 points)		
Variety	10	
Rate of Seeding	5	
Method of planting and spacing	5	
Method and Time of Harvesting (10 points)	10	
Land Preparation and Cultivation (20 points)		
Kind of operations	10	
Timeliness of operations	10	
Fertilization (10 points)	10	
Insect Control (20 points)	20	
Labor Requirements (20 points)		
Compared with lowest probable for each power group (horse or tractor) according to importance	10	
Compared with lowest probable using tractor power	10	
TOTAL SCORE	100	

The possible score is based on Experiment Station recommendations and evaluation of information obtained from farmers. Details of how to score the cotton enterprise are presented in Oklahoma Agricultural Experiment Station Bulletin No. B-358.

OKLAHOMA AGRICULTURAL EXPERIMENT STATION
Oklahoma A. & M. College, Stillwater
W. L. Blizzard, Director Louis E. Hawkins, Vice Director

in cooperation with

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics

9-50—4½M

What It's All About . . .

Managing a cotton farm to provide a desirable living and an income on investment, and at the same time maintain soil fertility, has been difficult—probably more difficult than for any other important type of farm in Oklahoma. Reduced acreages and low per acre yields point up the problem.

Yet cotton remains an important source of income to many Oklahoma farm families, and to the State's economy generally. New production methods are appearing which promise to aid cotton in finding a stable place in Oklahoma agriculture. Therefore, research was undertaken to determine the probable value of various new methods as compared to older ways of growing cotton. This bulletin summarizes the results of that research.

The information presented here was obtained by asking almost one hundred representative southeastern Oklahoma cotton farmers how they grew cotton. Each farm was visited personally, and considerable time was spent in getting complete details as to the methods used by each farm operator. These reports were then compared with experiment station recommendations, which are based on field tests made by station research workers, and on observation of methods that give good results on farms.

Finally, the knowledge obtained was summarized in score card form, to enable an individual cotton grower to compare his methods with those of others to see in what ways he might save work, increase net income or both. The score card is given on page 8, and page 8 tells in brief how to use it. Remainder of the publication gives additional information useful in scoring a farm, and in comparing it with other farms in the area.

A general summary of results of the study is given in Table 2 and under the heading "Highlights of the Results" on page 6.

Similar studies have been made of cotton-growing areas in eastern and southwestern Oklahoma. Reports on the eastern Oklahoma area and the southwestern area have been publishd as Okla. Agri. Exp. Sta. Bul. No. B-345, "Cotton Growing in Eastern Oklahoma," and Okla. Agri. Exp. Sta. Bul. No. B-350, "Cotton Growing in Southwestern Oklahoma."

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Appendix Tables

Cotton Growing in Southeastern Oklahoma

A Comparison of Present Methods and Recommended Practices

By WILLIAM F. LAGRONE*
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Cotton is the principal cash crop on many farms in the four Red River counties of southeastern Oklahoma, Marshall, Bryan, Choctaw, and McCurtain (Figure 1). Varying soil conditions, including coastal plain, cross timbers, black waxy, and alluvial, have contributed to peanut production and general farming as well as to cotton growing. Southeastern Oklahoma is one of the oldest cotton sections of the state, and in 1944, 47 percent of the farms in the area were dependent on cotton for a major share of cash income.

Cotton acreage has consistently declined, the 1943-47 average acreage for the area was only 30 percent of the 1928-32 average (Table 1). Soil erosion, fertility depletion, insect hazards, high labor costs, cotton adjustment programs, and development of other crop and livestock enterprises, have all contributed to the drastic decline in cotton acreage. The low average per acre yields, associated with extensive cotton planting on eroded and low fertility soils, point up some of the critical problems facing southeastern Oklahoma farmers in maintaining farm incomes and improving soil resources.

With the foregoing considerations in mind, a study of cotton growing methods was begun in the summer of 1948 with a field survey in the four counties of the area: Marshall, Bryan, Choctaw, and McCurtain. The broad objectives of this study were:

(1) To provide a current picture of production practices of cotton and other major crops;

(2) To ascertain the variation in use of fertilizer, insecticides, and other improved practices, and in degree of mechanization; and

(3) To evaluate the economic significance of these production practices and techniques.

This publication describes current methods of growing cotton, presents the variation in these methods, and compares present practices with experiment station recommendations. It also suggests a method of scoring present cotton production practices on individual farms.

* Stationed at Stillwater, Oklahoma, with the Department of Agricultural Economics, Oklahoma Agricultural Experiment Station. This publication is based partly on an analysis of data obtained in a study of cotton growing methods conducted by the Bureau of Agricultural Economics in cooperation with Southern agricultural experiment stations. E. Lee Langsford, BAE, provides national leadership of the project; and Dr. Peter Nelson, Head, Department of Agricultural Economics, Oklahoma Agricultural Experiment Station, is general supervisor of the work in Oklahoma. In addition to the suggestions and helpful criticisms of the above in the planning and analysis of this study, other members of the Department of Agricultural Economics at Oklahoma A. & M. College also helped with the manuscript review, and Ada B. Eden furnished material assistance in assembling, summarizing and checking the data. Valuable aid given by production specialists in the Experiment Station and the Oklahoma Agricultural Extension Service is acknowledged on page 13.

Highlights of the Results

Composite scores for the farms visited in making this study are given in Table 2. In general, farmers were close to experiment station recommendations on planting seed and seeding rates, timeliness of operations, and method and time of harvesting. They were far short of recommendations with respect to fertilization and insect control.

Out of a possible score of 100, small farms had a score of 59, medium farms a score of 66, and large farms a score of 76. The higher score for the large farms was due principally to three factors: (1) better insect control, (2) good land preparation and cultivation, and (3) low labor requirements per acre and per pound of cotton produced. The high scores for the last two items were due to widespread use of tractors on the large farms.

Small farms received highest score for only method and time of harvesting. The small size of these farms has influenced considerably the type of production practices followed, as well as farm income.

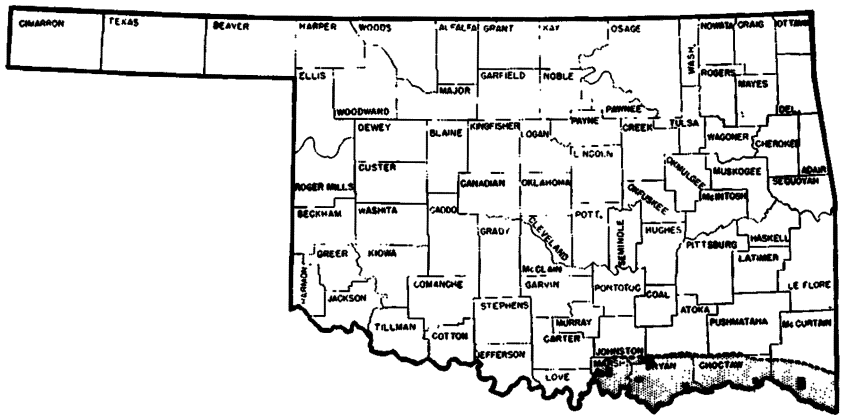

Fig. 1.—Data on cotton growing practices in southeastern Oklahoma were obtained in the area indicated on the map. Major sample areas (black squares) are also shown.

Table 1.—Estimated Cotton Acreage, Production, and Yield Per Acre Oklahoma and Southeastern Oklahoma, Selected Periods

Item	Yearly Periods				Changes 1943-47 From	
	Average 1928-32	Average 1935-39	Average 1943-47	1948	1928-32	1935-39
Oklahoma						
Acreage (Thousand Acres)	3804	2197	1298	1069	−2506	−899
Prod. (Thousand Bales)	1109	544	379	374	− 730	−165
Yield (Lbs.)*	139	118	140	168	+ 1	+ 22
Southeastern Oklahoma						
Acreage (Thousand Acres)	215	130	64	74	151	66
Prod. (Thousand Acres)	54	37	18	18	− 36	− 19
Yield (Lbs.)*	120	134	136	116	+ 16	+ 2

* Yield per acre in cultivation July 1.

Table 2.—Composite Scores for Present Cotton Production Practices on Farms, Southeastern Oklahoma, 1947.

Item	Possible Score*	Small Farms	Medium Farms	Large Farms
Seed and Seeding Rate (20 points)				
Variety	10	7	8	9
Rate of Seeding	5	5	5	5
Method of planting and spacing	5	5	5	5
Fertilization (10 points)	10	3	4	4
Insect Control (20 points)	20	1	2	9
Land Preparation and Cultivation (20 points)				
Kind of Operations	10	8	9	9
Timeliness of Operations	10	9	9	10
Method and time of harvesting (10 points)	10	9	8	7
Labor Requirements (20 points)				
Compared with lowest probable for each power group (horse or tractor) according to importance	10	7	9	9
Compared with lowest probable using tractor power	10	5	7	9
Total Score	100	59	66	76

* The possible score is based on Experiment Station recommendations and evaluation of information obtained from farmers. The method of rating cotton practices is discussed in detail on pages 13 to 25.

How To Use The Score Card

The use of a scoring system will point up strong and weak points in cotton practices and provide a guide for improvement. It will not furnish an easy solution to the problems of cotton growing. Too much depends on weather and other factors beyond the individual farmer's control.

The way cotton is grown on an individual farm may be evaluated by use of the scoring system presented here, by making adaptations to individual farm conditions. A score card for this purpose has been prepared (see below).

The fertilization score should not be marked down on farms where soil tests show that fertilizer is not needed. Nor will insect control be needed to the same extent on every farm in every year. Land preparation and cultivation operations need to be evaluated from the standpoint of prior crops and type of soil. Man labor requirements for individual farms may be computed from the farmer's own estimates by operations performed, or from the averages (per acre covered) presented in Appendix Tables 6 and 7 for the various operations by size of horse-drawn or tractor equipment. Computed labor requirements may then be compared with lowest probable labor requirements (see page 24 and Table 8).

SCORE CARD
for
Cotton Production Practices in Southeastern Oklahoma

Item	Possible Score*	Your farm
Seed and Seeding Rate (20 points)		
Variety	10	
Rate of seeding	5	
Method of planting and spacing	5	
Fertilization (10 points)	10	
Insect Control (20 points)	20	
Land Preparation and Cultivation (20 points)		
Kind of operations	10	
Timeliness of operations	10	
Method and Time of Harvesting (10 points)	10	
Labor Requirements (20 points)		
Compared with lowest probable for each power group (horse or tractor) according to importance	10	
Compared with lowest probable using tractor power	10	
Total Score	100	

* The possible score is based on Experiment Station recommendations and evaluation of information obtained from farmers. The method of rating cotton practices is discussed in detail on pages 13 to 25.

There are other factors in successful cotton production which are even more difficult to measure than the ones considered. For example, rotation of cotton with other crops will aid in controlling insect and plant diseases and reducing soil erosion. In addition, a legume crop in the rotation will help to maintain organic matter and nitrogen and improve physical condition of the soil.

Production Resources on Sample Farms

Methods and equipment used in growing cotton frequently vary somewhat according to the number of acres grown on any one farm. Both production practices and incomes are considerably influenced by size of farm. Therefore, in this study the farms surveyed were divided into three groups—small, medium, and large—according to the acreage of cotton grown.

Based on 1944 Census figures for all farms with cotton, approximately 44 percent of the farms in the area had less than 10 acres of cotton per farm, but they accounted for only 19 percent of the cotton acreage (Table 3). Farmers in the large size group (30 acres or more per farm) accounted for only 10 percent of the farms but harvested about 30 percent of the cotton.

In order to set the stage for a detailed evaluation of the cotton enterprise, some of the important characteristics of farms visited in the field survey are examined. The size of farm, other crops, livestock, and labor on the three groups of farms studied is indicated in Table 4. In 1947, small cotton farms had an average of only 6 acres in cotton, 36 acres of cropland, and 89 acres in the entire farm. Medium farms had almost twice as many acres of total land as small farms, but considerably more than twice as much cropland. Also, there were almost three times as many acres of cotton on medium farms as on small farms. Large cotton farms had 261 acres of total land and 159 acres of cropland, or almost twice as much cropland as medium farms. The average proportion of cropland in cotton was relatively low for all size groups: 17 percent on small farms, 18 percent on medium farms, and 37 percent on large farms. Peanuts was a cash crop on 40 percent of the small farms, 29 percent of the medium farms, and 8 percent of the large farms. Corn was grown on about one-third of the cropland on farms in each size group. Hay and other feed crops accounted for most of the remaining crop acreages. A few farmers in the medium-sized group reported large acreages of cropland idle in 1947.

In 1947 tractors were used on 12 percent of the small, 45 percent of the medium, and 96 percent of the large farms based on this study. A comparison with 1944* indicates the greater extent of mechanization in 1947 on all farm size groups. Workstock were still maintained on all of the small farms with tractors, but on only one-third of the medium and large farms using tractor power were workstock reported. Replace-

* Table 5.

Table 3.—Cotton Harvested—Farms Reporting, Acreage, and Production, Southeastern Oklahoma. 1944.*

Size group (Acres in Cotton)	Farms Reporting		Acres of Cotton		Bales Produced		Percent of Farms Having Tractors
	Total Number	Percent of Total	Total Number	Percent of Total	Total Number	Percent of Total	
Small (Under 10)	2,114	44.4	13,169	18.6	4,663	18.2	5.3
Medium (10-29)	2,178	45.8	36,582	51.7	13,598	53.1	25.6
Large (30 and over)	464	9.8	20,960	29.7	7,347	28.7	64.0
Total	4,756	100.0	70,711	100.0	25,608	100.0	20.3

* Data from Table 1, Special Report—"Cotton Farms Classified by Acreage Harvested," *U. S. Census*, 1945.

Table 4.—Land Use, Cropland, Livestock, and Resident Labor Organization, Average per Farm, by Size of Farm, Southeastern Oklahoma, 1947.

Item	Small farms*	Medium farms*	Large farms*
	Acres	Acres	Acres
Land Use:			
All land in farm	88.8	167.7	260.7
Owned	61.2	101.1	88.1
Rented in	27.6	66.6	172.6
Total cropland	35.6	84.8	159.4
Permanent pasture	48.5	58.5	95.6
Cropland Organization:			
Cotton	5.9	15.6	59.6
Corn	12.5	28.5	57.0
Sorghums	1.8	3.2	1.8
Oats	4.6	10.7	29.5
Peanuts	6.8	15.7	2.5
All hay	1.1	1.8	4.3
All other crops	1.6	.8	4.4
Idle	1.3	8.5	2.3
Acreage double-cropped	——	——	2.0
Livestock Organization:	Number	Number	Number
Workstock	2.5	2.0	1.1
Milk cows	3.5	3.5	4.2
Other cows	2.2	3.7	6.0
All other cattle	3.2	7.8	12.0
Brood sows	.8	.9	1.2
Hens and pullets	37.1	58.1	74.6
Tractor	.1 (3)**	.5 (14)	1.3(24)

	No. Families	No. Workers	No. Families	No. Workers	No. Families	No. Workers
Labor Organization:						
Operator	1.00	2.80	1.00	2.94	1.12	2.48
Cropper	.04	.12	None		.32	1.20
Other tenant	None		None		None	
Wage hand	None		.06	.16	.20	.36

* 25 small farms, 81 medium farms, 25 large farms. Small, 1 to 9 acres of cotton; medium, 10-29 acres of cotton; large, 30 acres of cotton and over.

** Figures in parentheses refer to number of farmers reporting tractors. In large farm group, 24 farmers reported 33 tractors.

ment of present workstock after they die is unlikely and unnecessary on tractor farms.

Only one farmer in the small size group and three in the large group reported sharecropper families on their farms. These sharecroppers shared on a 50-50 basis in the cotton and corn crops; and on one large farm, in the oat enterprise. Only one farmer in the medium and three in the large group reported the use of regular wage hands in 1947.

The typical ownership pattern of cotton farms in southeastern Oklahoma includes a large proportion of owner-operators. A larger proportion of the farm land was owned on both the small and medium-sized cotton farms than on the large farms (Table 4). More than one-half of the small and medium-sized units were held in full or part ownership, and owner-operated farms were larger than rented units. Conversely, rented units were larger than owner-operated units in the large farm group. The predominant tenure arrangement was share—¼ of the cotton and peanuts and ⅛ of the feed crops.

The Effect of Peanuts on Farm Organization

In 1947, small and medium-sized cotton farms which grew both cotton and peanuts had much larger acreages of total land and cropland as well as more cotton than did farms without peanuts (Table 5). In fact, medium farms with peanuts had more total land but slightly less cropland than large cotton farms without peanuts. In each group, the number of farms growing cotton only was greater than those growing both cotton and peanuts.

The small amount of cropland on small farms without peanuts has hindered the addition of peanuts in the farm organization, because of the necessity of producing feed crops for workstock and other livestock on the cropland not in cotton. Since any reduction in cotton acreage to produce peanuts would result in "sub-small" and inefficient acreages of both crops, many operators of small farms in this area had to choose between the two crops, within limits of soil adaptations.

On the other hand, there is some indication that many of the small farms producing both peanuts and cotton in 1947 had enough cotton in previous years to classify as medium cotton farms. However, these operators apparently reduced cotton and increased peanut acreages because of the greater demand for peanuts. Other farmers who were able to enlarge their farms by acquiring more land had a choice of producing either cotton or peanuts on the additional land. At least in recent years, these farmers tended to produce peanuts rather than cotton on most of the additional acreage.

On the larger farms, peanuts have been adapted to more complete mechanization than cotton.* In fact, many operators of large farms used

* See "Usual Labor Requirements for Peanuts," page 21.

Table 5.—Land Use, Cropland Average Per Farm by Size of Farm, On Cotton Farms With Peanuts and Without Peanuts Southeastern Area, 1947.

Item	Small Farms		Medium Farms		Large Farms	
	Without Peanuts	With Peanuts	Without Peanuts	With Peanuts	Without Peanuts	With Peanuts
	Acres		Acres		Acres	
Land Use:						
All land in farms	68.6	119.0	112.6	302.2	270.3	150.0
Owned	51.3	76.0	63.6	192.8	87.9	90.0
Rented in	17.3	43.0	49.0	109.4	182.4	60.0
Total crop land	21.5	56.7	60.3	144.9	161.5	135.0
Permanent Pasture	43.7	55.8	37.2	110.5	103.0	10.0
Cropland Organization						
Cotton	5.8	6.1	15.3	16.3	61.1	41.5
Peanuts	0	17.1	—	53.9	—	31.5
Corn	11.0	14.7	23.8	40.3	57.8	48.5
Grain Sorghums	.5	2.4	.3	6.1	.9	—
Other Sorghums	.3	1.0	.7	2.4	1.0	—
Oats	2.0	8.5	12.0	7.8	32.1	—
All hay except peanuts	.8	1.5	1.4	2.8	4.6	—
All other crops	1.1	2.2	.7	1.0	3.8	11.0
Idle	—	3.2	6.1	14.3	2.3	2.5
Acreage double-cropped	None		None		2.1	None
	Number		Number		Number	
Livestock:						
Organization:						
Workstock	2.4	2.7	2.0	2.2	1.1	—
Milk cows	2.1	5.5	3.3	4.0	4.4	1.0
Other cows	2.3	2.1	1.3	9.7	6.3	2.0
All other cattle	2.6	4.1	6.2	11.9	12.8	3.0
Brood sows	.7	.8	1.1	.4	1.2	.5
Hens and pullets	29.5	48.4	46.4	86.9	78.3	32.5
Tractor	—(0)*	.3(3)*	.4(8)*	1.0(6)*	1.2(22)*	1.5(2)*
Number of farms	15	10	22	9	23	2

* Farms Reporting Tractor.

this opportunity to increase peanut acreages and do away with cotton entirely in their farming systems, as indicated by only two large cotton farms out of a total of 25 with peanuts reported in 1947. On one of these farms only 3 acres of peanuts were grown.

With the return of adjustment programs for both cotton and peanuts, there is strong likelihood that more farmers in southeastern Oklahoma are producing both crops in 1950 than in 1947. Most farmers producing cotton and no peanuts in 1947 were doing so because of size and soil limitations. Choice was also a factor, as well as a more favorable cotton yield level on some of the highly fertile bottomland soils in areas of adequate labor supplies.

In general, farms with peanuts had more livestock to utilize larger acreages of corn and other feed crops as well as the peanut hay. More tractors were also reported on cotton-peanut farms.

Cotton Growing Practices

The following pages present details of the procedure followed in evaluating the various factors used in developing the scoring system. This will aid in using the score card, and will also serve to give a general picture of cotton production practices now in use and recommended. In preparing the scoring system, and rating present practices, economists were aided by production specialists of the Oklahoma A. & M. College experiment station and extension service who are familiar with both research results and cotton practices now in use on farms.*

SEED AND SEEDING RATE:

Variety, Rate of Seeding, and Method of Planting and Spacing

Recommendations

A good cotton variety must be a high yielder, have a good lint turnout, a length of staple in market demand, and a fiber with high tensile strength and good character. A cotton variety with relatively large boll size is important in hand picking. Early maturity is also desirable. Some of the more common varieties which appear to meet most of the above tests are Deltapine, Rowden, and Stoneville. To insure varietal purity, the farmer needs a reliable source of planting seed. Therefore, the use of purchased planting seed is considered more desirable because home-grown seed involves greater possibility of contamination and mixing. However, farmers with gin and other facilities available to preserve purity of seed should not hesitate to save home-grown seed of high quality. For some farmers, the purchase of sufficient registered seed each year to plant the next year's crop would be a profitable practice.

About 16 pounds of high germinating non-delinted seed and 8 to 12 pounds of delinted seed per acre are desirable seeding rates for southeastern Oklahoma. Spacings of from 8 to 16 inches with 1 to 3 plants in the hill appear to be satisfactory although results are inconclusive.

Present Practices

The total cottonseed used per acre of cotton planted in 1947, for both planting and replanting, amounted to 21 pounds on small and medium farms, and 24 pounds on large farms. There was a wide variation in the amount of cottonseed planted per acre. The average seeding rate for non-delinted seed was about 20 pounds per acre. For delinted seed, the average seeding rate varied from 11 pounds on medium-sized farms to 19 pounds on large farms. A major-

* Dr. John M. Green, Agronomist, in charge of cotton research, Oklahoma Agricultural Experiment Station, (Co-op. U.S.D.A.), I. M. Parrott, superintendent of the Oklahoma Cotton Research Station at Chickasha, and Wesley C. Chaffin, Oklahoma Extension Agronomist, reviewed the entire manuscript and furnished suggestions for the agronomic sections. Dr. Horace J. Harper, Soils Scientist, Oklahoma Agricultural Experiment Station, furnished suggestions for the sections on fertilization and land preparation and cultivation. Dr. F. A. Fenton, Entomologist with the Experiment Station, furnished suggestions for presentation of the section on insect control. W. J. Oates, Agricultural Engineer in charge of the Experiment Station's cotton mechanization research, reviewed the manuscript and furnished suggestions for the sections on land preparation and cultivation and labor and power requirements.

ity of the cotton acreage was planted with purchased seed, with the percentage of purchased seed greater on the medium and large farms than on small cotton farms. More than 80 percent of the purchased seed had been treated when bought; and on large cotton farms, 59 percent of the purchased seed also had been delinted. None of the home-grown seed planted on small and medium-sized farms was treated or delinted, but 31 percent of the home-grown seed on large farms was treated.

The most popular cotton varieties in 1947 were Rowden and Deltapine. Other important varieties were Mebane and Stoneville. Most of the planting seed was of recent origin, although over one-fourth of the home-grown seed on medium and large farms was over three years from breeder.

All cotton reported by farmers visited in southeastern Oklahoma was planted solid in drill, and most of it was hand chopped to a stand. Farmers in the medium group reported that 8 percent of their cotton was not chopped (spaced) after planting. Although width of row varied from 34 inches to 42 inches, 36-inch rows were most common on small and medium farms and 38-inch rows on large farms.

Details of "Planting Seed" are summarized in Appendix Table 1.

Rating of Present Practices (20 points)

Variety was evaluated on the basis of kind, source of seed, and years from breeder. A top score of 5 was given for a variety, such as Deltapine, Rowden, and Stoneville 62, which had shown up well in experiment station tests. Other varieties were rated 4, 3, etc. Purchased seed was given a rating of 2 points and home-grown seed 1 point. Seed which was direct from breeder was given a rating of 3 points. Seed two years from breeder was rated 2 points, and seed three years from breeder, 1 point. Any seed more than three years from breeder was given 0 points. On the basis of these ratings, large farms appeared to have the best seed, followed by medium and small farms.

Rate of seeding (5 points) and method of planting and spacing (5 points) appear to be adequate for all size groups. In fact, many southeastern Oklahoma farmers may be planting more seed per acre than is necessary provided seed is of good quality and high germinating.

Indicating the good quality of planting seed, large farms received 19; medium farms, 18; and small farms, 17 out of 20 possible points for this general group.

FERTILIZATION

Recommendations

On dark-colored soils low in available phosphorus, apply 150-250 pounds of 4-16-0 or 4-12-4; or 100 pounds of 10-20-0 per acre. For light-colored soils low in nitrogen and phosphorus, an application of 150-200 pounds of a 5-10-5 or 8-8-8 fertilizer is desirable. When cotton is grown on potash-deficient soils, apply 200 pounds of a 5-10-10 or 8-8-8 per acre. If the soil is dark-colored, a 3-9-18 fertilizer may be used.

Cotton planted on eroded or shallow soils will not respond well to

fertilizer treatment. Lack of proper moisture will also prevent full response to fertilizer.

Present Practices

About one-fourth of the cotton acreage on small and medium farms was fertilized by slightly more than one-fourth of the farmers. However, only one farmer in the large group used any fertilizer on cotton, the acreage fertilized amounting to only 3 percent of all cotton planted by farmers on large farms. One farmer reported the use of superphosphate only while all other farmers who fertilized cotton used a complete fertilizer. The average rate of fertilizer application per acre was 147 pounds on small farms, 126 pounds on medium farms, and 200 pounds on the one large farm. The most popular analysis was 4-12-4, although a small acreage received 5-10-5, and one farmer reported the use of 6-10-4. The average amount of fertilizer elements (N-P-K) is small, especially on the basis of the total number of acres of cotton planted by all farmers in each size group.

Details of "Fertilizer Practices" are summarized in Appendix Table 2.

Rating of Present Practices (10 points)

A rating of 5 points was given for the use of proper analysis and 5 points for average quantity (175 lbs.) considered desirable. The proportion of cotton acreage not needing commercial fertilizer, 34 percent on large farms, was also taken into consideration. On this basis, small farms received 3 points and medium and large farms, 4 points each.

INSECT CONTROL

Recommendations

"Based on experimental evidence, we recommend two early applications of 3-5-40 (3 percent gamma BHC, 5 percent DDT, 40 percent sulfur) or 20 percent chlorinated camphene (toxaphene) plus 40 percent sulfur at the rate of approximately 10 pounds per acre per application. The first application should be made one week after the appearance of the first blooms on the plants and the second application a week later."*

In years of frequent rain during the growing season, "it is necessary to protect cotton by three more dust applications using the same materials at the rate of 10 to 12 pounds per acre per application. These later applications should be started about July 21 and should be spaced at 5-7 day intervals."* These later applications should be begun when 10 percent infestation occurs and continued as necessary.

Since southeastern Oklahoma conditions are most favorable for the boll weevil, poisoning for control should be done every year unless soil fertility would limit cotton yield to less than one-third bale per acre.

Present Practices

Insecticides had been used on only 4 percent (1 farm) of the small cotton farms and on 25 percent of

* Oklahoma A. & M. College Extension Service Cir. No. 499, *Control Recommendations for Cotton Insects.*

the medium-sized farms during the past 10 years. On the other hand, insecticides had been used at least on year in the past 10 years on 64 percent of the large cotton farms. Based on the relative importance of cotton acreage on the three size groups of farms, about 21 percent of all cotton grown in 1947 was poisoned. Only 5 percent of the cotton acreage on small cotton farms and 10 percent on medium farms was poisoned in 1947 compared with 49 percent on large farms. Calcium arsenate was the most important material used, but about 60 percent of the acreage was poisoned with more than one type of material. Some farmers mixed sulfur or paris green with calcium arsenate. Others used sulfur, paris green, or DDT alone, most of the time after prior dusting with calcium arsenate. None of the acreage poisoned received less than two applications and some cotton was poisoned five times. Some poisoning was begun by June 1 and continued as late as August 15.

Details of "Poison Practices" are summarized in Appendix Tables 3 and 4.

These data indicate the increasing interest of southeastern Oklahoma farmers, particularly operators of large farms, in a successful cotton insect control program. New insecticides, now increasingly available, should furnish more adequate means of control.

Rating of Present Practices (20 points)

Rating of present practices was based on 10 points for correct kind and quantity of poisoning material, and 10 points for correct time and number of applications. On the basis of these evaluations, small farms received 1 point; medium farms, 2 points; and large farms, 9 points.

LAND PREPARATION AND CULTIVATION

Recommendations

In general, operations recommended are those which will result in thorough preparation of the seedbed; thoroughness of cultivation to destroy weeds and grass, loosen the soil, and conserve moisture; and chopping to the desired stand. All of these operations must be performed on time for maximum production.

Present Practices

Most cotton farmers were doing a fair job of land preparation and cultivation, both as to kind and timeliness of operations, but the best jobs were found on the large farms because of a greater proportion of tractor-drawn equipment. Details of kind of operations performed may be determined from Appendix Tables 6 and 7, and "time of operations" is discussed under "Labor and Power Requirements," page 20.

Rating of Present Practices (20 points)

Kind of operation and timeliness of operation were each given a rating of 10 points. Small farms received a rating of 17 points for the two comparisons; medium farms, 18 points; and large farms, 19 points.

METHOD AND TIME OF HARVESTING

Recommendations

Cotton should be harvested as soon as possible after the bolls open to reduce weather damage. In general, hand picking results in better quality than other methods of harvesting, and in southeastern Oklahoma, most cotton is picked. However, snapped cotton can be well cleaned if adapted gin machinery is available. Apparently, few gin operators in southeastern Oklahoma have this equipment for handling snapped or machine harvested cotton.

Present Practices

Most of the cotton grown in 1947 was harvested by hand picking. However, 8 percent of the cotton on small farms, and 12 percent on medium farms, and 14 percent on large farms was harvested by snapping. Hand snapping was more prevalent during the later part of the harvesting period and was used partly as a salvage operation. In fact, only 3 farmers out of 27 who reported snapping used this method for harvesting all of their crop. As would be expected, hired labor was of most importance on large farms and of least importance on small farms. A larger proportion of labor for snapping was hired than for picking. About 1430 pounds of picked cotton and 2000 pounds of snapped cotton were required to make a 500-pound gross bale. About 850 pounds of this was cottonseed. The importance of Deltapine cotton influenced the relatively high lint turnout. In addition to variety, variation in the quality of the harvesting operation also affected the lint turnout. Yields on large farms were higher because they were located primarily on bottomland and the better grades of upland soils. These yields result in higher labor requirements for harvest in Appendix Table 7 than indicated in Table 6, page 18.

Details of "Cotton Harvesting Practices" are summarized in Appendix Table 5.

Rating of Present Practices (10 points)

Method and time of harvesting were given a rating of 10 points. A rating of 5 points was given for cotton picked with any reduction based on proportion of cotton harvested by other methods. Snapping is a satisfactory method of harvesting, provided adequate gin equipment is available. A rating of 5 points was given for all cotton harvested by December 1. For each 5 percent or fraction of cotton remaining for harvest after these dates, 1 point was subtracted. On this basis, small farms received a rating of 9 points; medium farms, 8 points; and large farms, 7 points.

LABOR AND POWER REQUIREMENTS

The most efficient and profitable cotton production practices are the ultimate goals of all cotton research. In any kind of planning on cotton farms, consideration should be given to both the labor needed to grow cotton and major competing crops and the labor available for crop production. This evaluation will influence the amount of cotton which

Table 6.—Usual Operations, Labor and Power Requirements, for an Acre of Cotton, Southeastern Oklahoma, 1947.

Item	Size of Equipment	Acres per 10 hour day	Times Over	Hours per acre			
				Man	Horse	Tractor	T
Animal Drawn Equipment							
Cutting stalks or disc harrowing	1 row 4 foot	8.0	1.0	1.2	2.4	—	
Flat breaking	2-H (12")	2.2	1.0	4.6	9.2	—	
Bedding	2-H lister	6.0	1.0	1.7	3.4	—	
Harrowing	2-sect.	12.5	1.0	.8	1.6	—	
Planting	1-row (1-H)	6.7	1.0	1.5	1.5	—	
Cultivating	1-row	6.0	5.0	8.4	16.8	—	
Chopping and Hoeing	Hand	1.2	2.0	16.0	—	—	
Total preharvest				34.2	34.9		
Picking	Hand	175*	2—3	30.0	—	—	
Hauling to Gin	1 bale wagon	4.5	—	2.2	4.4	—	
Total (Usual)				66.4	39.3	—	
Total (if all picked)				(66.4)	39.3	—	
Total (if all snapped)				(60.9)			
Tractor Drawn Equipment							
Cutting stalks	2-row	25.0	1.0	.4	—	.4	
Flat breaking	2-14"	8.0	1.0	1.3	—	1.3	
Disc harrowing	7 ft.	20.0	1.0	.5	—	.5	
Bedding	2-row lister	20.0	1.0	.5	—	.5	
Harrowing	2-sect.	30.0	1.0	.3	—	.3	
Planting	2-row	20.0	1.0	.5	—	.5	
Cultivating	2-row	20.0	5.0	2.5	—	2.5	
Chopping and hoeing	Hand	1.2	2.0	16.0	—	—	
Total preharvest				22.0	—	6.0	
Picking	Hand	175*	2—3	30.0	—	—	
Hauling	1 bale truck	5.6	—	1.8	—	—	1
Total (Usual)				53.8	—	6.0	1
Total (if all picked)				(53.8)			
Total (if all snapped)				(48.3)			

* Pounds per 10-hr day. Usual per acre yield of cotton is 175 pounds lint which is equivalen 525 pounds seed cotton picked or 735 pounds seed cotton snapped.

can be safely grown and the other crop and livestock enterprises which can be introduced into the farming system. A first step in this process is the determination of labor and power requirements for cotton. Therefore, the purpose of this section is to summarize man labor and power requirements for cotton and to provide a standard for evaluating efficiency of labor and power use.

Present Practices

Usual Labor Requirements.—The usual amount of labor required to produce an acre of cotton, as reported by the farmers visited, varied from 53.8 man hours per acre on farms with 2-row tractor equipment to 66.4 man hours per acre on farms with horse power (Table 6). About 39 hours of horse power or 8 hours of mechanized power (tractor plus truck) were required to produce an acre of cotton. Tractor power was used on 11 percent of the cotton acreage in the small farm group, 52 percent in the medium-sized group, and 98 percent in the large farm group. This indicates that tractor power reduces total man labor requirements per acre about 19 percent, but reduces preparation, planting, and cultivating labor 67 percent.

Labor for chopping and hoeing required 16 man hours per acre. This one operation accounted for 47 percent of total preharvest requirements on farms with horsepower and 73 percent on farms with tractor power.

Picking, the usual method of harvesting cotton in southeastern Oklahoma, required a total of 30 hours per acre with a lint yield of 175 pounds, or 45 percent of total labor requirements per acre on farms with horse power and 56 percent on farms with tractor power. Harvesting plus chopping and hoeing labor accounted for 69 percent of the usual labor requirements per acre on farms with horse power, and 86 percent of total labor requirements on farms with tractor power. Successful mechanization of the chopping and harvesting operations would materially reduce per acre labor requirements of cotton. In computing harvest labor requirements, the usual rates used were 17.5 pounds of picked seed cotton (5.83 lbs. lint) per hour and 30 pounds of snapped seed cotton (7.15 lbs. lint) per hour. Farmers who substituted snapping for picking reduced harvesting labor about one-fifth. On a cost basis, farmers saved very little by substituting snapping for picking.* In addition, there are other disadvantages to snapping such as poorer lint quality and low prices of snapped cotton relative to picked cotton. Apparently most of the cotton snapped in 1947 was harvested by this method because of a lack of labor to get the last of the cotton picked late in the season. Snapping is unlikely to become more prevalent in southeastern Oklahoma unless the cost of snapping per hundredweight relative to the cost of picking per hundredweight becomes more favorable than

* The substitution of snapping for picking reduced costs of harvesting only $3.05 per bale and $1.12 per acre, based on 1947 rates reported by farmers for harvesting ($3.00 per hundredweight for picking and $2.00 per hundredweight for snapping). Since snapping increased cost of ginning about $2.82 per bale, farmers would have gained little, if any advantage from substitution of snapping for picking. Other common wage rates were: for chopping and hoeing, 35 cents per hour; and for tractor driving, 50 cents per hour.

in 1947, or labor less plentiful. Also, modern cleaning machinery must be available in many additional gins for satisfactory quality of lint from snapped cotton.

Variation from Usual Operations and Equipment.—In 1947, farmers used a wide range of machinery and equipment in producing the cotton crop (details of these variations and the proportion of the cotton acreage affected are available in Appendix Tables 6 and 7). The variations included both differences in type of operation and size of equipment; and farmers with workstock varied the number of head attached to the same size implement in order to do a more thorough or faster job. Most horsedrawn operations were performed with two head of workstock but three and four head were sometimes used. All planters and cultivators reported on tractor farms were 2-row, and most of the other equipment reported was 2-row or its equivalent.

The rated drawbar horsepower (Nebraska tests) of the 51 tractors reported on farms visited were: less than 12.0, 9 percent; 12.0-18.4, 58 percent; 18.5-24.9, 25 percent; and 25.0 and over, 8 percent. All tractors were of the general purpose row-crop type except one, an old standard tractor used in oat threshing. In 1947, 47 percent of the tractors reported were less than 4 years old, 45 percent from 4 to 8 years old, and only 8 percent more than 8 years old.

Variation from usual hours required to produce an acre of cotton.—Assuming all cotton picked, it appears that some farmers with horse power were able to save 4.0 man hours per acre, 6 percent of total, by the use of larger equipment in land preparation, planting, and cultivating. On the other hand, some tractor farmers were apparently able to save only .6 man hours per acre, 1 percent of total, by the use of larger than usual equipment. These small savings, compared with the usual hours reported in Table 6, can be accounted for by the large proportion of total labor on cotton required by chopping and hoeing and harvesting and, also, by the lack of significant size variations in most equipment reported in Appendix Tables 6 and 7. For example, there was no 1-row or 4-row planting or cultivating equipment reported on the 41 farms with tractor power visited.

Time of Operation.—Timeliness of operation is important in the successful production of cotton. Barring adverse weather conditions, the average cotton grower in southeastern Oklahoma has sufficient leeway in the possible time of operations to produce a cotton crop successfully (Figures 2 & 3). Difficulties in cotton production arise principally from adverse weather conditions in combination with labor requirements for harvesting, chopping, and hoeing which are usually greater than the farm family can furnish. Peak labor requirements are concentrated in June, when cotton must be cultivated, chopped, and hoed, and in September and October, the major months of cotton harvest. Land preparation usually begins in January and ends with preparation of the seedbed in April or the first half of

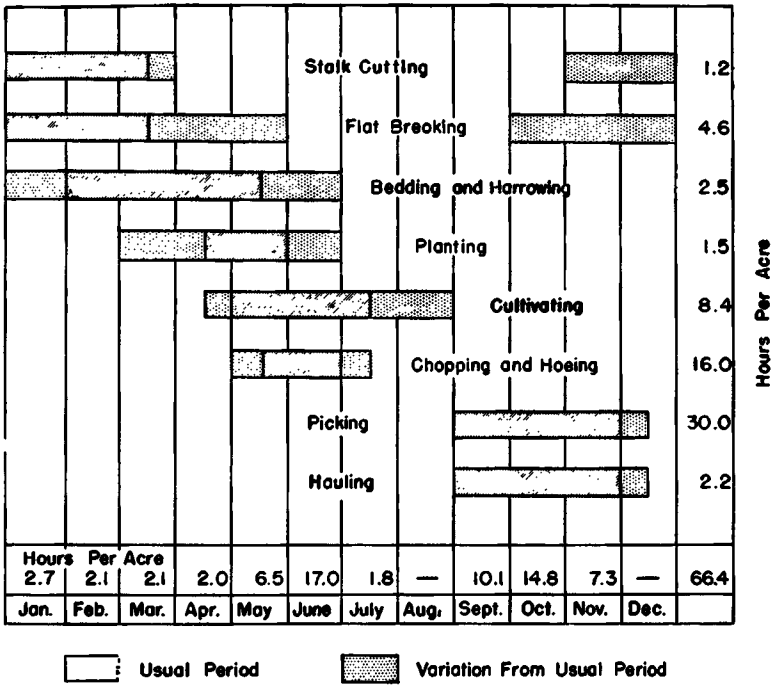

Fig. 2.—Periods in which cotton production operations are usually performed on farms with horse power, southeastern Oklahoma.

May. April and May are usually the planting months in the area. Chopping and hoeing was most common the last half of May, June, and the first half of July. Harvesting began in early September and lasted usually through November. Some flat breaking was reported by tractor farmers as a group during 10 months of the year. Disc harrowing and flat-breaking after oats were begun in August by some farmers. In general, farmers with tractors had a wider time range of production operations than did farmers with horse power. However, there were a number of farmers with horse power who practiced fall plowing of cotton land.

Usual Labor Requirements for Peanuts.—Since peanuts have occupied a considerable proportion of cropland for many years, the importance of peanuts as a cash crop in southeastern Oklahoma is well known. The importance of peanuts as a cash crop on cotton farms has been discussed under the section, "Production Resources on Sample Farms," and indicated in Tables 4 and 5 on pages 10 and 12. With adjustment programs now in effect for both cotton and peanuts, more farmers likely are producing both cotton and peanuts than was the case in 1947 when no production controls were in effect for either crop. For

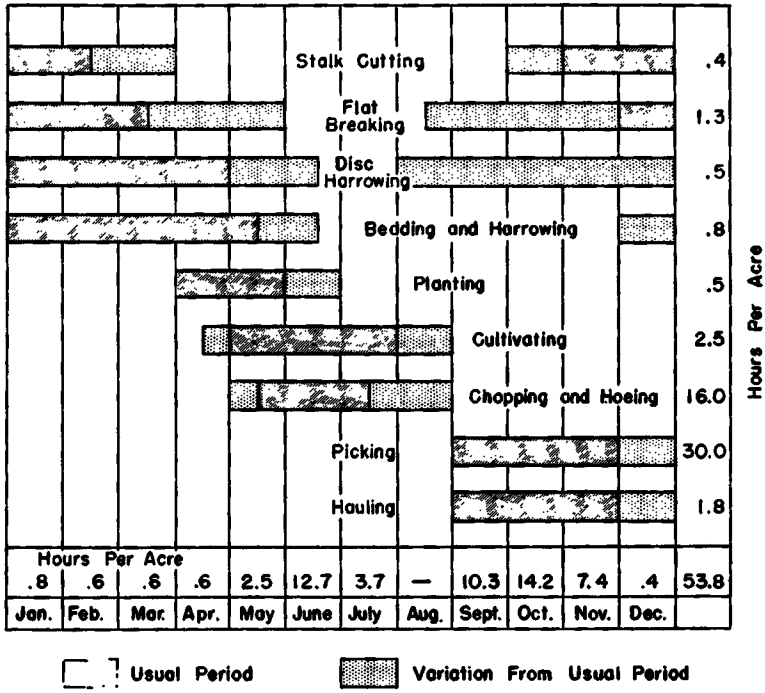

Fig. 3.—Periods in which cotton production operations are usually performed on farms with tractor power, southeastern Oklahoma.

individual farmers to evaluate more properly production opportunities on their farms, labor requirements for peanuts have been considered (Table 7). Apparently, peanuts are being produced with about 13.5 hours less man labor per acre with horse power and 32.2 hours less man labor per acre with tractor power than cotton with a yield of 175 pounds lint.* The principal difference with horse power is less hoeing and cultivating labor used in producing peanuts since harvest labor requirements are about the same for both crops. With tractor power, both preharvest (including hoeing and cultivating) and harvest labor requirements are less for peanuts than for cotton. Although the method of raking peanuts in the windrow with a side delivery rake has been used for only a few years, it is now the most common method for harvesting peanuts on farms with tractor power. The only additional labor needed before hauling to the thresher is for turning the vines and cleaning up the ends of fields. Other harvesting methods are also used to some extent

* Labor requirements for cotton would vary more with differences in yield than for peanuts. For yields of cotton of less than 175 lbs. per acre, the labor advantage of peanuts would be less; and for yields of cotton of more than 175 lbs. per acre, the labor advantage of peanuts would be more.

Table 7.—Usual Operations, Labor and Power Requirements, for an Acre of Peanuts, Southeastern Oklahoma, 1947.

Item	Size of Equipment	Times Over	Hours per acre		
			Man	Horse	Tractor
	Animal Drawn Equipment				
Breaking	2-H (12")	1.0	1.2	2.4	
Bedding	2-H lister	1.0	1.7	3.4	
Harrowing	2-section	1.0	.8	1.6	
Planting	1-H	1.0	1.5	1.5	
Cultivating	1-row	4.0	6.7	13.4	
Hoeing	Hand	1.5	9.0		
Total Preharvest			20.9	22.3	
Digging	1-row	1.0	2.0	4.0	
Shaking and Stacking	Hand	1.0	23.0		
Threshing and baling*	—	1.0	7.0	6.5	
Hauling to market	Truck	1.0	**		
Total (usual)			52.9	32.8	
Total (if windrowed by hand)			(39.9)		
	Tractor Drawn Equipment				
Breaking	2-14"	1.0	1.3		1.3
Disc Harrowing	7 ft.	1.0	.5		.5
Harrowing	2-sect.	1.0	.3		.3
Planting	2-row	1.0	.5		.5
Cultivating	2-row	4.0	2.0		2.0
Hoeing	Hand	1.5	9.0		
Total Preharvest			13.6		4.6
Digging	2-row	1.0	0.5		0.5
Raked and windrowed	side del.	1.0	1.5		0.5
Threshing and baling*	—	1.0	6.0	4.5	1.0
Hauling to market	Truck	1.0	**		
Total (usual)			21.6	4.5	6.6
Total (if windrowed by hand)			(30.1)		
Total (if shaken and stacked by hand)			(43.1)		

* Not including labor normally furnished by thresher operator, about 2.0 hours per acre. Assumes a peanut yield of 20 bushels per acre.
** Usually hired.

and the effect on total labor requirements are indicated in Table 7. Some farmers with horse power were able to save about 13 hours per acre (25 percent) by shaking the vines and throwing them in the windrow instead of stacking around poles. However, on tractor farms this method required 8.5 hours (39 percent) more labor than was required with the raking method. Only a few tractor farmers shake and stack peanuts on poles any more, and the use of this method would require 21.5 man hours per acre more, or about twice as much labor as was required with the raking method.

Considering total labor requirements with horse power for both crops, about 12.6 acres of peanuts can be produced with the same labor required for 10 acres of cotton. Considering preharvest labor only, about 16.4 acres of peanuts can be "laid by" for each 10 acres of cotton.

Considering total labor requirements with tractor power (and using a side delivery rake in harvesting peanuts), about 24.9 acres of peanuts can be produced with the same labor required for 10 acres of cotton. Up to harvest, about 16.2 acres of peanuts can be handled for each 10 acres of cotton.

Production operations on peanuts are performed at approximately the same time as on cotton. Peanuts are dug as the nuts mature, usually from the middle of September to the end of October. After curing, the peanuts are threshed, sacked, and marketed. However, the peanut harvesting operations usually last over a shorter period of time than for cotton. A full crew can get the threshing job over in a few days.

This direct competition between the two crops, and the labor advantage of peanuts, explains partly the reasons for the considerably greater acreages of peanuts than cotton on farms growing both crops (see Table 5 on page 12.)

Rating of Present Practices

(20 points)

How Standards Were Determined. —The reports of farmers with low labor requirements per acre were used as a guide in determining a desirable standard. Two kinds of camparisons were used and are reported in Table 8. They were:

1. Average man labor requirements per acre of cotton for each size group in 1947 were compared with lowest probable labor requirements per acre calculated on two different bases: (a) If all farms with horse power used labor-saving operations; (b) if farms with tractor power used most labor-saving operations. Both the present average and the lowest probable labor requirements were obtained by weighting on the basis of the proportion of cotton produced with horse power and tractor power within each size group. (For example, the average and lowest probable labor requirements for small farms with horses were given a weight of 89 percent and the average lowest probable labor requirements for small farms with tractor power were given a weight of 11 percent to obtain the weighted average for small farms in Table 8.) For each 2 percent or fraction thereof that average requirements were above lowest requirements, 1 point was subtracted. These ratings are the first presented under labor requirements, to the right of "Compared with lowest probable for each power group" in Table 2 on page 7.

2. Average man labor requirements per acre of cotton were compared with what the lowest probable labor requirements per acre would be if all farms within each size group used most labor-saving operations with tractor power. For each 5 percent or fraction thereof that average man labor requirements were above lowest probable with tractor power, 1 point was subtracted (Table 8). These ratings are the second presented under labor requirements, to the right of "Compared with lowest probable using tractor power" in Table 2 on page 7.

These comparisons resulted in a rating of 12 points for the small

Table 8.—Method for Rating Labor Requirements for an Acre of Cotton, Southeastern Oklahoma, 1947.

Size-Equipment group	Percent of Cotton Acres	Av. lbs. lint per acre	Av. Man hours per acre	Lowest probable hours per acre*	Percent av. labor requirements are of lowest probable	Rating
Comparison weighted by proportion of horse and tractor power						
Small farms:						
With horses	89	160	59.29	56.52		
With tractors	11	141	37.79	37.79		
Weighted average	xx	158	56.92	54.46	105	7
Medium farms:						
With horses	48	181	65.17	63.09		
With tractors	52	189	49.15	48.64		
Weighted average	xx	185	56.84	55.58	102	9
Large farms:						
With horses	2	164	61.45	60.03		
With tractors	98	241	65.21	63.67		
Weighted average	xx	239	65.13	63.60	102	9
Comparison with lowest probable hours per acre with tractor power						
Small farms	xx	158	56.92	46.71	122	5
Medium farms	xx	185	56.84	51.35	111	7
Large farms	xx	239	65.13	63.42	103	9

* These hours are based only on savings possible through the use of larger machinery. As discussed on page 20, these savings are estimated to be 4.0 hours per acre for horse power and 0.6 hours per acre for tractor power below the usual hours presented in Table 6 on page 18. They do not consider possible labor savings through a change of harvesting method.

farms included in this study, 16 for the medium-sized farms, and 18 for the large farms.

Method of Scoring Individual Farms.—The score for an individual farm is based on how the labor requirements on that farm compare with the lowest probable requirements as shown by the experience of farmers interviewed.

In scoring farms using tractor power, both 10-point items under "Labor Requirements" on the score card are figured in one operation. First, the farmer determines his average labor requirements. Next, he computes the lowest probable hours for his farm by adding to his usual chopping, hoeing, and harvest requirements 5.4 hours for preharvest machine hours. He next compares the two totals and rates them as indicated in Table 8.

In scoring farms using horse power, the two 10-point score items must be figured separately. The first item is figured by comparing the farm's labor requirement with the lowest probable using horse power. The lowest probable hours with horsepower is computed by adding 14.2 hours to his usual hours for chopping, hoeing, and harvest. The second item is figured by comparing the farm's labor requirement with the lowest probable using tractor power. The lowest probable hours with tractor power is computed by adding 5.4 hours to his usual hours for chopping, hoeing, and harvest. The ratings for each comparison are then added to determine the score out of the possible 20 points.

Appendix Table 1.—Planting Seed, Seed Treatment and Rate of Seeding, Southeastern Oklahoma, 1947. (Percent, except where indicated)

Item	Small Farms	Medium Farms	Large Farms
Number of farms	25	31	25
Acres of cotton planted	148	484	1489
Pounds seed used per acre for planting and replanting	21	21	24
Seed per acre for planting (seeding rate)			
Pounds delinted seed	14	11	19
Pounds non-delinted seed	20	22	23
Purchased seed:			
Proportion of farmers using	64	74	84
Proportion of acreage planted	61	71	70
Proportion of purchased seed:			
Delinted	13	21	59
Treated	97	81	91
Proportion of home-grown seed:			
Delinted	0	0	1
Treated	0	0	31
Proportion of purchased seed by varieties:			
Rowden Improved	53	39	31
Deltapine	3	37	44
Mebane	18	11	9
Stoneville	19	0	11
All other*	7	13	5
Proportion of home-grown seed by varieties:			
Rowden Improved	48	32	72
Deltapine	30	5	15
Mebane	22	20	7
Stoneville	0	43	4
All other**	0	0	2
Years from breeder:			
Purchased seed			
Proportion 1 year (direct breeder)	100	84	100
2 years from breeder	0	16	0
Home-grown seed			
Proportion 2 years (increased seed)	47	21	73
3 years from breeder	45	51	0
Over 3 years from breeder	0	28	27
Not known	8	0	0

* All other purchased seed: Small farms, Half and Half—7 percent; Medium farms, Lankhart—5 percent, Delfos—5 percent, Half and Half—2 percent, North Star—1 percent; Large farms, Lankhart—3 percent, Cobb—2 percent.

** All other home-grown seed: Large farms, Half and Half, 2 percent.

Appendix Table 2.—Fertilizer Practices by Size of Farm, Southeastern Oklahoma, 1947.

Item	Unit	Small Farms	Medium Farms	Large Farms
Farms	Number	25	31	25
Cotton planted	Acres	148	484	1489
Proportion using complete fertilizer only:				
Farms	Percent	28	29	4
Acreage	Percent	29	23	3
Proportion using Superphosphate only:				
Farms	Percent	0	3	0
Acreages	Percent	0	3	0
Rate of application per acre:				
Complete Only				
Per acre fertilized	Pounds	147	126	200
Per acre planted*	Pounds	43	29	6
Superphosphate Only				
Per acre fertilized	Pounds	0	131	0
Per acre planted*	Pounds	0	4	0
Analysis:				
Proportion acreage using:				
4-12-4	Percent	24	16	0
5-10-5	Percent	5	5	3
6-10-4	Percent	0	2	0
Summary of fertilizer elements:				
Nitrogen				
Per acre fertilized	Pounds	6.2	5.3	10.0
Per acre planted*	Pounds	1.8	1.2	.3
Phosphorus				
Per acre fertilized	Pounds	16.8	15.9	20.0
Per acre planted*	Pounds	4.9	4.1	.6
Potash				
Per acre fertilized	Pounds	6.2	5.2	10.0
Per acre planted*	Pounds	1.8	1.2	.3

* Total amount of fertilizer used on cotton divided by total acres of cotton planted by all farmers in each group.

Appendix Table 3.—Number of Years During Last 10 Poison Was Used, Southeastern Oklahoma, 1947.

(Percent)

Number years poison used during last 10	Small Farms	Medium Farms	Large Farms
0	96	75	36
1	0	3	16
2	4	16	4
3	0	3	16
4	0	3	8
5	0	0	4
7	0	0	4
8	0	0	4
9	0	0	4
10	0	0	4

Appendix Table 4.—Poison Practices, Southeastern Oklahoma, 1947
(Percent, except where indicated)

Item	No. or percent
Farms (number interviewed)	81
Cotton planted on these farms (acres)	2121
Proportion of total cotton acreage poisoned with	(36.9)*
Calcium arsenate	34.7
Arsenate and sulfur	2.4
Sulfur	10.4
Paris Green	9.9
Paris Green and Arsenate	1.1
DDT	.3
Proportion of farmers using poison	21.0
Calcium Arsenate	18.5
Arsenate and sulfur	2.5
Sulfur	3.7
Paris Green	3.7
Paris Green and arsenate	1.3
DDT	1.2
Application per acre once over (pounds)	
Calcium arsenate	8.5
Arsenate and sulfur	9.6
Sulfur	10.0
Paris Green	10.1
Paris Green and Arsenate	8.0
DDT	9.0
Proportion of total cotton acreage poisoned	36.9
2 times	12.2
3 times	9.0
4 times	8.9
5 times	6.8

* Will total to more than 36.9 percent because some farmers used more than one type of material.

Appendix Table 5.—Cotton Harvesting Practices, Southeastern Oklahoma, 1947.

Item	Small Farms	Medium Farms	Large Farms
Number of farms	25	31	25
Acres harvested	148	484	1457
Bales produced	47.4	187.8	746.0
Pounds lint yield per acre	153	186	245
Percent of cotton:			
Hand picked	92	88	86
Hand snapped	8	12	14
Percent of cotton hand picked by:			
Family labor	72	40	23
Hired labor	28	60	77
Percent of cotton hand snapped by:			
Family labor	25	39	7
Hired labor	75	61	93
Pounds seed cotton and trash per bale:			
Hand picked	1440	1396	1416
Hand snapped	1975	1932	2071
Pounds cotton seed per bale:			
Hand picked	853	827	821
Hand snapped	900	859	833

Appendix Table 6.—Operations performed, labor and power used per acre of Cotton, Southeastern Oklahoma, 1947; Major Source of Power—Horses, 40 farms

Operation and size of equipment	Proportion of farmers reporting*	Proportion planted acres covered*	Times Over	Labor and Power					
				Per acre covered			Per acre planted		
				Man	Horse	Tractor	Man	Horse	Tractor
	Percent	Percent		Hours	Hours	Hours	Hours	Hours	Hours
Cutting stalks:	(30)	(31)							
1-row cutter	30	31	1.00	1.25	2.50	----	.39	.78	----
Disc Harrowing:	(22)	(24)							
4-foot	10	7	1.67	1.25	2.50	----	.15	.30	----
6-foot	(8)	(8)							
With 2 horses	5	4	1.67	1.30	2.60	----	.09	.18	----
With 4 horses	3	4	2.00	1.30	5.20	----	.10	.40	----
7-foot (4-H)	2	4	1.00	1.00	4.00	----	.04	.16	----
7-foot (Tractor)**	2	5	1.00	.50	----	.50	.02	----	.02
Flat Breaking:	(72)	(69)							
2-horse plow	65	57	1.03	4.55	9.10	----	2.67	5.34	----
4-horse plow	2	2	1.00	2.50	10.00	----	.05	.20	----
Tractor, 2 plow**	3	5	1.00	1.25	----	1.25	.06	----	.06
Tractor, 3 plow**	2	3	1.00	.90	----	.90	.03	----	.03
Tractor, 3 Disc**	(2)	2	1.00	1.00	----	1.00	.02	----	.02
Bedding:	(95)	(95)							
1-row cultivator	13 (10)	13 (17)	1.00	1.25	2.50	----	.38	.76	----
2-horse lister	75	73	1.71	1.67	3.34	----	2.08	4.16	----
3-horse lister	5	5	1.64	1.50	4.50	----	.12	.36	----
Ga. stock, 1-horse	2	4	1.00	1.67	1.67	----	.07	.07	----
Harrow or cultivate before planting:	(72)	(62)							
1-section harrow	5 (3)	5 (3)	1.00	1.00	2.00	----	.08	.16	----
2-section harrow	40	32	1.17	.80	1.60	----	.30	.60	----
Tractor, 4-section**	2	5	1.00	.20	----	.20	.01	----	.01
1-row cultivator	10 (2)	9 (1)	1.00	1.25	2.50	----	.12	.24	----
Go-Devil	(2)	(1)	1.00	1.25	2.50	----	.01	.02	----
Ga. Stock (1-H)	(12)	(10)	1.00	1.50	1.50	----	.15	.15	----
Log Drag (1-H)	5	3	1.00	1.25	1.25	----	.04	.04	----
Log Drag (2-H)	10 (2)	8 (2)	1.10	1.00	2.00	----	.11	.22	----
Fertilizing	(18)	(15)							
1-row (1-H)	15	11	1.00	1.50	1.50	----	.16	.16	----

Operation and size of equipment	Proportion of farmers reporting*	Proportion planted acres covered*	Times Over	Labor and Power: Per acre covered — Man	Horse	Tractor	Per acre planted — Man	Horse	Tractor
	Percent	Percent		Hours	Hours	Hours	Hours	Hours	Hours
2-row comb. with planter	3	4	1.00		(Combined with planting)				
Planting:	(100)	(100)							
1-horse (1-row)	60	53	1.00	1.50	1.50	----	.80	.80	----
2-horse (1-row)	38	43	1.00	1.43	2.86	----	.61	1.22	----
2-horse (2-row)	2	4	1.00	1.00	2.00	----	.04	.08	----
Replanting:	(8)	(8)							
1-horse (1-row)	5	6	1.00	1.50	1.50	----	.09	.09	----
2-horse (2-row)	3	2	1.00	1.00	2.00	----	.02	.04	----
Cultivating:	(100)	(100)							
1-row cultivator	100	100	4.52	1.67	3.34	----	7.55	15.10	----
2-section harrow	(10)	(8)	1.00	1.00	2.00	----	.08	.16	----
2-row log	(3)	(4)	1.00	1.25	2.50	----	.05	.10	----
1-row scratcher	(2)	(2)	1.00	1.67	3.34	----	.03	.06	----
Ga. stock (1-H)	(2)	(4)	1.00	4.00	4.00	----	.16	.16	----
Chopping and hoeing:	(98)	(96)							
Hand	98	96	1.95	8.00	----	----	14.98	----	----
Poisoning:	(3)	(2)							
Hand	3	2	2.00	1.67	----	----	.07	----	----
Total Preharvest							31.73	32.11	.14
Harvesting:	(100)	(100)							
Hand picked (169 lbs. lint per acre)	100	95		28.97	----	----	27.52	----	----
Hand snapped (210 lbs. lint per acre)	(12)	5		29.40	----	----	1.47	----	----
Hauling:	(100)	(100)							
Truck (1 bale)	10 (2)	8		1.19	----	1.19	.10	----	.10
Auto-trailer (1-bale)	7	5		.98	----	.98	.05	----	.05
Wagon and team (1 bale)	58	55		2.35	4.70	----	1.29	2.58	----
Custom	(25)	(32)							
1 bale truck	22 (3)	30		1.00	----	1.00	.30	----	.30
2 bale truck	3	2		.70	----	.70	.01	----	.01
Total							62.47	34.69	.60†

* Numerals in parentheses within the column are totals. Numerals in parentheses to right of a figure in the column indicate two or more machines

Appendix Table 7.—Operations performed, labor and power used per acre of Cotton, Southeastern Oklahoma, 1947; Major Source of Power—Tractor, 41 farms.

Operation and size of equipment	Proportion of farmers reporting*	Proportion planted acres covered*	Times Over	Labor and Power					
				Per acre covered			Per acre planted		
				Man	Horse	Tractor	Man	Horse	Tractor
	Percent	Percent		Hours	Hours	Hours	Hours	Hours	Hours
Cutting or dragging stalks:	(37)	(53)							
2-row cutter	32	49	1.00	.40	----	.40	.20	----	.20
2-section harrow	3	1	1.00	.33	----	.33	**	----	**
1-row cutter (horse drawn)	2	3	1.00	1.25	2.50	----	.04	.08	----
Disc Harrowing	(83)	(83)							
4-foot disc	(5)	(7)	1.00	1.25	----	1.25	.09	----	.09
5-foot disc	22	14	1.59	.67	----	.67	.15	----	.15
6-foot disc	7	7	2.68	.60	----	.60	.11	----	.11
7-foot disc	42	40	1.46	.50	----	.50	.29	----	.29
8-foot disc	12	22	2.12	.50	----	.50	.23	----	.23
Flat Breaking	(73)	(64)							
1- plow	3	3	1.00	2.00	----	2.00	.06	----	.06
2-plow	(61)	(50)							
12"	15	7	1.08	1.43	----	1.43	.11	----	.11
14"	46	43	1.05	1.25	----	1.25	.56	----	.56
3-plow	2	2	1.00	.90	----	.90	.02	----	.02
2-disc	2	4	1.00	1.30	----	1.30	.05	----	.05
3-disc	5	5	1.17	1.00	----	1.00	.06	----	.06
Bedding	(80)	(88)							
2-row lister	56	66	1.29	.50	----	.50	.43	----	.43
3-row lister	2	2	1.00	.37	----	.37	.01	----	.01
2-row cultivator	22 (2)	20 (2)	1.11	.50	----	.50	.12	----	.12
Harrow or cultivate before planting	(83)	(86)							
2-section harrow	29	33	1.16	.33	----	.33	.13	----	.13
3-section harrow	7	8	1.00	.25	----	.25	.02	----	.02
4-section harrow	21	17	1.02	.20	----	.20	.03	----	.03
2-row cult.	26 (6)	28 (4)	3.10	.45	----	.45	.45	----	.45
Fertilizing	(10)	(5)							
2-row	3	3	1.00	.50	----	.50	.02	----	.02
2-row comb. with planter	7	2	1.00	Combined with planting					

Operation and size of equipment	Proportion of farmers reporting*	Proportion planted acres covered*	Times Over	Labor and Power: Per acre covered — Man	Horse	Tractor	Per acre planted — Man	Horse	Tractor
	Percent	Percent		Hours	Hours	Hours	Hours	Hours	Hours
Planting	(100)	(100)							
2-row	100	100	1.00	.50	----	.50	.50	----	.50
Replanting	(17)	(21)							
2-row	17	21	1.00	.50	----	.50	.10	----	.10
Cultivating	(100)	(98)							
2-row cult.	100	98	5.35	.50	----	.50	2.62	----	2.62
2-section harrow	(5)	(3)	1.00	.33	----	.33	.01	----	.01
3-section harrow	(2)	(1)	1.00	.25	----	.25	**	----	**
Chopping and hoeing	(100)	(97)							
Hand	100	97	2.00	8.00	----	----	15.52	----	----
Poisoning	(34)	(45)							
Plane	5 (2)	9 (2)	3.27	.01	----	----	**	----	----
4-row	5	3	2.53	.40	----	.40	.03	----	.03
5-row	7	13	3.64	.33	----	.33	.16	----	.16
6-row	17	20	3.16	.25	----	.25	.16	----	.16
Total preharvest							22.28	.08	6.72
Harvesting:	(100)	(98)							
Hand picked (246 lbs. lint per acre)	93	81		42.17	----	----	34.16	----	----
Hand snapped (194 lbs. lint per acre)	7 (7)	17		27.16	----	----	4.62	----	----
Hauling	(100)	(98)							
Truck (1 bale)	34	36		2.13	----	2.13	.77	----	.77
Truck (2 bales)	7	11		1.13	----	1.13	.12	----	.12
Truck-trailer (2-bales)	7	15		1.21	----	1.21	.18	----	.18
Auto-trailer (1 bale)	5	2		.82	----	.82	.02	----	.02
Tractor-trailer (1 bale)	22 (2)	12		2.19	----	2.19	.26	----	.26
Tractor-trailer (2 bales)	10	12		1.23	----	1.23	.15	----	.15
Team and wagon (1 bale)	3 (2)	4		3.13	6.26	----	.13	.26	----
Custom (truck, 1 bale)	12	6		1.78	----	1.78	.11	----	.11
Total							62.80	.34	8.33†

* Numerals in parentheses within the column are totals. Numerals in parentheses to right of a figure in the column indicate two or more machine