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Farm Adjustment Opportunities on Fine-Textured Soils of Southwestern Oklahoma

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CONTENTS

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Farm Adjustment Opportunities on Fine-Textured Soils of Southwestern Oklahoma

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Farm economy in southwestern Oklahoma is tied closely to two cash crops, wheat and cotton. Events during the past several years have greatly affected the income and farming operations involving these crops. During and immediately following World War II, the acreage of wheat increased substantially, while the acreage of cotton declined. At the same time, farms increased in size and wheat production became completely mechanized. In recent years, acreage allotments have reduced the acreages planted to these crops. Income opportunities have been further reduced by lower prices for wheat and cotton and rising cost of items used in farm production.

This bulletin reports results of a study designed to provide information that will help farmers adjust their resources and make more profitable use of non-allotment-diverted acres. The data developed were used to analyze present farming systems and to compare possible alternative systems. The information contained in the bulletin should be useful in the Rural Development Program.

How the Study Was Made

The information presented here is applicable to the "hard land" farms, with their predominantly fine-textured heavy soils, of southwestern Oklahoma. Fifty farmers in the area were interviewed to obtain complete and detailed information on crop and livestock practices, yields, and other important phases of farm operations. Most of the visits were made in Kiowa County, which is located in the geographical center of southwestern Oklahoma (Figure 1).

The farms surveyed were selected on the basis of usual size and type for the area. The information necessary in selecting the farms

Research reported herein was done under Oklahoma Agricultural Experiment Station projects 1040 and 822.

was determined from detailed county soil maps and from county Agricultural Stabilization and Conservation offices.

After the 50 farmers had been interviewed and the data analyzed, two representative farms were selected for more intensive study. Individual visits were made to these two farms by economists, soil technicians, agronomists, animal scientists, and agricultural engineers. Information obtained during these visits furnished the background for determining possible alternative land uses and farming systems.

The "budget" method of analysis was used to determine the probable income effects of changes in enterprises and in production practices. Inputs of labor and capital were balanced against probable returns from crops and livestock. Returns resulting from changes in relative acreages and numbers of different crop and livestock enterprises were calculated. The suggested changes were discussed with many persons and groups in the area—farmers, county agents, farm machinery dealers, cotton gin and elevator operators, and feed and seed dealers.

Location and Description of Area

The rolling plains wheat and cotton area of southwestern Oklahoma comprises most of 11 counties and parts of five others that lie chiefly in the subhumid rainfall zone (Figure 1). Wide differences in farming systems and crop adaptability are due to variations in soils from sands to "tight" clays and in topography from level to steeply rolling. Cotton is of greatest importance on the sandier soils, while wheat has been of relatively greater importance on the fine-textured

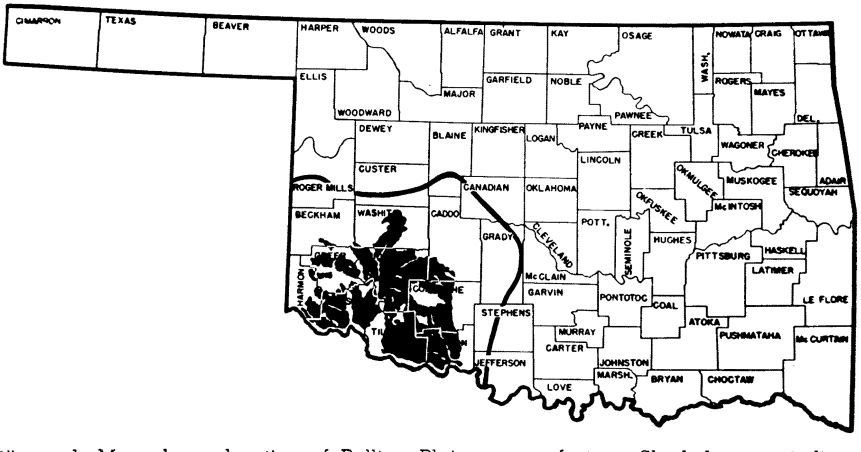

Figure 1. Map shows location of Rolling Plains area of state. Shaded areas indicate location of Foard-Tillman soils.

soils. This major agricultural section of Oklahoma has in recent years included about 23 percent of Oklahoma's wheat acreage and 68 percent of its cotton acreage. Both cotton and wheat are grown on most of the cash crop farms in the area.

Soils of Southwestern Oklahoma

Most of the soil associations in the area are in the Western (Rolling Red) Plains grouping, although some soils in the eastern part of the area are in the Central (Reddish) Prairies. A granite mountain area lies in Comanche and Kiowa counties, and some Cross Timber soils are found in Caddo and Grady counties. The most important of the Plains soils are found within the Tillman-Vernon and Foard-Tillman soil associations. These soils account for about 2,500,000 acres of farmland in the area, or about 45 percent of all land in farms. Approximately 1,500,000 acres of these soils in southwestern Oklahoma are in cropland, or 54 percent of the cropland in the area (Figure 1). The Foard and Tillman soils are brown silt and clay loam soils with clayey subsoils on clay beds, which developed under mid and short grasses. The surface soil extends to a depth of 4 to 8 inches, where it grades into a clay subsoil that is usually plastic when wet and hard when dry. Kiowa County was selected as the major sampling area for the study because of the relatively greater importance of hard lands as compared to other counties in the area. Approximately 95 percent of the land in farms in Kiowa County is characterized by fine-textured soils, and about 75 percent of these soils are found within the Foard-Tillman and Tillman-Vernon soil associations. Therefore Kiowa County was chosen as the sampling area most likely to typify present agriculture and adjustment problems on the hard lands of southwestern Oklahoma.

Agricultural Trends in Kiowa County

The percentage of land in farms or in cropland in Kiowa County has changed very little since 1930 (Table 1). Some cropland has been shifted to pasture, and some cropland abandoned over the period has been replaced by the plowing up of small acreages of the better pastureland. About 60 percent of the farmland was in cropland in 1954; this was only slightly less than in 1930. Although the acreage of cropland actually harvested in any one year depends to a great extent on weather, crops were harvested from 88 percent of the cropland acreages in the dry year of 1954.

The acreage of wheat in the area has increased greatly; 249,000 acres were harvested in 1949 compared with 90,000 acres in 1929. In

TABLE 1.—AGRICULTURAL TRENDS IN KIOWA COUNTY, OKLAHOMA, 1930-54

Item	Unit	1930	1940	1950	1954
Land Use:					
All land in farms	1,000 acres	605	622	601	614
Cropland[1]	1,000 acres	386	353	369	352
Cropland harvested	1,000 acres	379	290	336	309
Percent of farmland in cropland	Percent	63.8	56.8	61.4	57.3
Major crops:[2]					
Wheat	1,000 acres	90	136	249	177
Cotton	1,000 acres	229	73	50	66
Oats	1,000 acres	16	23	12	24
All hay	1,000 acres	5	7	12	20
Sorghums	1,000 acres	26	18	9	13
Major livestock:					
All cattle and calves	1,000 head	26	34	37	39
All cows, 2 years and older	1,000 head	14	18	18	21
Milk cows	1,000 head	11	12	6	3
Number of farms	Number	3,532	2,602	1,870	1,642
Average size of farm	Acres	171.2	238.9	321.6	374.1
Number of tractors	Number	993	1,558	2,249	2,509
Population:					
Total	1,000 persons	30	23	19	[3]
Farm	1,000 persons	18	12	7	[3]

[1] For comparability between years, cropland includes only cropland harvested, fallow idle, or failure.
[2] Crops harvested in 1929, 1939, 1949, and 1954.
[3] Not available.
Source: U. S. Census reports.

the years since 1949, wheat acreages have been reduced because of acreage-allotment programs. The decline in the cotton acreage was slightly greater than the increase in the wheat acreage, from 229,000 acres in 1929 to 50,000 acres in 1949. However, after 1949, the acreage of cotton in the county increased, and in 1954 it had reached 66,000 acres. Wheat and cotton have accounted consistently for about two-thirds of the cropland use in the county.

The acreage of hay is increasing, and the acreage of sorghum is decreasing. The acreage of oats harvested for grain has changed little, but oats and other small grains have accounted for an increasing proportion of the hay harvested in the county.

The peak in cattle numbers occurred in 1945; otherwise, there has been little change in numbers of all cattle and calves. However, a significant shift from milk to beef-type cattle has occurred, because of a reduction in the need for home consumption of milk on farms and a decline in the number of small local distribution and processing plants

for dairy products. Hog production has been primarily for home use; and the number of sheep and lambs has fluctuated considerably, influenced by yearly changes in prospects for wheat pasture. Stock sheep have been concentrated on a relatively few farms.

Since 1930, the number of farms in the county has decreased by more than half and the average acreage per farm has more than doubled. Even though tractors were introduced into the area at an early date, the number of tractors increased by two and one-half times between 1930 and 1954. Between 1930 and 1950, the total population decreased by 37 percent and the farm population by 61 percent.

TABLE 2.—DISTRIBUTION OF FARMS BY SIZE OF FARM, KIOWA COUNTY, 1950 AND 1954

Size of farm (acres)	1950		1954	
	Number	Percent	Number	Percent
0-99	253	13.5	221	13.4
100-179	535	28.6	367	22.3
180-259	213	11.4	193	11.8
260-499	579	31.0	509	31.0
500-999	223	11.9	267	16.3
1,000 and over	67	3.6	85	5.2
All farms	1,870	100.0	1,642	100.0

Source: U.S. Census reports.

The number of farms containing fewer than 500 acres decreased, and the number of farms with 500 acres or more of total land increased (Table 2). The greatest decrease in number of farms occurred in the 100 to 179-acre group.

Most of the farms in Kiowa County are classified by the census as commercial farms. However, between 1950 and 1954, the number of part-time and residential farms increased, while the number of all farms decreased. As most farms in Kiowa County grow both cotton and wheat, the chief type classification is the field crops grouping which includes both cotton and cash grain farms (Table 3). Not shown is the census breakdown of field-crop farms between cotton and cash grain (wheat) farms. The importance of wheat to farm income has increased in the county, but the considerable increase in number of cash grain farms and the decrease of more than half in the number of cotton farms between 1950 and 1954 are explained more by the very low cotton yields in the drought year of 1954 than by an actual shift in farm types. Although the total number of field-crop farms declined between 1950 and 1954, the proportion of all commercial farms in this classification increased. The greatest relative declines in number of farms by type was

TABLE 3.—DISTRIBUTION OF FARMS BY TYPE OF FARM, KIOWA COUNTY, 1950 AND 1954

Type of farm	1950		1954 [1]	
	Number	Percent	Number	Percent
Commercial:				
Field crops	1,156	61.8	1,006	61.3
General	340	18.2	274	16.7
Livestock	205	11.0	125	7.6
Dairy	26	1.4	30	1.8
Poultry	5	.3	15	.9
Other	1	–	–	–
Total	1,733	92.7	1,450	88.3
Other farms[2]	137	7.3	192	11.7
Total	1,870	100.0	1,642	100.0

[1] 1954 numbers by types reported by census adjusted to total number of farms in county.
[2] Part-time and residential farms.
Source: U.S. Census reports.

in the livestock group. Dairy and poultry farms increased in number.

Climate of Southwestern Oklahoma

Significant differences in quantity and distribution of annual rainfall are characteristic of southwestern Oklahoma. The long-time average annual rainfall for Hobart is 24.59 inches. From 1948 to 1957, rainfall at Hobart averaged 22.91 inches, varying from a high of 37.71 inches in 1957 to a low of 13.94 inches in the drought year of 1954. About 70 percent of the rain falls from April to October, inclusive. Kiowa County has a frost-free season of approximately 208 days, extending from April 8 to November 2. The long-time average January temperature reading is 39 degrees and the average July reading is 84 degrees. Extremes have included a minimum of 11 degrees below zero and a maximum of 117 degrees above zero.

Comparison of Present and Alternative Farming Systems

Present Farm System

The typical farm in the area studied contains 480 acres of land with 360 acres of cropland (Table 4). It has 110 acres of native pastureland and 10 acres of roads, waste, and farmstead. On this cash crop farm, the 1958 wheat allotment is 180 acres, 50 percent of the total cropland, and the 1958 cotton allotment is 45 acres, 12½ percent of the total cropland. Approximately 59 acres, or 16 percent of the total cropland,

TABLE 4.—CROPLAND AND LIVESTOCK ORGANIZATIONS FOR PRESENT AND ALTERNATIVE SYSTEMS

Item	Present system and practices	Alternative systems—with improved practices				
		With wheat-cotton acreage allotments (1958 level)			With no acreage allotments	
		Wheat-cotton oats (System 1)	Wheat-cotton fallow (System 2)	Wheat-cotton beef cattle (System 3)	Wheat-cotton (System 4)	Beef cattle (System 5)
Land Use:			Acres			
Cropland	360	360	360	360	360	360
Native pasture	110	110	110	110	110	110
Other land	10	10	10	10	10	10
Total land	480	480	480	480	480	480
Cropland organization:						
Wheat	180	180	180	180	264	-
Cotton	45	45	45	45	62	-
Oats for grain	34	105	-	-	-	-
Small grain hay	17	-	-	20	-	83
Seeded pasture:[1]						
Sudan	25	9	9	32	9	95
Blue Panic	-	9	9	33	9	100
Small grain	-	-	-	38	-	82
Cultivated fallow	59	12	117	12	16	-
Livestock organization:			Number			
Milk cows	2	2	2	2	2	2
Beef cows	13	-	-	32	-	73
Yearlings	2	-	-	5	-	11
Bulls	1	-	-	2	-	3
Calves raised	13	2	2	31	2	68
Calves bought	-	27	27	-	27	-
Hens	40	40	40	40	40	40

[1]To be grazed out. Blue Panic harvested for seed twice in 5 years.

are cultivated fallow, and the remaining acreage is divided between oats, hay, and seeded pasture crops. The cattle enterprise consists of 13 beef cows, 2 milk cows, 2 yearling heifers, and 1 beef-type bull. The poultry flock consists of about 40 hens.

The typical labor force is composed of the operator with help from one or two other family members during school vacations and peak labor periods. On an annual basis, labor force is equal to about 1.2-man equivalents; it varied considerably by months. In general, farms under discussion are well-managed, but their operators face problems of adjustment because of planting restrictions on wheat and cotton and the price-cost relationship.

Alternative Farming Systems

Five alternatives to the present system were evaluated for the

representative farm. Wheat and cotton acreage allotments, price supports, and other features associated with the 1958 agricultural program were assumed for three of the alternative systems. These three systems are referred to as "alternatives under allotments." No acreage allotments or price supports were assumed for two of the systems. These systems are referred to as "alternatives with no allotments." Also, an evaluation of income possibilities of adding land to the present farm unit was applied to four of the suggested alternative systems.

In estimating income and expenses from the first three alternative systems, 1958 prices for products sold and items bought were used, whereas projected prices were used in calculating the income expectancy from the "alternatives with no allotments." Projected prices for wheat and cotton are somewhat less than 1958 prices, and projected hired wage rates and prices of some other purchased items are higher than for 1958. Details of these prices and costs are shown in Appendix Table 10.

As in the present system, 360 acres of cropland, 110 acres of permanent pasture, and 10 acres of roads, farmstead, and waste were assumed for all systems. The permanent pastureland is not considered suitable for crops. This is about the usual proportion of cropland to pastureland in the area. A minimum of 18 acres of seeded pasture divided equally between Sudan and Blue Panic, to supplement the permanent pasture, and a minimum of 12 acres of cultivated fallow were assumed for all systems except system 5, the Beef Cattle system. System 5 has no fallow acreage, (see Table 4).

Construction of widely spaced, broad-based terraces to prevent erosion on 90 acres of cropland was assumed for all alternative systems. All systems involve the use of improved crop and livestock production practices and the average yields associated with such practices.

Alternatives under Allotments. The three systems using crop acreage allotments use all wheat and cotton acreages allowed under the acreage-control program. The difference between the three systems occurs only in the way in which 135 acres of the cropland are managed. The three systems are as follows:

System 1, Wheat-cotton-oats

180 acres wheat	45 acres cotton	105 acres oats 18 acres seeded pasture 12 acres cultivated fallow

System 2, Wheat-cotton-fallow

		18 acres seeded pasture
180 acres wheat	45 acres cotton	117 acres cultivated fallow

System 3, Wheat-cotton-beef cattle

		103 acres seeded pasture
180 acres wheat	45 acres cotton	20 acres hay
		12 acres cultivated fallow

In systems 1 and 2, weanling steer calves are bought in September and October and sold about 12 months later. System 3 is a cow-calf enterprise (Table 4).

Alternatives with No Allotments. Systems 4 and 5 were established assuming no wheat or cotton acreage allotments. In system 4, most of the cropland is devoted to wheat and cotton. This system is the same as systems 1 and 2, except for 105 acres which are divided as follows: 84 acres wheat, 17 acres cotton, and 4 acres fallow. Steer calves are bought to use the pasture.

In system 5, all cropland is devoted to production of hay and pasture, which is used by a "cow-calf" beef enterprise (Table 4).

Labor and Power Requirements

Both labor needed and labor available are necessary considerations in any kind of farm-adjustment planning. Estimates for the several enterprises were used in obtaining total labor requirements for the various systems. Labor for contract combining, hauling, hay baling, and cotton harvesting were not included in the totals. General overhead labor was estimated to be 5 percent of total crop and livestock requirements. Crop and livestock requirements include an allowance for labor involved in tractor and machinery maintenance and repair, and for such livestock-related jobs as fence moving and repair.

Monthly or seasonal labor requirements for the alternative farming systems are more important to farmers than total requirements because seasonal requirements indicate points of greatest labor needs compared with the family labor supply. For alternative systems 1 through 4, labor hired by the hour is required only in June and July to prepare the land and chop cotton. For alternative system 5, this labor is needed in May and June. Custom and contract work is concentrated in June during the wheat harvest and in October and November during cotton

TABLE 5.—ESTIMATED TOTAL HOURS OF LABOR REQUIRED FOR ALTERNATIVE SYSTEMS

Item	Present system and practices	Alternative systems—with improved practices				
		With wheat and cotton acreage allotments (1958 level)			With no acreage allotments	
		Wheat-cotton oats (System 1)	Wheat-cotton fallow (System 2)	Wheat-cotton beef cattle (System 3)	Wheat-cotton (System 4)	Beef cattle (System 5)
		Hours				
Operator's family	2,068	2,045	2,065	2,357	2,101	2,693
Hired[1]	215	271	208	265	325	305
Total	2,283	2,316	2,273	2,622	2,426	2,998

[1] Excluding labor supplied in contract combining, hauling, cotton harvesting, and hay baling.

harvesting. Details of the monthly distribution of man-labor requirements are presented in Appendix Table 11.

Total and hired-labor requirements differ little as between the present system and system 2 (Table 5). System 1 requires slightly more than 50 hours of additional hired labor. System 3 requires about 300 hours more operator and family labor and 50 hours more hired labor than the present system. Of the systems without allotments, system 4 requires almost 150 hours more total labor and 110 hours more hired labor than the present system. System 5 requires about 700 hours more total labor and 90 hours more hired labor than the present system. System 4, the wheat-cotton alternative, requires the greatest amount of custom and contract work.

Estimated tractor power requirements are greatest under system 5, 1,246 hours, and smallest under system 2 with 985 hours. Tractor power requirements and their distribution by months are shown in Appendix Table 12. Estimated cost of operating tractor is shown in Appendix Table 14.

Investment Under Different Systems

Total investment for the representative farms with the present system, excluding value of the farm dwelling, amounts to more than $60,000 (Table 6 and Appendix Table 13), using current market values for land, 60 percent of new cost for buildings and fences, one-half of list price, plus salvage value, of farm machinery and equipment, and inventory value of livestock numbers. At current market prices, land accounts for 82 percent of the total investment. Land values in southwestern Oklahoma are at an all-time high. The price of land has continued to increase even with the relatively lower farm incomes of recent years. The estimated value of land is $120 per acre for cropland and

TABLE 6.—COMPARISON OF COSTS, RETURNS, AND INVESTMENT FOR ALTERNATIVE FARMING SYSTEMS

Item	Present system and practices	Alternative systems—(with improved practices)				
		With wheat and cotton acreage allotments (1958 level)			With no acreage allotments	
		Wheat-cotton oats (System 1)	Wheat-cotton fallow (System 2)	Wheat-cotton beef cattle (System 3)	Wheat-cotton (System 4)	Beef cattle (System 5)
Investment[1]			Dollars			
Land	49,800	50,025	50,025	50,025	50,025	50,025
Buildings and improvements	2,520	2,520	2,520	2,628	2,520	2,652
Farm machinery and equipment	5,751	5,751	5.751	5,751	5,751	5,665
Livestock	2,570	3,426	3,426	5,628	3,426	12,140
Total	60,641	61,722	61,722	64,032	61,722	70,482
Cash income[2]						
Wheat	3,757	3,543	4,058	3,497	4,830	0
Cotton	2,229	2,229	2,229	2,229	2,701	0
Beef cattle	1,334	3,961	3,961	3,116	3,961	6,929
Other	469	2,117	173	413	173	1,083
Total	7,789	11,850	10,421	9,255	11,665	8,012
Cash expenses:[3]						
Crop	591	685	554	781	750	872
Livestock	375	739	739	592	739	1,042
Calves purchased	0	2,353	2,353	0	2,353	0
Custom and contract work	1,250	1,502	1,059	1,392	1,788	995
Hired labor	161	203	156	199	292	274
Tractor, truck, and machinery	1,294	1,310	1,241	1,368	1,352	1,503
Overhead and other	694	730	735	776	749	865
Total	4,365	7,522	6,837	5,108	8,023	5,551
Net cash farm income	3,424	4,328	3,584	4,147	3,642	2,461
Home-used products	341	341	341	341	341	341
Depreciation	—902	—902	—902	—902	—902	—894
Net farm income	2,863	3,767	3,023	3,586	3,081	1,908
Interest on investment at 4½ percent	2,729	2,777	2,777	2,881	2,777	3,172
Returns to operator and family labor	134	990	246	705	304	—1,264
Per hour of labor	0.06	0.49	0.12	0.30	0.14	—0.42

[1] Investment is reported in detail in Appendix Table 13.
[2] See Appendix Table 16 for details.
[3] See Appendix T[illegible] 18 for overhead and depreciation details.

$55 per acre for pasture and other land, or an average of $104 per acre. These values are based on estimates of farmers, Federal Land Bank appraisers, and others familiar with the land market in the area. These prices are much higher than the average prices most farmers paid for their land; but they represent recent land transfers and are a reasonable estimate of the price farmers would pay if they bought additional land of like productivity.

All alternative systems include a small increase, $225, in investment in land for additional terracing, but the major differences in investment among systems are due to the variations in kinds and numbers of beef cattle. System 3 requires an additional investment of almost $3,400 and systems 1 and 2 require almost $1,100 each compared with the present system. System 5 requires an additional investment of almost $10,000 compared with the present system. In general, present buildings are either adequate or may be easily adapted to the needs of the alternative systems presented. Similarly, present farm machinery and equipment items are generally adequate for any of the systems.

Comparison of Net Returns

An important step in appraising alternative systems of farming is a comparison of the returns to the operator for his labor, management, and capital from the different systems. Estimates were made of income and expenses for the present and each of the five alternative systems. A summary comparison of receipts, expenses, and net returns among alternative farming systems is shown in Table 6. Appendix Tables 14 through 18 show greater detail.

Of the three alternative systems "with allotments," **System 1** gives the highest estimated net return and **System 3** is the second most profitable. In **System 1**, most of the cropland not used for wheat and cotton is devoted to production of oats, and in **System 3** most of the cropland not used for allotment crops is used to produce pasture and hay for a cow-calf beef enterprise. Thus, with prices of 65 cents per bushel for oats and $19 per 100 pounds for beef calves, there is a difference of almost $300 in net returns to operator's labor and management in favor of **System 1.**

With other factors remaining the same, a change of $2 per 100 pounds in the price of beef calves would change the net labor and management returns from **System 3** by almost $325 and a change of 10 cents per bushel in the price of oats would change net returns from **System 1** by almost $300. Thus an increase of $2 in cattle prices, or a

decrease of 10 cents per bushel in the price of oats, would make the net returns from the two systems about the same.

Another phase of the analysis indicates that if the "buy-sell" steer program used in **System 1** were substituted for the cow-calf program in **System 3,** net returns from **System 3** would be increased by almost $250.

Of the two systems in which no acreage allotments are assumed, **System 4,** which has large wheat and cotton acreages, would return a considerably higher estimated net farm income than **System 5,** which is essentially a beef cattle farm. In fact, the estimated net farm income from **System 5** would be less than the interest charge computed at 4½ percent on the total capital investment. The long-term projected prices assumed for the major products are: Wheat $1.60 per bushel, cotton lint 24 cents a pound, and beef calves $19 per 100 pounds. Also, projected wage rates and prices for some other input items are assumed to be slightly higher than present rates and prices.

With other factors remaining the same, a change of 10 cents per bushel in the price of wheat would change net returns from **System 4** by almost $300, and a change of $1 per 100 pounds in the price of calves would change net returns from **System 5** by almost $390. Thus a price of about 23 cents a pound for beef calves would be needed if the returns from **System 5** were to equal those from **System 4,** and a price of about 27½ cents a pound would be needed to permit **System 5** to return 4½ percent interest on estimated capital and 75 cents per hour to operator and family labor.

The estimated net returns to labor and management of about $300 from **System 4** is nearly $700 less than from **System 1.** As indicated previously, the projected cost rates on some input items are slightly higher than the 1958 rates. Because of these higher cost rates, estimated expenses for **System 4** are about $200 higher than they would have been with 1958 cost rates. If an adjustment is made for this difference in cost rates, there is a difference of about $500 in the net returns to the operator's labor and management.

This indicates that under the assumed conditions a system with no wheat or cotton acreage allotments, with wheat prices at $1.60 per bushel and cotton lint at 24 cents a pound, would be less profitable than a system with wheat and cotton allotments at 1958 levels, but with the acreage of oats not controlled, and with wheat at $1.70 a bushel, cotton at 28 cents a pound, and oats at 65 cents a bushel.

All of the systems are characterized by low residual returns to labor and management furnished by the operator and his family. The

residual return per hour of labor provided by the operator and his family is considerably less than the rate of 75 cents per hour customarily paid in the area for hired farm labor. This situation is critical for a farmer who must pay rather large annual interest and principal payments. Even if the operator has 100 percent equity, the amount of money available to the farmer and his family to maintain the farm dwelling, pay other living expenses, and provide any savings, ranges from $2,863 for the present system to $3,767 for **System 1.** For the systems without allotments, $3,081 would be available from the wheat-cotton system but only $1,908 from the beef cattle system.

Effect on Income of Adding Land

Part of the operator and family labor, as well as the tractor power and machinery, would be unused on a 480-acre farm with the alternative systems considered in the previous sections of this report. The pur- 160 acres of comparable land for selected alternative farming systems. The analysis assumes similar crop and livestock combinations and also that present machinery and building facilities are adequate for farming pose of this section is to appraise the income effect of the addition of additional land except for specified items (Table 7).

The chief investment required is for the purchase of additional land at an average of $104 per acre—approximately $120 per acre for cropland and $55 per acre for pasture and other land. Additional investment in buildings and equipment is relatively small; it consists mainly of fencing. Beef cattle systems would require additional capital for livestock.

Much of the additional labor required in the peak months of June, July, October, and November must be hired. Labor required for additional cotton harvesting is not included in the additional hours of labor needed; it is charged at the specified rates for hand snapping of 60 percent and for custom stripping of 40 percent of the cotton produced.

The estimated returns to labor and management are approximately the same for **Systems 1** and **3.** But **System 3** requires 100 hours more operator and family labor than **System 1** (Table 7). The return of $749 to labor and management for the additional 160 acres of land is about three-fourths of the $990 return to the first 480 acres of land owned, or more than twice the return per acre of the original land, (Tables 5, 6 and 8). This may be one of the important reasons for the relatively high land prices in the area. The $749 return to labor and management for the additional 160 acres is $419 more than the $330 return for each quarter section of the first 480 acres. The $419 advantage (marginal return) to

TABLE 7.—CROP ACREAGES, LIVESTOCK NUMBERS, INVESTMENTS, AND LABOR REQUIREMENTS FOR AN ADDITIONAL 160 ACRES OF OWNED OR RENTED LAND, BY ALTERNATIVE FARMING SYSTEMS

Item	Alternative systems (with improved practices)			
	With wheat-cotton allotments (1958 level)		With no acreage allotments	
	Wheat-cotton-oats (System 1)	Wheat-cotton-cattle (System 3)	Wheat-cotton (System 4)	Beef cattle (System 5)
	Acres			
Wheat	60	60	88	—
Cotton	15	15	22	—
Oats, grain	35	—	—	—
Oats, hay	—	7	—	28
Oats, grazed out	—	12	—	27
Blue Panic	3	11	3	33
Sudan	3	11	3	32
Cultivated fallow	4	4	4	—
Permanent pasture	35	35	35	35
Other land	5	5	5	5
	Numbers			
Calves bought	10	—	10	—
Beef cows	—	12	—	25
	Dollars			
Investment:				
Land	16,675	16,675	16,675	16,675
Buildings & improvements	100	200	100	250
Livestock	[1]	2,140	[1]	4,430
Total	16,775	19,015	16,775	21,355
	Hours			
Labor required:[2]				
Hired	315	333	321	601
Operator & family	149	249	168	219
Total	464	582	489	820

[1] Purchase of weanling steer calves annual cash expense.
[2] Not including labor supplied with custom operations or contract work such as cotton snapping and stripping.

the fourth quarter can be explained by the difference in overhead costs when divided among more land. Depreciation of buildings and equipment amounted to $301 per quarter over three quarter-sections of land, but only $225 per quarter over four quarter-sections. Since less investment was required for four quarters than the average for the first three quarters, interest on investment would be less also. Other overhead expenses such as use of the farm truck, telephone, insurance, and so forth, would not increase in proportion to the amount of land added.

An analysis of buying versus renting the additional land indicates that the returns to the operator for labor and management would be essentially the same whether the land were purchased or rented. This

TABLE 8.—COSTS, RETURNS, AND INVESTMENT FOR AN ADDITIONAL 160 ACRES OF LAND, BY ALTERNATIVE SYSTEMS

Item	Alternative systems (improved production practices)			
	With wheat-cotton allotments (1958 level)		With no acreage allotments	
	Wheat-cotton-oats (System 1)	Wheat-cotton-cattle (System 3)	Wheat-cotton (System 4)	Beef cattle (System 5)
	Dollars			
Gross cash income:				
Wheat	1,200	1,200	1,658	—
Cotton	747	747	962	—
Other crops	701	110	30	330
Beef	1,428	1,108	1,428	2,348
Total	4,076	3,165	4,078	2,678
Cash expenses:				
Crop	988	990	1,153	911
Livestock[1]	1,088	127	1,088	267
Hired labor[2]	236	250	289	541
Overhead:				
Buildings & fence repairs	40	60	40	80
Real estate taxes	111	111	111	111
Interest on operating capital	109	46	115	77
Total	2,572	1,584	2,796	1,987
Returns above cash expenses	1,504	1,581	1,282	691
Intr. on investment at 4½%	755	856	755	961
Returns to operator's labor and family's management	749	725	527	—270

[1] Purchase of weanling steer calves annual cash expense.
[2] Labor hired for cotton harvesting included in crop expense.

assumes the share-rental arrangements customary in the area. However, no additional capital investment would be required if the land were rented, whereas nearly $17,000 additional capital would be required for **System 1** if the land were purchased at the assumed prices.

The estimated returns of about $500 to operator's labor and management for the additional 160 acres using **System 4** is about 1¾ times the returns from the original 480 acres (Compare Tables 6 and 8). This is an even more striking illustration of the effect of dividing depreciation, interest on some investment, and other overhead costs among more land. As investment charges and depreciation rates are the same for **Systems 1** and 4, the marginal return to the fourth quarter-section of land is also similar. However, the return to labor and management for the first 480 acres in **System 4** was only $304, or $100 per quarter (Table 6).

The estimated net farm returns from **System 5** are not sufficient to take care of interest on additional capital. This means that with the kind of beef-cattle system assumed in **Systems 3** and **5**, a farmer could

not afford to pay $104 per acre for land on which to operate a cow-calf beef system with the price of beef calves at $19 per 100 pounds.

This analysis of the effect of enlarging the size of the farm is valid only so far as the assumptions used are valid. An important assumption is that labor would be available at the wages indicated and that cotton could be harvested at the specified rates. There are enough mechanical cotton strippers in the area to strip all of the cotton grown should labor for hand snapping be unavailable or very high priced. Other requirements for hired labor occur primarily in June and July, months in which the seasonal supply of labor for hire is greatest.

Labor requirements on these farms could be reduced through the use of larger tractors and larger equipment. Acreages of row crops per farm on these medium-sized farms are not large enough to justify the purchase of 4-row planting and cultivating equipment, and most farmers consider that two tractors are needed to provide greater flexibility, particularly during peak periods. Farmers are buying larger tractors and equipment in increasing numbers on both 480-acre units and larger farms. The ownership of this larger equipment makes it even more desirable to expand the size of the unit.

Summary and Conclusions

Opportunities for farmers to improve income on fine-textured soils in southwestern Oklahoma are limited by relatively low prices for products sold and high prices for items used in production. Opportunities for increasing per acre yields through the use of fertilizers and crop rotations are limited. In general, efforts to increase the permeability of these soils through mechanical means have not been satisfactory, and terracing and contour farming appear to be the most desirable means of controlling erosion and conserving moisture. Therefore, present and potential crop yields on these hard land soils are low compared with yields on other soils with more favorable soil-water relationships. The only major enterprise with promise for sizeable increases in yield is oats. Oat yields can be increased through more timeliness of production operations and use of better adapted fall varieties.

The analysis indicates that farmers in southwestern Oklahoma are receiving comparatively low residual returns to labor and management provided by the operator and his family if 4½ percent interest is charged on the investment in land, buildings, and other capital at current market values.

Increasing incomes through purchase or rental of additional land has considerable promise. However, this opportunity may be limited largely to farmers who have high equities in their present lands and other investments. The use of larger tractors and machinery would allow operators to farm more land with the same available labor supply.

Future prices of farm products will have an important effect on level of incomes as well as on the relative returns among alternative farming systems. Prospects appear to be better for higher livestock prices than for higher prices for cash crops. Present (1958) cattle prices and adequate feed and forage is likely to result in increased numbers of beef cattle in the area. Although they are unlikely to replace cash crop systems, beef cattle are likely to continue to supplement income from cash crops in accordance with pasture and forage resources and the degree of acreage restrictions on cash crops.

Full-time farmers will continue to enlarge their operating units as long as returns from additional land are proportionately greater than from present land. This change in size will be aided by readily available sources of credit and the favorable equity position shared by many farmers in their present investments. A heavily indebted or beginning farmer would have little opportunity to succeed in farming in the area without nonfarm sources of income.

This analysis does not reveal a promising future for increasing farm incomes on the hard land soils of southwestern Oklahoma. But many farmers are earning a comfortable living in the area because they are relatively free of debt and have high equities in present investment. This return is termed interest on investment in this presentation. Government payments in connection with Agricultural Conservation Program practices are not included as income.

Finally, this analysis refers directly to farmers with typical claypan soils of southwestern Oklahoma. The results depend upon the assumed prices, yields, and costs used in the budgeting procedure. In a different setting of soil and farm resources, the results would be expected to differ from those presented here. The results of the study should focus attention on the serious problems faced by farmers in the area.

Appendix

1. Practices, Production and Production Requirements of Crops and Livestock

The information presented in this section is based on an evaluation of production practices and the resulting crop yields and livestock production rates reported by farmers with hard land soils. Proposed "improved practices" are based on available research results and the judgment of production specialists, farmers, and agricultural workers familiar with the area. Crop yields and livestock production rates are the average production expected to be attained through the use of practices specified in this section. These practices, yields, and production rates are used in the budgeting of alternative farming systems for farmers with hard land soils. Agricultural workers or farmers may use or adjust them in budgeting procedures to fit the needs of individual farms. As they are presented as average rates or usual requirements, information on soil conditions, climatic factors, available machinery, and so forth, would be needed to determine the specific recommendations for individual farms.

Crops

Major crops considered are wheat, cotton, oats for grain, oat hay, and the pasture crops—Blue Panic, Sudan, and small grain (see Appendix Tables 1 to 7 for specific production and production requirements). Alfalfa and grain sorghums are not adapted to these hard land soils.

In this area, crop and pasture yields are limited primarily by available moisture during the growing season. Broad-based, widely spaced terraces and farming on the contour are recommended for soil and water conservation on cropland. Tillage operations must be flexible and fitted to specific moisture conditions. The moldboard plow, one-way, and Hoeme, or tool-bar, are all used in land preparation according to the available moisture and the needs for residue management and weed control. Operators of most medium-sized farms have two tractors. Land preparation is usually performed with a 3-4 plow tractor with a draw-bar horsepower of about 35. Row-crop planting and cultivating is usually performed with a 2-plow tractor, draw-bar horsepower of about 25.0, and 2-row equipment.

Uses of Wheat

Customary production practices for wheat appear to be adequate and in line with recommendations of wheat and soils specialists. The estimated long-time average yield of wheat from continuous cropping is 12 bushels per acre. The use of cultivated fallow in a rotation preceding wheat can raise the yield to 14 bushels with 6 months fallow, and to 16 bushels with 12 months fallow. Six months fallow usually follows cotton or various summer crops in a rotation, while 12 months fallow is normal after wheat or oats. Combining and hauling are usually done on a custom basis. The peak labor and power requirements for wheat occur in June and July. Labor requirements for cultivated fallow are reported in Appendix Table 2.

In addition to grain, wheat frequently attains sufficient growth to provide livestock grazing. About 22 animal-unit days of grazing per acre are estimated to be available per year between November 15 and March 15.[1]

Year-to-year variations in rainfall and other weather conditions affect the availability and duration of wheat pasture. Wheat or other small grains may be planted and utilized for pasture only. An additional 96 animal-unit days per acre are estimated to be available from March 15 to May 15 for wheat that is pastured out rather than harvested for grain.

Uses of Cotton

Customary production practices for cotton, like those for wheat, appear to be adequate and in line with recommendations of cotton and soils specialists. One of the major problems in cotton production in southwestern Oklahoma is the high amount of labor required in October and November. These two months account for nearly two-thirds of the total labor requirements for cotton. Labor is usually contracted or hired for much of the cotton snapping and hoeing. Stripping is usually done on a custom basis.

Oat Yields Can Be Increased

Oat yields attained with present practices can be increased substantially with improved production practices. The present yield is 21 bushels compared with an expected yield from improved practices of

[1] An animal-unit day of grazing is defined as the amount of grazing necessary to maintain a 1,000-pound brood cow. Requirements for the calf would be in addition to this amount.

30 bushels per acre. Small grain specialists believe that 40 bushels per acre may be a more probable oat yield, but 30 bushels is used as an "interim" yield for purposes of this study. This increase in yield would be due entirely to earlier seeding of a recommended winter oat variety, Forkedeer or Mustang. Estimated probable pasture yields are the same as those indicated for wheat. Forkedeer is the preferable variety for pasture purposes.

Using Oat Hay

Yields of oat hay, like those of oats for grain, can also be substantially increased by introducing improved practices. The yield can be increased from 1 to 1.5 tons per acre, provided a recommended fall oat variety, Forkedeer, is seeded.

Blue Panic Shows Promise

Blue Panic shows promise as a pasture crop in southwestern Oklahoma. The expected production is 119 animal-unit days of grazing per acre with the usual grazing dates extending from June through September. A Blue Panic stand is expected to last for five years, and to provide two seed crops during that time. The expected seed yield is 50 pounds per acre at each harvest, or 20 pounds per year on a 5-year basis. Fertilizer is usually applied each year at the rate of 100 pounds of 33 percent ammonium nitrate per acre.

Sudan Needs Careful Management

Sudan provides about 98 animal-unit days of grazing per acre. A first planting provides grazing during June and July. When planted during the first part of July, grazing is available during August and September. Careful management and rotation of animals is needed to obtain the maximum amount of grazing from Sudan.

Using Native Grasses

Native pasture in Kiowa County is usually found on less productive soils with erosion hazards for cultivation and only a small proportion of the pasturelands would be adapted to use as cropland. Short grasses predominate, with Buffalo grass, blue grama, and sideoats grama most important. Recommendations for improvement are mainly in the nature of grazing management, although occasional mowing for weed control may be needed. The yield of native pasture is estimated to be 37 animal-unit days of grazing per acre per year. Native pasture can be grazed over a long period—in either the green or cured state.

APPENDIX TABLE 1.—WHEAT: AVERAGE YIELD AND USUAL PRODUCTION REQUIREMENTS

	Average per acre
Normal yield:[1]	
Continuous wheat, bushels	12
6 months fallow-wheat rotation, bushels	14
12 months fallow-wheat, bushels	16
Seed per acre, bushels	.75
Value of seed and treatment, per bushel:	
Bought, 55 percent at $3.00 per bushel, dollars	1.25
Home grown, 45 percent at $2.40 per bushel, dollars	.80

USUAL LABOR AND POWER PER ACRE

Item	Size of equipment	Acres per 10 hour day	Times over	Total hours Man	Total hours Tractor
Flatbreak	3-14 in.	13	0.33	0.25	0.25
One-way	9 ft.	32	2.0	.62	.62
Hoeme	10 ft.	32	2.0	.63	.63
Drill	16-8 in.	40	1.0	.25	.25
Harrow	3 sec.	40	1.0	.25	.25
Total preharvest				2.00	2.00
Combine	12 ft.	25	1.0	.40	—
Haul	1½ ton	30	1.0	.33	—
Total direct requirements				2.73	2.00
Usual custom operations:					
Combine			1.0 at $3.00 per acre		
Haul			$0.05 per bushel		

DISTRIBUTION OF TOTAL HOURS OF PREHARVEST LABOR AND POWER REQUIREMENTS PER ACRE[2]

	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Labor	2.40	--	--	--	--	--	1.00	0.85	--	0.10	0.35	0.10	--
Power	2.20	--	--	--	--	--	.90	.75	--	.10	.35	.10	--

[1] Wheat pasture yields include 22 animal unit days for wheat harvested for grain, and 118 for wheat grazed out in the fall and spring. One animal-unit day is the amount of grazing necessary for 1 mature brood cow or equivalent.

[2] Total preharvest requirements only. Includes 120 percent of usual man-labor requirements and 110 percent of usual power requirements. It was assumed that 20 percent additional labor above field time would be required to service equipment and move to, from, and between fields. Power requirements for this servicing and movement between fields were assumed to add 10 percent to that required for the field work itself.

APPENDIX TABLE 2.—PRODUCTION REQUIREMENTS FOR LAND CULTIVATED FALLOW, 12 MONTHS PERIOD, BEGINNING ABOUT JUNE 1[1]

USUAL LABOR AND POWER PER ACRE

Item	Size of equipment	Acres per 10 hour day	Times over	Total hours Man	Total hours Tractor
Flatbreak	3-14 in.	13	0.5	0.38	0.38
One-way	9 ft.	32	1.8	.56	.56
Hoeme	10 ft.	32	1.8	.56	.56
Total direct requirements				1.50	1.50

DISTRIBUTION OF TOTAL HOURS OF LABOR AND POWER REQUIREMENTS PER ACRE[2]

	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Labor	1.80	--	--	--	--	--	0.90	0.90	--	--	--	--	--
Power	1.65	--	--	--	--	--	.82	.83	--	--	--	--	--

6 MONTHS PERIOD, BEGINNING ABOUT DECEMBER 1[1]

USUAL LABOR AND POWER PER ACRE

Item	Size of equipment	Acres per 10 hour day	Times over	Total hours Man	Total hours Tractor
Flatbreak	3-14 in.	13	0.33	0.25	0.25
One-way	9 ft.	32	.8	.25	.25
Hoeme	10 ft.	32	1.3	.40	.40
Total direct requirements				.90	.90

DISTRIBUTION OF TOTAL HOURS OF LABOR AND POWER REQUIREMENTS PER ACRE[2]

	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Labor	1.08	0.12	0.06	0.06	0.36	0.12	--	--	--	--	--	--	0.36
Power	1.00	.11	.06	.06	.33	.11	--	--	--	--	--	--	.33

[1] 12 months period following small grains; 6 months period after cotton or other summer crops.

[2] Includes 120 percent of usual man-labor requirements and 110 percent of usual power requirements. It was assumed that 20 percent additional labor above field time would be required to service equipment and move to, from, and between fields. Power requirements for this servicing and movement between fields were assumed to add 10 percent to that required for the field work itself.

APPENDIX TABLE 3.—COTTON: AVERAGE YIELD AND USUAL PRODUCTION REQUIREMENTS

	Average per acre
Normal yield:	
Lint, pounds	150
Seed, pounds	250
Seed:[1]	
Fuzzy, pounds	25
Delinted, pounds	15
Value of seed and treatment:	
Fuzzy seed, bought, 33 percent at $10.00 cwt., dollars	0.90
Home grown, 67 percent at $5.00 cwt., dollars	.80
Delinted seed, bought 100 percent at $18.00 cwt., dollars	2.70

USUAL LABOR AND POWER PER ACRE

Item	Size of equipment	Acres per 10 hour day	Times over	Total hours Man	Total hours Tractor
Flatbreak	3-14 in.	13	0.33	0.25	0.25
One-way	9 ft.	32	.8	.25	.25
Hoeme	10 ft.	32	.8	.25	.25
Field cult. or Hoeme	10 ft.	40	2.0	.50	.50
Section harrow	3 sec.	40	1.0	.25	.25
Plant	2 row	20	1.5	.75	.75
Harrow	3 sec.	40	1.0	.25	.25
Cultivate	2 row	20	3.0	1.50	1.50
Chopping (hoeing)	Hand	4	1.0	2.50	-
Total preharvest				6.50	4.00
Snapping			1.0	9.75	-
Stripping			1.0	1.00	.50
Hauling			1.0	.75	.50
Total direct requirements				18.00	5.00
Usual Hired operations:					
Chopping	$0.75 per hour				
Snapping	2.00 per cwt.				
Mechanical stripping	1.00 per cwt.				

DISTRIBUTION OF TOTAL HOURS OF LABOR AND POWER REQUIREMENTS PER ACRE[2]

	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Labor	21.10	0.30	0.30	0.30	0.35	0.70	1.90	2.90	.30	--	7.85	5.10	1.10
Power	5.50	.25	.25	.20	.35	.65	1.25	.85	.30	--	.30	.45	.65

[1] Germination tests for planting seed are desirable to assure an adequate plant population. The amount of seed actually planted each year vary considerably because of differences in germination percentages.

[2] Except for chopping, direct labor requirements are increased by 20 percent and direct power requirements by 10 percent. It was assumed that 20 percent additional labor above field time would be required to service equipment and move to, from, and between fields. Power requirements for this servicing and movement between fields were assumed to add 10 percent to that required for the field work itself.

APPENDIX TABLE 4.—OATS FOR GRAIN: AVERAGE YIELD AND USUAL PRODUCTION REQUIREMENTS

	Present practices	Improved practices
Normal yield, bushels[1]	21	30[2]
Seed per acre, bushels	1.5	1.5
Value of seed and treatment per bushel:		
Bought, 67 percent at $1.25 per bushel, dollars	1.25	1.75
Homegrown, 33 percent at $.80 per bushel, dollars	.40	.50

USUAL LABOR AND POWER PER ACRE

Item	Size of equipment	Acres per 10 hour day	Times over	Total hours Man	Total hours Tractor
Flatbreak	3-14 in.	13	0.33	0.25	0.25
One-way	9 ft.	32	2.0	.62	.62
Hoeme	10 ft.	32	2.0	.63	.63
Harrow	3 sec.	40	1.0	.25	.25
Drill	16-8 in.	40	1.0	.25	.25
Total preharvest				2.00	2.00
Combine	12 ft.	25	1.0	.40	--
Haul	1½ ton	30	1.0	.33	--
Total direct requirements				2.73	2.00
Usual custom operations:					
Combine				1.0 at $3.00 per acre	
Haul				$ .03 per bushel	

DISTRIBUTION OF TOTAL HOURS OF PREHARVEST LABOR AND POWER REQUIREMENTS PER ACRE[3]

	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Labor	2.40	--	--	--	--	--	0.95	0.85	--	0.05	0.35	0.20	--
Power	2.20	--	--	--	--	--	.85	.85	--	.05	.30	.15	--

[1] Oats pasture yields include 22 animal-unit days for oats harvested for grain, and 118 days for oats grazed out in fall and spring. One animal-unit day is the amount of grazing necessary for 1 mature brood cow or equivalent.

[2] Interim yield, 40 bushels per acre appear to be possible with adoption of improved practices—Forkedeer or Mustang varieties recommended.

[3] Total preharvest requirements only. Includes 120 percent of usual man labor requirements and 110 percent of usual power requirements. It was assumed that 20 percent additional labor above field time would be required to service equipment and move to, from, and between fields. Power requirments for this servicing and movement between fields was assumed to add 10 percent to that required for the field work itself.

APPENDIX TABLE 5.—OATS FOR HAY: AVERAGE YIELD AND USUAL PRODUCTION REQUIREMENTS

	Present practices	Improved practices
Normal yield, tons	1	1.5
Seed per acre, bushels	1.5	1.5
Value of seed and treatment per bushel:		
Bought, 67 percent at $1.25 per bushel, dollars	1.25	1.75
Homegrown, 33 percent at $0.80 per bushel, dollars	.40	.50

USUAL LABOR AND POWER PER ACRE

Item	Size of equipment	Acres per 10 hour day	Times over	Total hours Man	Total hours Tractor
Flatbreak	3-14 in.	13	0.33	0.25	0.25
One-way	9 ft.	32	2.0	.62	.62
Hoeme	10 ft.	32	2.0	.63	.63
Harrow	3 sec.	40	1.0	.25	.25
Drill	16-8 in.	40	1.0	.25	.25
Total preharvest				2.00	2.00
Mow	7 ft.	20	1.0	.50	.50
Rake	10 ft.	20	1.0	.50	.50
Haul			1.0	1.00	.50
Total direct requirements				4.00	3.50
Usual custom operations:					
Baling			1.0 at $6.00 per ton		

DISTRIBUTION OF TOTAL HOURS OF LABOR AND POWER REQUIREMENTS PER ACRE[1]

	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Labor	4.80	--	--	--	--	0.90	2.40	0.90	--	0.05	0.35	0.20	--
Power	3.85	--	--	--	--	.80	1.65	.85	--	.05	.30	.20	--

[1] Includes 120 percent of usual man-labor requirements and 110 percent of usual power requirements. It was assumed that 20 percent additional labor above field time would be required to service equipment and move to, from, and between fields. Power requirements for this servicing and movement between fields was assumed to add 10 percent to that required for the field work itself.

APPENDIX TABLE 6.—BLUE PANIC PASTURE: AVERAGE YIELD AND USUAL PRODUCTION REQUIREMENTS

	Average per acre
Normal yield:	
Animal unit days[1]	119
Seed, pounds[2]	20
Seed per acre, pounds	2
Value of seed and treatment per pound:	
Bought, 40 percent at $0.75 per pound, dollars	0.30
Homegrown, 60 percent at $0.55 per pound, dollars	.33
Fertilizer (ammonium nitrate)	
$4.50 per cwt.	4.50

USUAL LABOR AND POWER PER ACRE

Item	Size of equipment	Acres per 10 hour day	Times over	Total hours Man	Total hours Tractor
Establishment:					
Flatbreak	3-14 in.	13	0.33	0.25	0.25
One-way	9 ft.	32	.8	.25	.25
Hoeme	10 ft.	32	.8	.25	.25
Field cult. or Hoeme	10 ft.	40	2.0	.50	.50
Harrow	3 sec.	40	2.0	.50	.50
Plant	2 row	20	1.0	.50	.50
Cultivate	2 row	20	1.0	.50	.50
Total establishment				2.75	2.75
Maintenance:					
Fertilize	2 row	20	1.0	.50	.50
Cultivate	2 row	20	1.0	.50	.50
Total maintenance				1.00	1.00
Usual custom operations:					
Rental of special grass seeder		$0.50 per acre			
Combining seed		$5.00 per acre[2]			
Hauling and cleaning seed		$0.20 per pound			

DISTRIBUTION OF TOTAL HOURS OF ANNUAL LABOR AND POWER REQUIREMENTS PER ACRE[3]

	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Labor	1.86	0.06	0.06	0.12	0.72	0.84	--	--	--	--	--	--	0.06
Power	1.70	.05	.05	.11	.67	.77	--	--	--	--	--	--	.05

[1] Animal-unit days of grazing for 1 mature brood cow or equivalent.

[2] Average of 50 pounds of seed per acre harvested 2 years in 5.

[3] One-fifth of establishment requirements plus maintenance requirements. Includes 120 percent of usual man labor requirements and 110 percent of usual power requirements. It was assumed that 20 percent additional labor above field time would be required to service equipment and move to, from, and between fields. Power requirements for this servicing and movement between fields were assumed to add 10 percent to that required for the field work itself.

APPENDIX TABLE 7.—SUDAN PASTURE: AVERAGE YIELD AND USUAL PRODUCTION REQUIREMENTS

	Average per acre
Normal Yield:	
Animal unit days[1]	98
Seed per acre, pounds	10
Value of seed and treatment per pound:	
Bought: 100 percent at $0.07 per pound	0.70

USUAL LABOR AND POWER PER ACRE

Item	Size of equipment	Acres per 10 hour day	Times over	Total hours Man	Total hours Tractor
Flatbreak	3-14 in.	13	0.33	0.25	0.25
One-way	9 ft.	32	.8	.25	.25
Hoeme	10 ft.	32	.8	.25	.25
Field-cult. or Hoeme	10 ft.	40	2.0	.50	.50
Harrow	3 sec.	40	1.0	.25	.25
Plant	2 row	20	1.0	.50	.50
Cultivate	2 row	20	1.0	.50	.50
Total direct requirements				2.50	2.50

DISTRIBUTION OF TOTAL HOURS OF LABOR AND POWER REQUIREMENTS PER ACRE[2]

	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Labor	3.0	0.30	0.30	0.40	0.50	1.20	--	--	--	--	--	--	0.30
Power	2.75	.25	.25	.40	.50	1.10	--	--	--	--	--	--	.25

Usual planting period, May—July

Usual grazing period, June 1—Sept 30

[1] Animal-unit days of grazing for one mature brood cow or equivalent.
[2] Includes 120 percent of usual man-labor requirements and 110 percent of usual power requirements for early Sudan. Requirements for late Sudan would be approximately 2 months later than shown. It was assumed that 20 percent additional labor above field time would be required to service equipment and to move to, from, and between fields. Power requirements for this servicing and movement between fields were assumed to add 10 percent to that required for the fieldwork itself.

Livestock Enterprises

Beef cattle is the chief livestock enterprise now on farms in southwestern Oklahoma. Also, beef cattle production appears to have more favorable opportunities for future expansion than production of other types of livestock. Dairy production is of importance near the larger cities, particularly Lawton and Chickasha, but possibilities for expansion appear to be limited. Some sheep, hog, and poultry enterprises are located in the area, but they are of little commercial importance.

Two types of beef cattle production are considered: (1) a cow-calf system, and (2) a feeder steer system.

Cow-Calf System

A flexible calving system is most common on farms in southwestern Oklahoma. Usually, half the calves are born between October 1 and December 31, and half between January 1 and March 31. With this calving program, about 50 percent of the calves are sold in July and August for slaughter and the rest in September and October as feeders.

The usual feeding practices have included wintering beef cattle on oat hay, cottonseed cake, and available wheat pasture. Native pasture and Sudan have been used for summer grazing and for fattening slaughter calves. The feed and grazing reported for present practices in Appendix Table 8 reflect the usual quantities of feed and grazing now provided per brood cow on crop farms surveyed in southwestern Oklahoma. The feed and grazing reported for proposed practices reflect the possible changes in quantity of feed and grazing per brood cow if all nonallotment cropland were used to provide hay and grazing for beef cattle on these same crop farms. The chief difference in the proposed practices comparison is the increased importance of grazing crops, small grain, Blue Panic and Sudan, relative to native pasture. In the summer pasture program, both Blue Panic and Sudan are recommended by forage specialists in order to assure a more stable pasture supply. On the average, wheat pasture has provided approximately 43 percent of the wintering requirements for beef cattle from November 15 to April 1, although the amount provided varies from year to year. Much of this pasture is provided as a supplement to wheat production. In the event of a significant reduction in wheat acreage, additional hay will be needed for wintering purposes.

Feeder Steer System

Although the cow-calf system is the most usual one, a buy-sell

feeder steer program may have a place on many farms in southwestern Oklahoma. The buy-sell feeder steer program is one in which steer calves weighing about 425 pounds are carried through for a year and marketed as feeder steers weighing about 780 pounds.

The feeder steer system allows more flexibility in numbers from year-to-year to fit available feed than does the cow-calf program (Appendix Table 9). A major disadvantage to the feeder steer system is the recurrent year-to-year need to purchase replacement calves for the feeder steers sold. A "purchase cost" based on the use of an order buyer to make contractual arrangements for purchase of calves is assumed. The possibility of variations in quality of calves (stability of supply) available from year-to-year has not been considered as a "cost." In the cow-calf system the control of quality is almost directly in the hands of the individual farmer through his choice of bulls and selection of replacement heifers. Also, a sizeable shift from cow-calf to feeder steer operations in the area would likely result in a more favorable relative price for farm produced calves. However, the feeder steer program appears preferable on crop farms with sufficient grazing for a cow herd of less than 20 brood cows.

The difference in feed requirements between the present and proposed practices reflects a change in relative emphasis from native pasture to seeded pasture crops.

APPENDIX TABLE 8.—COW-CALF: PRODUCTION REQUIREMENTS AND PRODUCTION PER BROOD COW WITH PRESENT AND PROPOSED PRACTICES[1]

Item	Unit	Present practices	Proposed practices
Feed:[2]			
Cottonseed cake	Pound	150	90
Oat hay	Ton	1.12	.88
Pasture:			
Native	Acre	6.9	3.2
Sudan	Acre	1.6	.9
Blue Panic	Acre	--	1.0
Small grain:			
Grazed out	Acre	--	1.1
Harvested	Acre	3.7	3.7
Salt and minerals	Dollar	1	1
Veterinary medicine, and spray	Dollar	2	2
Marketing costs:			
Calf	Dollar	2.75	2.75
Cull cow	Dollar	3.80	3.80
Taxes	Dollar	1.50	1.50
Calf crop (weaned basis)	Percent	90	90
Death loss, cows	Percent	3	3
Replacement rate	Percent	15	15
Man labor	Hour	17	17
Production for sale:			
Calf	Pound	412	412
Cull cow[3]	Pound	114	114

TOTAL LABOR REQUIREMENTS PER BROOD COW, BY MONTHS

Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
17	1.9	1.9	1.9	1.4	1.3	1.1	1.0	1.0	1.0	1.3	1.4	1.8

[1] Herd composition per brood cow: Heifer 1-2 years, 0.15, heifer weaning to one year, 0.15, to allow 15 percent of cows raised as replacements annually; herd bull, 0.04, annual bull death loss of 5 percent; 20 percent of bulls culled annually and sold at $140 each; 25 percent of bulls replaced annually, purchased at $300 each.

[2] Includes share of feed and grazing for replacement heifers and bull as well as cow and calf.

[3] Twelve percent of cows culled annually and sold at 950 pounds.

APPENDIX TABLE 9.—FEEDER STEER: PRODUCTION REQUIREMENTS AND PRODUCTION PER FEEDER STEER WITH PRESENT AND PROPOSED PRACTICES

Item	Unit	Present practices	Proposed practices
Feed:			
Cottonseed cake	Pound	125	75
Oat hay	Ton	.43	.36
Pasture:			
Native	Acre	3.3	1.4
Sudan	Acre	.8	.4
Blue Panic	Acre	–	.4
Small grain:			
Grazed out	Acre	–	.5
Harvested	Acre	1.6	1.6
Salt and minerals	Dollar	.80	.80
Veterinary medicine, and spray	Dollar	1.50	1.50
Marketing costs	Dollar	3.80	3.80
Taxes	Dollar	.75	.75
Hauling and commissions (purchase cost)	Dollar	4.25	4.25
Death loss	Percent	1	1
Man labor	Hour	11	11
Purchase weight	Pound	425	425
Production for sale:			
Feeder steer	Pound	772	772
Net pounds produced	Pound	347	347

TOTAL LABOR REQUIREMENTS PER FEEDER STEER, BY MONTHS

Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
11	1.2	1.2	1.2	0.8	0.6	0.6	0.6	0.8	0.9	0.9	1.1	1.1

II

Additional Tables

APPENDIX TABLE 10.—ESTIMATED PRICES RECEIVED FOR FARM PRODUCTS AND PAID FOR MATERIALS AND SERVICES USED IN PRODUCTION WITH TWO PRICE LEVELS, SOUTHWESTERN OKLAHOMA[1]

Item	Unit	Present price Dollars	Long-term price Dollars	Item	Unit	Present price Dollars	Long-term price Dollars
				Prices Received for Farm Products Sold			
Wheat	Bu.	1.70	1.60	Beef calves	Cwt.	19.00	19.00
Cotton, lint[2]	Lb.	.285	.24	Yearling feeders	Cwt.	18.50	18.50
Cottonseed	Lb.	.03	.033	Cull beef cows	Cwt.	12.25	12.25
Oats	Bu.	.65	.75	Cull milk cows	Cwt.	10.25	10.25
Blue Panic seed	Lb.	.50	.50				
				Prices Paid for Items Used in Production			
Seed:				Feeder steer calves	Cwt.	20.50	20.50
Wheat	Bu.	3.00	3.00	Contract work:			
Cotton, fuzzy	Lb.	.10	.10	Combining, small grain	Acre	3.00	3.25
Cotton, delinted	Lb.	.18	.18	Combining, Blue Panic	Acre	5.00	5.40
Oats	Bu.	1.25	1.25	Cotton snapping	Cwt.	2.00	2.40
Sudan	Lb.	.07	.07	Cotton stripping	Cwt.	1.00	1.25
Blue Panic	Lb.	.75	.75	Baling hay	Ton	6.00	6.25
				Hauling wheat	Bu.	.05	.05
Fertilizer:				Hauling oats	Bu.	.03	.03
Ammonium nitrate	Cwt.	4.50	4.50	Mowing machine rental	Acre	.25	.25
				Hay rake rental	Acre	.25	.25
Feed:				Cleaning and sacking			
Cottonseed cake	Ton	80.00	80.00	Blue Panic seed	Cwt.	2.00	2.00
Small grain hay	Ton	12.50	12.50	Cotton ginning, bagging & ties	Bale	14.50	14.50
				Hired labor	Hour	.75	.90

[1] Present price level assumes continuation of present (1958) allotment and price-support programs for wheat and cotton. Oklahoma State prices adjusted, when necessary, to southwestern Oklahoma conditions. The long-term projected prices are **not forecasts** of future prices but are based on rigid assumptions of population growth, national prosperity, and a trend toward world peace.

[2] Net price of lint per pound based on an average of 480 pounds of lint per 500-pound gross-weight bale. This is approximately 104 percent of the usual quoted price of lint.

APPENDIX TABLE 11.—ESTIMATED HOURS OF MAN LABOR REQUIRED, BY MONTHS, SPECIFIED FARMING SYSTEMS

Item	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Present System													
Crops	26	23	26	46	108	369	370	13	25	221	167	46	1,440
Livestock	66	64	66	67	61	59	55	54	52	54	58	64	720
Overhead	5	4	5	6	8	21	21	3	4	25	15	6	123
Total, all labor	97	91	97	119	177	449	446	70	81	300	240	116	2,283
Available family labor	220	220	240	260	280	340	340	260	280	300	240	220	3,200
Labor hired	–	–	–	–	–	109	106	–	–	–	–	–	215
System 1													
Crops	18	18	20	30	85	383	402	13	28	215	154	28	1,394
Livestock	74	71	74	66	61	61	60	65	64	60	70	70	796
Overhead	5	4	5	5	7	22	23	4	5	25	16	5	126
Total all labor	97	93	99	101	153	466	485	82	97	300	240	103	2,316
Available family labor	220	220	240	260	280	340	340	260	280	300	240	220	3,200
Labor hired	–	–	–	–	–	126	145	–	–	–	–	–	271
System 2													
Crops	23	19	22	42	77	347	378	13	22	216	155	41	1,355
Livestock	74	71	74	66	61	61	60	65	64	60	70	70	796
Overhead	5	5	5	5	7	20	22	4	4	24	15	6	122
Total, all labor	102	95	101	113	145	428	460	82	90	300	240	117	2,273
Available family labor	220	220	240	260	280	340	340	260	280	300	240	220	3,200
Labor hired	–	–	–	–	–	88	120	–	–	–	–	–	208
System 3													
Crops	25	25	35	46	143	372	373	13	28	194	140	34	1,428
Livestock	104	101	104	95	87	80	75	74	73	80	84	96	1,053
Overhead	6	6	7	7	12	23	22	4	5	26	16	7	141
Total all labor	135	132	146	148	242	475	470	91	106	300	240	137	2,622
Available family labor	220	220	240	260	280	340	340	260	280	300	240	220	3,200
Labor hired	–	–	–	–	–	135	130	–	–	–	–	–	265

(Continued)

(Continued)

APPENDIX TABLE 11.—ESTIMATED HOURS OF MAN LABOR REQUIRED, BY MONTHS, SPECIFIED FARMING SYSTEMS

Item	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
						System 4							
Crops	25	24	27	35	96	397	439	19	31	208	151	37	1,489
Livestock	74	71	74	66	61	61	60	65	64	60	70	70	796
Overhead	5	5	5	5	8	23	25	4	5	32	19	5	141
Total, all labor	104	100	106	106	165	481	524	88	100	300	240	112	2,426
Available family labor	220	220	240	260	280	340	340	260	280	300	240	220	3,200
Labor hired	–	–	–	–	–	141	184	–	–	–	–	–	325
						System 5							
Crops	35	35	61	88	282	289	157	–	14	64	25	35	1,085
Livestock	186	184	186	157	144	126	115	114	113	137	140	168	1,770
Overhead	11	11	13	13	21	21	14	5	6	10	8	10	143
Total, all labor	232	230	260	258	447	436	286	119	133	211	173	213	2,998
Available family labor	220	220	240	260	280	340	340	260	280	300	240	220	3,200
Labor hired	12	10	20	–	167	96	–	–	–	–	–	–	305

APPENDIX TABLE 12.—ESTIMATED HOURS OF TRACTOR POWER REQUIRED, BY MONTHS, SPECIFIED FARMING SYSTEMS

Month	Present system	Alternative systems				
		System 1	System 2	System 3	System 4	System 5
January	34	27	31	40	33	65
February	30	27	28	40	32	65
March	31	27	28	46	30	88
April	51	37	48	57	42	108
May	84	55	59	120	67	274
June	310	329	306	318	337	241
July	248	283	251	253	274	163
August	18	20	20	23	26	19
September	29	33	28	35	37	32
October	95	113	79	104	114	82
November	56	67	50	60	66	48
December	61	45	57	56	57	61
Total	1,047	1,063	985	1,152	1,115	1,246

APPENDIX TABLE 13.—ESTIMATED INVESTMENT ASSOCIATED WITH ALTERNATIVE FARMING SYSTEMS

Item	Present system	Alternative systems (improved production practices)				
		System 1	System 2	System 3	System 4	System 5
Land[1]	49,800	49,800	49,800	49,800	49,800	49,800
Terracing	--	225	225	225	225	225
Buildings: [2]						
Combination barn and granary	1,200	1,200	1,200	1,200	1,200	960
Corral system	102	102	102	102	102	132
Loafing shed, hay storage, etc.	120	120	120	120	120	240
Chicken house	150	150	150	150	150	150
Water system	180	180	180	180	180	240
Fencing, permanent	660	660	660	660	660	660
Fencing, electric	108	108	108	216	108	270
Total Land, Buildings, and Fencing	52,320	52,545	52,545	52,653	52,545	52,677
Farm power and machinery: [3]						
Tractors	3,225	3,225	3,225	3,225	3,225	3,225
Breaking plow	230	230	230	230	230	230
Hoeme	259	259	259	259	259	259
One-way	403	403	403	403	403	403
Section harrow	72	72	72	72	72	72
Grain drill	288	288	288	288	288	288
Row planter	164	164	164	164	164	164
Row cultivator	144	144	144	144	144	144
Cotton trailer	86	86	86	86	86	--
Pickup truck	880	880	880	880	880	880
Total Farm Power and Machinery	5,751	5,751	5,751	5,751	5,751	5,665
Livestock:						
Milk cows (2 years and older)	254	254	254	254	254	254
Beef cattle:						
Cows (2 years and older)	1,651	--	--	4,064	--	9,271
Heifers (1-2 years)	190	--	--	475	--	1,045
Heifer calves	225	--	--	375	--	900
Bull	210	--	--	420	--	630
Yearling feeders	--	3,132	3,132	--	3,132	--
Hens	40	40	40	40	40	40
Total Livestock	2,570	3,426	3,426	5,628	3,426	12,140
Total Investment	60,641	61,722	61,722	64,032	61,722	70,482

[1] Includes only s[illegible] value of land; value of additional terracing included in alternative systems.

APPENDIX TABLE 14.—ESTIMATED COST OF OPERATING TRACTORS, SOUTHWESTERN OKLAHOMA

2—PLOW TRACTOR—20-29 D.B.H.P.

Item	Unit	Quantity	Price	Cost
Operating costs (per 10 hour day)			Dollars	Dollars
Gasoline	Gal.	18	.20	3.60
Oil	Qt.	1	.25	.25
Grease	Lb.	1	.20	.20
Repairs	---	--	--	1.65
Total				5.70
Overhead costs (per year)				
List price (new)	---	--	2,375.00	--
Depreciation [1]	---	--	--	190.00
Interest on investment [2]		--	--	85.50
Total				275.50

3—PLOW TRACTOR—30-39 D.B.H.P.

Operating costs (per 10 hour day)				
Gasoline	Gal.	24	.20	4.80
Oil	Qt.	2	.25	.50
Grease	Lb.	1	.20	.20
Repairs	---	--	--	2.00
Total				7.50
Overhead costs (per year)				
List price (new)			3,000.00	--
Depreciation [1]				240.00
Interest on investment [2]				108.00
Total				348.00

[1] Straight-line depreciation, 10-year life, 20-percent salvage value.
[2] 6-percent interest on 60 percent of list price.

APPENDIX TABLE 15.—ESTIMATED ANNUAL COST OF OPERATING SPECIFIED ITEMS OF FARM MACHINERY, SOUTHWESTERN OKLAHOMA

Item	Size	List price	Net cost[1]	Estimated Life	Repairs	Overhead costs		Hours used	Costs per hour used	
						Depreciation[2]	Interest[3]		Repairs	Overhead
		Dollars	Dollars	Years	Dollars	Dollars	Dollars	Hours	Cents	Cents
Breaking plow	3-14 in.	400	340	15	25	21	14	90	28	37
Hoeme	10 ft.	450	385	18	35	21	16	238	15	16
One-way	9 ft.	700	595	15	25	40	24	185	14	35
Section harrow	3 sec.	125	105	20	10	5	4	86	12	10
Grain drill	16-8 in.	500	425	15	25	28	17	60	42	75
Row planter	2 row	285	245	18	12	14	10	46	26	52
Cultivator	2 row	250	215	15	17	14	9	80	21	29
Mowing machine[4]	7 ft.	350	300	12	10	25	12	150	7	25
Side delivery rake[4]	10 ft.	525	445	12	15	37	18	150	10	37
Cotton-trailer	1 bale	---	150	20	10	8	5	50	20	26

[1] List price minus salvage value.

[2] Straight-line depreciation, 15 percent salvage value.

[3] 6 percent interest on 57.5 percent of list price.

[4] From reports of farmers using mowers and rakes in connection with custom operations.

APPENDIX TABLE 16.—PRODUCTION AND DISPOSITION OF CROPS AND LIVESTOCK PRODUCTS, BY SYSTEMS OF FARMING

Product	Unit	Production	Seed or replacement	Fed	Home use		Sales	
					Quantity	Value	Quantity	Value
			Present System			Dollars		Dollars
Wheat	Bu.	2,310	66	34	---	---	2,210	3,757
Cotton, lint	Lb.	6,750	---	---	---	---	6,750	1,924
Cotton, seed	Lb.	11,250	540	560	---	---	10,150	305
Oats, grain	Bu.	714	23	97	---	---	594	386
Oats, hay	Ton	17	---	17	---	---	---	---
Native pasture	A.U.D.	4,070	---	4,070	---	---	---	---
Sudan pasture	A.U.D.	2,450	---	2,450	---	---	---	---
Small grain pasture (harvested)	A.U.D.	1,232	---	1,232	---	---	---	---
Beef cows	Lb.	1,482	---	---	---	---	1,482	182
Cull milk cow	Lb.	204	---	---	---	---	204	21
Cull beef bull	Dol.	28	---	---	---	---	---	28
Calves	Lb.	7,425	1,072	---	550	105	5,803	1,103
Milk	Cwt.	56	---	3	53	130	---	---
Poultry meat	Lb.	180	---	---	140	32	40	9
Eggs	Doz.	400	---	---	200	74	200	74
Total						341		7,789

CONTINUED

APPENDIX TABLE 16.—PRODUCTION AND DISPOSITION OF CROPS AND LIVESTOCK PRODUCTS, BY SYSTEMS OF FARMING—(Continued)

Product	Unit	Production	Seed or replacement	Fed	Home use		Sales	
					Quantity	Value	Quantity	Value
			System 1			Dollars		Dollars
Wheat	Bu.	2,184	66	34	---	---	2,084	3,543
Cotton, lint	Lb.	6,750	---	---	---	---	6,750	1,924
Cotton, seed	Lb.	11,250	540	560	---	---	10,150	305
Oats, grain	Bu.	3,150	63	97	---	---	2,990	1,944
Blue Panic seed	Lb.	180	---	---	---	---	180	90
Native pasture	A.U.D.	4,070	---	4,070	---	---	---	---
Sudan pasture	A.U.D.	882	---	882	---	---	---	---
Blue Panic pasture	A.U.D.	1,071	---	1,071	---	---	---	---
Small grain pasture (harvested)	A.U.D.	946	---	946	---	---	---	---
Cull milk cow	Lb.	204	---	---	---	---	204	21
Calves	Lb.	990	---	---	550	105	440	84
Yearling feeders	Lb.	20,844	---	---	---	---	20,844	3,856
Milk	Cwt.	56	---	3	53	130	---	---
Poultry meat	Lb.	180	---	---	140	32	40	9
Eggs	Doz.	400	---	---	200	74	200	74
Total						341		11,850
			System 2					
Wheat	Bu.	2,538	66	85	---	---	2,387	4,058
Cotton, lint	Lb.	6,750	---	---	---	---	6,750	1,924
Cotton, seed	Lb.	11,250	540	560	---	---	10,150	305
Blue Panic seed	Lb.	180	---	---	---	---	180	90
Native pasture	A.U.D.	4,070	---	4,070	---	---	---	---
Sudan pasture	A.U.D.	882	---	882	---	---	---	---
Blue Panic pasture	A.U.D.	1,071	---	1,071	---	---	---	---
Small grain pasture (harvested)	A.U.D.	946	---	946	---	---	---	---
Cull milk cow	Lb.	204	---	---	---	---	204	21
Calves	Lb.	990	---	---	550	105	440	84
Yearling feeders	Lb.	20,844	---	---	---	---	20,844	3,856
Milk	Cwt.	56	---	3	53	130	---	---
Poultry meat	Lb.	180	---	---	140	32	40	9
Eggs	Doz.	400	---	---	200	74	200	74

System								
Wheat	Bu.	2,208	66	85	---	---	2,057	3,497
Cotton, lint	Lb.	6,750	---	---	---	---	6,750	1,924
Cotton, seed	Lb.	11,250	540	560	---	---	10,150	305
Oat hay	Ton	30	---	30	---	---	---	---
Blue Panic seed	Lb.	660	---	---	---	---	660	330
Native pasture	A.U.D.	4,070	---	4,070	---	---	---	---
Sudan pasture	A.U.D.	3,136	---	3,136	---	---	---	---
Blue Panic pasture	A.U.D.	3,927	---	3,927	---	---	---	---
Small grain pasture (harvested)	A.U.D.	2,640	---	2,640	---	---	---	---
Small grain pasture (grazed out)	A.U.D.	3,648	---	3,648	---	---	---	---
Beef cows	Lb.	3,648	---	---	---	---	3,648	447
Cull milk cow	Lb.	204	---	---	---	---	204	21
Cull beef bull	Dol.	56	---	---	---	---	---	56
Calves	Lb.	16,830	2,640	---	550	105	13,640	2,592
Milk	Cwt.	56	---	3	53	130	---	---
Poultry meat	Lb.	180	---	---	140	32	40	9
Eggs	Doz.	400	---	---	200	74	200	74
Total						341		9,255
System 4								
Wheat	Bu.	3,200	96	85	---	---	3,019	4,830
Cotton, lint	Lb.	9,300	---	---	---	---	9,300	2,232
Cotton, seed	Lb.	15,500	740	560	---	---	14,200	469
Blue Panic seed	Lb.	180	---	---	---	---	180	90
Native pasture	A.U.D.	4,070	---	4,070	---	---	---	---
Sudan pasture	A.U.D.	882	---	882	---	---	---	---
Blue Panic pasture	A.U.D.	1,071	---	1,071	---	---	---	---
Small grain pasture (harvested)	A.U.D.	946	---	946	---	---	---	---
Cull milk cow	Lb.	204	---	---	---	---	204	21
Calves	Lb.	990	---	---	550	105	440	84
Yearling feeders	Lb.	20,844	---	---	---	---	20,844	3,856
Milk	Cwt.	56	---	3	53	130	---	---
Poultry meat	Lb.	180	---	---	140	32	40	9
Eggs	Doz.	400	---	---	200	74	200	74
Total						341		11,665

APPENDIX TABLE 16.—PRODUCTION AND DISPOSITION OF CROPS AND LIVESTOCK PRODUCTS, BY SYSTEMS OF FARMING—(Continued)

Product	Unit	Production	Seed or replacement	Fed	Home use		Sales	
					Quantity	Value	Quantity	Value
			System 5			Dollars		Dollars
Oat hay	Ton	124.5	---	124.5	---	---	---	---
Blue Panic seed	Lb.	2,000	---	---	---	---	2,000	1,000
Native pasture	A.U.D.	4,070	---	4,070	---	---	---	---
Sudan pasture	A.U.D.	9,310	---	9,310	---	---	---	---
Blue Panic pasture	A.U.D.	11,900	---	11,900	---	---	---	---
Small grain pasture (grazed out)	A.U.D.	7,872	---	7,872	---	---	---	---
Beef cows	Lb.	8,322	---	---	---	---	8,322	1,019
Cull milk cow	Lb.	204	---	---	---	---	204	21
Cull beef bull	Dol.	84	---	---	---	---	---	84
Calves	Lb.	37,125	6,022	---	550	105	30,553	5,805
Milk	Cwt.	56	---	3	53	130	---	---
Poultry meat	Lb.	180	---	---	140	32	40	9
Eggs	Doz.	400	---	---	200	74	200	74
						---		---
Total						341		8,012

APPENDIX TABLE 17.—FEED NEEDS ASSOCIATED WITH ALTERNATIVE SYSTEMS OF FARMING

Kind of Livestock	Grain (pounds)	Protein supplement (pounds)	Hay (tons)	Other [1] (pounds)
Present System				
Beef cattle	----	1,950	14.8	----
Milk cows	2,400	500	2.2	----
Poultry	2,700	----	---	1,300
Total needed	5,100	2,450	17.0	1,300
Available from farm production	5,100	----	17.0	----
Purchased	----	2,450	---	1,300
System 1				
Yearling feeders	----	3,375	11.6	----
Poultry	2,700	----	---	1,300
Milk cows	2,400	500	2.2	----
Total needed	5,100	3,875	13.8	1,300
Available from farm production	5,100	----	---	----
Purchased	----	3,875	13.8	1,300
System 2				
Yearling feeders	----	3,375	11.6	----
Milk cows	2,400	500	2.2	----
Poultry	2,700	----	---	1,300
Total needed	5,100	3,875	13.8	1,300
Available from farm production	5,100	----	---	----
Purchased	----	3,875	13.8	1,300
System 3				
Beef cattle	----	2,880	27.8	----
Milk cows	2,400	500	2.2	----
Poultry	2,700	----	---	1,300
Total needed	5,100	3,380	30.0	1,300
Available from farm production	5,100	----	30.0	----
Purchased	----	3,380	---	1,300

CONTINUED

APPENDIX TABLE 17.—FEED NEEDS ASSOCIATED WITH ALTERNATIVE SYSTEMS OF FARMING (Continued)

System 4				
Yearling feeders	----	3,375	11.6	----
Milk cows	2,400	500	2.2	----
Poultry	2,700	----	---	1,300
Total needed	5,100	3,875	13.8	1,300
Available from farm production	5,100	----	---	----
Purchased	----	3,380	---	1,300
System 5				
Beef cattle	----	6,570	122.3	----
Milk cows	2,400	500	2.2	----
Poultry	2,700	----	---	1,300
Total needed	5,100	7,070	124.5	1,300
Available from farm production	----	----	124.5	----
Purchased	5,100	7,070	---	1,300

[1] Poultry growing and laying mash. Milk fed not included in this table.

APPENDIX 18.—OVERHEAD COSTS ASSOCIATED WITH ALTERNATIVE FARMING SYSTEMS

Item	Present system & practices	Alternative systems (improved practices)				
		System 1	System 2	System 3	System 4	System 5
	Dollars					
Building repairs [1]	44	44	44	44	44	44
Fence upkeep on repairs [1]	124	124	124	160	124	178
Taxes	395	399	399	429	399	495
Insurance on farm buildings	20	20	20	20	20	20
Interest on operating capital	63	95	100	75	114	80
Electricity and telephone	48	48	48	48	48	48
Total	694	730	735	776	749	865
Depreciation:						
Buildings	121	121	121	121	121	121
Tractors	430	430	430	430	430	430
Farm machinery	151	151	151	151	151	143
Pickup truck	200	200	200	200	200	200
Total	902	902	902	902	902	894

[1] Excluding labor.