Effect of Changes in Product Price Relationships On Farm Organization and Income CLAY Soil Farms - Southwestern Oklahoma

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The overall purposes of this project are: (1) to provide guides to farmers choosing among alternative production opportunities, especially as those opportunities are affected by changes in prices and technology, and (2) to provide guides to farmers and other persons engaged in developing and administering public agricultural programs.

This is the seventh in a series of publications which have been developed from the Regional Project and Oklahoma Agricultural Experiment Station Project 1040. The other publications are as follows:

1. Goodwin, J. W., Plaxico, J. S., and Lagrone, W. F., *Resource Requirements, Costs, and Expected Returns; Alternative Crop and Livestock Enterprises; CLAY Soils of the Rolling Plains of Southwestern Oklahoma,* Okla. Agr. Expt. Sta. Processed Ser. P-357, September 1960.
2. Connor, L. J., Lagrone, W. F., and Plaxico, J. S., *Resource Requirements, Costs, and Expected Returns; Alternative Crop and Livestock Enterprises; LOAM Soils of the Rolling Plains of Southwestern Oklahoma,* Okla. Agr. Expt. Sta. Processed Ser. P-368, February 1961.
3. Strickland, P. L., Jr., Lagrone, W. F., and Plaxico, J. S., *Resource Requirements, Costs, and Expected Returns, Alternative Crop and Livestock Enterprises; SANDY Soils of the Rolling*

Plains of Southwestern Oklahoma, Okla. Agr. Expt. Sta. Processed Ser. P-369, February 1961.

4. Strickland, P. L., Jr., Plaxico, J. S., and Lagrone, W. F., *Minimum Land Requirements and Adjustments for Specified Income Levels, Southwestern Oklahoma,* Okla. Agr. Expt. Sta. Bul. B-608, May 1963.

5. White, J. H., Plaxico, J. S., and Lagrone, W. F., *The Influence of Selected Restraints on Normative Supply Relationships for Dryland Crop Farms on LOAM Soils, Southwestern Oklahoma,* Okla. Agr. Expt. Sta. Tech. Bul. T-101, May 1963.

6. Goodwin, J. W., Plaxico, J. S., and Lagrone, W. F., *Aggregation of Normative Microsupply Relationships for Dryland Crop Farms in the Rolling Plains of Oklahoma and Texas,* Okla. Agr. Expt. Sta. Tech. Bul. T-103, August 1963.

Effect of Changes in Product Price Relationships on Farm Organization and Income—CLAY Soil Farms, Southwestern Oklahoma

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This bulletin reports part of the results of a study made to estimate the optimum (most profitable) combination of farm enterprises on representative farms of various soil types and croplands in southwestern Oklahoma. The most profitable combinations were influenced by alternative prices of cotton, wheat, and beef cattle.

Adjusting to changing conditions, both within and without agriculture, is one of the major problems facing farmers of our time. American agriculture has changed, in a relatively short time, from problems associated with providing adequate food and fiber for an expanding population to problems resulting from aggregate production of some commodities greater than demand at current prices.

Objective

The general objective of the overall study (S-42) is to provide information for farmers, farm policymakers, and the general public which will be useful in appraising alternative means of solving current farm adjustment problems. The specific objective of this report is to provide information useful in appraising the effect of changes in price relationships on organization, production, and income on farms with clay soils in southwestern Oklahoma.

The analysis is based on consideration of one farm situation which is assumed to be representative of all clay soil farms. Thus, the data

The research reported herein was done under Station Project 1040.

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may not fit exactly a specific individual farm. However, adaptations or adjustments can be easily made for other clay farm situations.

Geographic Area

This report applies to the clay soils of 11 counties in the Rolling Plains area of southwestern Oklahoma (Figure 1). According to the 1959 United States Census of Agriculture, the area contained approximately 16 percent of all land in farms in Oklahoma, 22 percent of the total cropland harvested, 70 percent of the cotton, 20 percent of the wheat, and about 13 percent of the cattle and calves on farms.

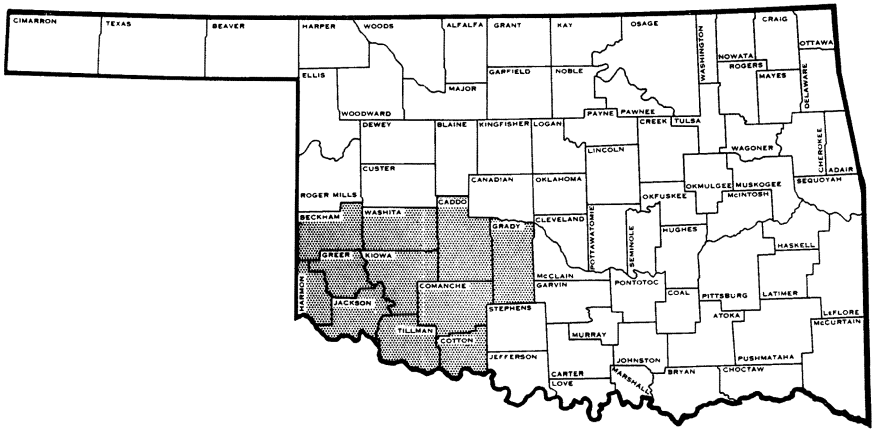

Figure 1. Shaded area covers counties included in this study.

The agriculture of the area is characterized by farms which primarily produce field crops—cotton, wheat, and other small grains—with supplementary livestock enterprises, and by ranching operations interspersed throughout the area. Cash grain and cotton farms account for about one-half of all the farms and total land in farms, and about two-thirds of the cropland harvested. Livestock farms account for about 11 percent of all farms and occupy about 18 percent of the total land. Cattle and calves were reported on about 80 percent of all farms in the area in 1959.

The Rolling Plains area is composed of three broad groups of soil resources: (1) clay soils, (2) loam soils, and (3) sandy soils. Each of these three soil resource groups occur in relatively homogeneous blocks over extensive areas. Each soil resource group has been divided into cropland productivity classes. The productivity ratings are based on soil

surveys conducted by the Soil Conservation Service of the U. S. Department of Agriculture.

Method of Analysis

The procedure used in this analysis involved (1) selecting a representative farm resource situation, (2) assembling data pertaining to price and assumed price relationships, (3) constructing yield and input budgets for adapted crops and classes of livestock, (4) determining optimum farm organizations which would be most profitable under the various alternative situations assumed. Linear programming technique was used to determine optimum farm organizations.

The procedure involved analysis of the influence of various prices of cotton, wheat, and beef cattle, and costs of capital on the optimum combination of enterprises for a representative clay farm in southwestern Oklahoma. A total of 30 optimum combinations of enterprises were developed, based on five cotton prices, three wheat and beef cattle prices, and two different charges for the use of capital.

A Representative Clay Farm

Table 1 shows the major resource assumptions for a representative clay farm. The average size of a clay farm now in the area is smaller than the 1,280 acres of total land and 1,000 acres of cropland. However, farmers operating 1,000 acres or more now control approximately one-half of the area's clay cropland. Also, preliminary programming of various sizes of clay farms indicates that very little change occurs on farms having between 250 and 1,000 acres of cropland.

Clay soil farms account for about 32 percent of all dry cropland in the area. Clay soils as defined in this study have fine to medium-textured topsoils and are very slowly permeable. Because of the compact clay subsoil, most clay soils are less productive than other soils within similar surface depth, slope, and erosion conditions. Clay cropland soils have been divided into four productivity classes—b, c, d, and e on the basis of topsoil depth, slope, and erosion condition (Table 1). The corresponding capability classes would be Classes II, III, IV, and VI.

Enterprise Alternatives

Alternative crop enterprises and yield levels assumed for the various classes of clay cropland are shown in Table 2. Wheat and cotton are the two major crop alternatives for clay soil farms in the area. On an area-wide basis, most of the other feasible crop alternatives are limited to

Table 1.—Resource Assumptions for the Representative 1280-Acre CLAY Farm.

Resource	Unit	Quantity
Total land	Acre	1,280
Cropland:		
Class b	"	360
Class c	"	368
Class d	"	160
Class e	"	112
Total cropland	"	1,000
Native pasture	"	235
Farmstead, etc.	"	45
Operator labor	Hour	
Jan.-Apr.	"	538
May-July	"	506
Aug.-Sept.	"	352
Oct.-Dec.	"	462
Total	"	1,858
Hired labor	"	[1]
Capital	Dollar	[2]
Technology		[3]

[1] Hired labor is available at a cost of $1.00 per hour.

[2] Capital is restricted to an amount that can be used in combination with other resources such that returns are at least 6 or 18 percent (whichever is specified) for each unit of capital used.

[3] Best presently available.

crops used by the cattle enterprises. These include oats for grain or hay, grazed out small grain, sudan grazing, and blue panic-sudan grazing. Wheat for grain is restricted to b, c, and d cropland classes and may be produced on a continuous basis or in rotation with fallow or cotton and fallow. Cotton production is confined to b and c productivity groups and may be produced under different levels of mechanization as well as in rotation with fallow or wheat and fallow. No irrigated crops or pastures are included.

Feasible livestock enterprises for the clay situations include beef cow-calf operations and the production of stocker cattle. Alternative systems for cow-calf beef production include spring or fall calving, creep and non-creep fed calves with various levels of winter rations. Alternative systems of stocker cattle production include fall buying, spring and summer selling of yearling feeder cattle and different levels of pasture and winter rations.

Table 2.—Crop and Pasture Yields, by Soil Productivity, Groups, CLAY Soils.

Crop	Unit	Yield by Soil Productivity Group			
		b	c	d	e
Wheat (continuous)	Bu.	14	12	10	--
After row crop (6 mo. fallow)	"	17	14	11	--
After 12 mo. fallow	"	19	16	12	--
Cotton	Lb. lint	175	125	--	--
Oats (continuous)	Bu.	28	20	15	--
Small grain hay	Ton	1.6	1.5	1.4	--
Grazing[1]					
Sudan	AUM	3.0	2.8	2.6	1.9
Grazed out small grain	AUM	3.1	2.9	2.8	1.9
Harvested small grain	AUM	.4	.35	.3	
Blue Panic	AUM	3.4	3.2	3.0	2.1

[1] Grazing yields are basically expected values since moisture is the limiting factor in forage production. The monthly distribution of grazing is not specified because of seasonal uncertainties. Permanent pasture grazing yield is 1 AUM per acre of range. The acreage of range land and cropland for livestock budgets can be calculated from this table.

Source: John W. Goodwin, et. al., *Resource Requirements, Costs, and Expected Returns; Alternative Crop and Livestock Enterprises, CLAY Soils of the Rolling Plains of Southwestern Oklahoma,* Okla. Agr. Expt. Sta. Processed Ser. P-357, September 1960.

Detailed budget information on all included crop and livestock enterprises with descriptions of classes of cropland, cropland and range productivity levels may be obtained from an earlier publication. (See Publication No. 1 listed under Acknowledgment on page 3 this bulletin.) Production levels assume advanced farm technology (the best presently available). Estimates of yield levels and enterprise inputs were based on results obtained from agricultural experiment station research, survey data, and estimates by agricultural scientists.

Cotton and wheat acreages were not assumed to be limited by acreage allotments or production controls.

Product Prices and Costs

Assumed prices received for products are shown in Table 3. A detailed listing of assumed prices paid by farmers is presented in Appendix Table 1. The level of prices received and of cost items is based on prior analyses but they are not predictions or forecasts of future prices. The prices of major products were varied to determine their effect on the farm organization. Cotton prices are varied ±20 and ±40 percent from the assumed level of 22 cents per pound of lint cotton. Therefore,

Table 3.—Assumed Prices of Farm Products.

Item	Unit	Base Price	Variation in Base Price Considered
		Dollars	*Percent*
Cotton lint	Lb.	.22	±20, ±40
Cotton seed	Ton	50.00	none
Wheat	Bu.	1.25	±30
Beef cattle			±30
Stocker and feeder steers*			
Good, 716# May	Cwt.	22.50	
Good, 760# July	"	21.00	
Good, 800# Aug.	"	20.75	
Stocker steer calves			
Good-choice, 485# Sept.	"	23.00	
Stocker and slaughter heifer calves			
Good-choice, 460# Sept.	"	21.00	
Cull cows, 987#	"	13.50	

*Assumes comparable prices if stocker heifers used.

cotton prices range from 13.20 cents to 30.80 cents per pound of lint cotton. Wheat and beef cattle prices are varied ±30 percent of their base price levels. For purposes of the study, the base price of wheat is $1.25 per bushel with a range in price of $0.88 to $1.62 per bushel. Although beef cattle prices are varied by the same magnitude as wheat, the base prices assumed depend upon the class of cattle and the seasonal distribution of prices. All cost items, except the charge for capital are assumed to remain at a constant level.

Effect of Price Changes on Farm Organization and Income

The linear programming model used to determine the optimum organizations requires the specification of land resources, fixed labor supply, and cost and income for alternative crop and livestock enterprises. In addition, capital requirements are estimated in order that the effect of different charges for capital use may be evaluated. The most profitable combination of enterprises (providing maximum net returns to the fixed land resources, 1,280 acres, and to the farm operator's labor, 1,858 hours) is obtained by examining various possible combinations.

In comparing the results of the analysis, the basic assumption should be understood, namely, that the time period for adjustment is of sufficient length that no cost is associated with adjusting from one optimum farm organization to another. In a time period shorter than that assumed (next year, for example) certain costs may be associated with large adjustments in organization. Each organization is one which maximizes returns to the farm operator's land and labor under the specified prices and costs. Other problems such as production control, differences in tenure, managerial ability, part-time work, and age and health of farm operators are not considered in this report.

Optimum Organizations with Six Percent Capital

At the base price for wheat and beef cattle, cotton is not included in the organization at prices of 22 cents per pound of lint, or below. Wheat—the major crop—is produced on about 67 percent of the total cropland (Table 4). Other cropland including about 19 percent in cultivated pasture and almost 14 percent in hay is devoted to forage production for buy-sell beef stocker enterprises. At this beef cattle price and capital cost, the utilization of native pasture through stocker cattle is more profitable than a beef cow-calf enterprise, see Appendix Table 2.

At 26.4 cents per pound, and base prices for other products, cotton becomes a major enterprise occupying 46 percent of the cropland while wheat and fallow each used about 11 percent of the cropland. Little change occurs in total cropland devoted to the production of hay and pasture; however, significant changes occur in the type of pastures. Summer grazing crops replace much of the "grazed out" small grain pasture. As cotton becomes more profitable than wheat, the amount of small-grain grazing decreases, and the beef stocker enterprise utilizes considerably more sudan or other summer grazing.

With cotton prices at 30.80 cents per pound and base prices for other products, cotton is grown on 534 acres. Wheat is produced only in rotation with cotton and the stocker cattle enterprise decreases in importance. As cotton production increases, the use of the various cropland productivity classes changes. The most productive cropland (class b) changes from all wheat to the production of cotton and wheat in a cotton-fallow-wheat rotation (C-C-C-C-F-W). The use of class c cropland undergoes about the same change except that roughly 12 percent remains in small-grain hay. More than half of the class d cropland is planted to small-grain hay while the remainder of class d and all of class e land remains in grazing crops. Specific uses of the cropland by productivity classes is shown in Appendix Table 3.

Table 4.—Optimum Organizations: Varying Product Prices and a Charge of Six Percent on Nonland Capital.

Enterprise	Unit	Cotton Prices (cents per pound) 13.2	17.6	22.0	26.4	30.8
Wheat and cattle at base prices						
Cotton	Acre	---	---	---	456	534
Wheat	"	668	668	668	113	61
Hay	"	138	138	138	137	123
Pasture	"	194	194	194	181	149
Fallow	"	---	---	---	113	133
Cotton produced	Cwt.	---	---	---	688	813
Wheat produced	Bu.	8,732	8,732	8,732	1,772	858
Beef stockers	Number	297	297	297	225	190
Operator labor	Hour	1,514	1,514	1,514	1,696	1,696
Hired labor	"	1,139	1,139	1,139	1,094	1,171
Nonland capital	Dollar	59,040	59,040	59,040	52,093	47,784
Net returns*	"	11,307	11,307	11,307	13,183	16,700
Wheat and cattle prices 30% below base						
Cotton	Acre	---	240	535	582	582
Wheat	"	760	428	61	---	---
Hay	"	54	29	4	---	---
Pasture	"	70	38	5	---	---
Fallow	"	---	60	133	146	146
Idle	"	116	205	262	272	272
Cotton produced	Cwt.	---	418	813	872	872
Wheat produced	Bu.	5,778	5,437	858	---	---
Beef cows	Number	11	14	17	17	17
Beef stockers	"	175	94	13	---	---
Operator labor	Hour	1,203	1,351	1,564	1,617	1,617
Hired labor	"	774	599	531	580	580
Nonland capital	Dollar	40,883	30,059	20,402	19,115	19,115
Net returns*	"	3,467	3,826	6,721	10,483	14,320
Wheat and cattle prices 30% above base						
Cotton	Acre	---	---	---	---	240
Wheat	"	668	668	668	668	376
Hay	"	138	138	138	138	138
Pasture	"	194	194	194	194	186
Fallow	"	---	---	---	---	60
Cotton produced	Cwt.	---	---	---	---	418
Wheat produced	Bu.	8,732	8,732	8,732	8,732	4,813
Beef stockers	Number	297	297	297	297	257
Operator labor	Hour	1,514	1,514	1,514	1,514	1,683
Hired labor	"	1,139	1,139	1,139	1,139	1,025
Nonland capital	Dollar	59,040	59,040	59,040	59,040	54,895
Net returns*	"	19,812	19,812	19,812	19,812	21,321

*Returns to land, operator labor, risk and management (includes returns to unallocated overhead costs).

At the base prices for wheat and livestock, there is remarkable stability in both operator and hired hourly labor requirements even though the major cash crop changes from wheat to cotton at high cotton prices. Peak labor requirements occur during May through July and October through December (Appendix Table 2). Labor associated with custom combining of wheat and custom stripping of cotton is not reflected in the hours of labor shown in Table 4.

The amount of nonland capital is greatest at the lower cotton prices because of the relatively greater importance of the stocker cattle enterprise.

At 26.4 cents per pound of cotton, the difference in net returns between the wheat-cattle organization and the cotton-cattle-wheat organization is $1,876. The price of cotton could drop to 23.7 cents per pound before the returns from the organization including cotton would be less than the returns from the wheat-cattle organization. Conversely, a wheat price of $1.46 per bushel would result in equal returns between the two organizations with cotton at 26.4 cents per pound. At a cotton price of 30.8 cents, net returns with cotton are about $5,400 more than the organization with no cotton. A wheat price of $1.87 per bushel would be required to equalize returns. However, the increase in 78 acres of cotton between the 26.4 and 30.8 cent price level results in a net increase of only $490 in net returns compared with returns if the organization at the 26.4 cent level were maintained but 30.8 cents was received for the smaller amount of cotton grown. Also, the additional 78 acres of cotton would not be produced at a cotton price of less than 30.2 cents per pound lint for cotton. Thus, the organization with 456 acres of cotton is near the optimum for any cotton price between 23.7 and 30.2 price per pound of lint cotton and base prices for wheat and cattle.

Effect of Varying Wheat and Cattle Prices

When the prices of wheat and beef cattle are 30 percent below their base levels, cotton becomes profitable at lower prices. However, at a cotton price of 13.2 cents the organization does not include any cotton. This commodity price relationship results in an organization of 760 acres of wheat and beef cattle enterprises including both beef stockers and beef cows. All of the more productive cropland, classes b and c, and 20 percent of the class d land is devoted to wheat. The remainder of class d land, except for four idle acres, is devoted to hay and pasture crops. All of the 112 acres of class e land is left idle. With prices of wheat and cattle 30 percent below base and cotton 17.6 cents, 240 acres of

cotton are produced on class b cropland in a cotton-fallow-wheat rotation. All class c cropland is in wheat. All class e land plus 93 acres of class d land would be idle.

At a cotton price of 26.4 cents or above, cotton is the only crop and all class d and e land is idle.

At low prices for wheat and beef cattle, requirements for hired labor are reduced significantly. Except at the lowest cotton price, cotton now has first call on all operator labor; wheat and beef cattle are not sufficiently profitable to pay for very much hired labor during peak periods. This explains the increasing acreage of idle land and low beef cattle numbers.

Again, the amount of nonland capital is greatest at lower cotton prices because of the greater importance of the beef cattle enterprises. At high cotton prices, only a small cow-calf enterprise remains to utilize native range.

All net returns are sharply reduced with low prices for wheat and beef cattle. Cotton would come into the organization at a price as low as 16.7 cents per pound, but an all wheat-cattle organization would be maintained at a cotton price of 17.6 cents per pound if the price of wheat were as high as 92 cents per bushel.

When the prices of wheat and beef cattle are 30 percent above their base prices, cotton becomes much less profitable. At a wheat price of $1.62 per bushel and a cotton price of 30.8 cents, 240 acres of cotton are produced on class b land in a cotton-fallow-wheat rotation and the remaining cropland is used for wheat, hay, and pasture. A cotton price of at least 27.2 cents per pound is necessary to equalize returns between a no cotton system and the system with 240 acres of cotton. Also, a wheat price of $1.79 per bushel would result in no cotton in the organization. The optimum organization with wheat and beef prices 30 percent above base and at cotton prices below 27.2 cents is the same as the organization with base prices for wheat and beef cattle and cotton prices below 23.7 cents per pound. With the higher prices for wheat and beef cattle, net returns are much greater than for any of the other comparisons.

Optimum Organizations with 18 Percent Capital

At a cost of 18 percent for nonland capital, investment in beef cattle, machinery, and other enterprise costs must return 18 cents for each dollar used. At base prices for wheat and beef cattle, size of beef cattle enterprises are reduced at all cotton price levels compared with six percent capital (Table 5). Cotton is included in the optimal organization at

Table 5.—Optimum Organizations: Varying Product Prices and a Charge of Eighteen Percent on Nonland Capital.

Enterprise	Unit	Cotton Prices (cents per pound) 13.2	17.6	22.0	26.4	30.8
Wheat and cattle at base prices						
Cotton	Acre	---	---	240	534	582
Wheat	"	763	763	510	194	142
Hay	"	55	55	34	12	8
Pasture	"	70	70	44	15	10
Fallow	"	---	---	60	133	146
Idle	"	112	112	112	112	112
Cotton produced	Cwt.	---	---	418	813	872
Wheat produced	Bu.	9,808	9,808	6,260	2,193	1,417
Beef cows	Number	11	11	13	16	17
Beef stockers	"	175	175	109	37	25
Operator labor	Hour	1,203	1,203	1,366	1,589	1,643
Hired labor	"	781	781	724	732	794
Nonland capital	Dollar	41,055	41,055	33,506	25,981	25,039
Net returns*	"	10,427	10,427	10,236	12,204	15,750
Wheat and cattle prices 30% below base						
Cotton	Acre	18	240	534	582	582
Wheat	"	338	60	61	---	---
Fallow	"	4	60	133	146	146
Idle	"	640	640	272	272	272
Cotton produced	Cwt.	30	418	813	813	872
Wheat produced	Bushel	4,743	1,020	858	---	---
Beef cows	Number	17	17	17	17	17
Operator labor	Hour	1,095	1,269	1,558	1,617	1,617
Hired labor	"	21	2	511	580	580
Nonland capital	Dollar	8,750	10,389	18,425	19,103	19,103
Net returns*	"	1,956	2,988	6,614	10,483	14,319
Wheat and cattle prices 30% above base						
Cotton	Acre	---	---	---	240	439
Wheat	"	828	828	828	522	270
Hay	"	60	60	60	66	70
Pasture	"	112	112	112	112	112
Fallow	"	---	---	---	60	109
Cotton produced	Cwt.	---	---	---	418	666
Wheat produced	Bushel	10,457	10,457	10,457	6,373	3,468
Beef stockers	Number	213	213	213	180	156
Operator labor	Hour	1,203	1,203	1,203	1,463	1,650
Hired labor	"	1,004	1,004	1,004	888	854
Nonland capital	Dollar	45,553	45,553	45,553	42,561	40,692
Net returns*	"	18,364	18,364	18,364	18,445	19,955

*Returns to land, operator labor, risk and management (includes returns to unallocated overhead costs).

a price of 22 cents compared to 26.4 cents with six percent capital. A cotton price of 30.8 cents results in the maximum cotton acreage.

With the price of wheat and beef cattle 30 percent below their base prices, a few acres of cotton are included in the organization of enterprises at 13.2 cents. At 13.2 and 17.6 cotton prices, only class b cropland is farmed and 640 acres are left idle. At higher cotton prices, the organizations at the two capital cost levels are the same.

When wheat and beef cattle prices are 30 percent above base prices, more wheat is produced at cotton prices of 22 cents or less and more cotton is produced at prices of 26.4 and 30.8 cents per pound than at a six-percent capital cost.

Except for price levels at which organizations are the same, labor requirements with an 18 percent capital cost are consistently lower than with a six percent capital cost because of smaller beef cattle enterprises (Appendix Table 4). For the same reason, nonland capital required is also lower. Net returns are lower, although the difference is less than 10 percent, except at the two lower cotton prices and the lowest wheat and beef cattle prices. At base prices for wheat and beef cattle, returns are approximately $1,000 less; and, at 30 percent above base prices for wheat and beef cattle, approximately $1,400 less than comparable returns with six percent capital. Also, nonland capital requirements are from $18,000 to $26,000 less at base prices for wheat and beef cattle and about $14,000 less at 30 percent above base prices for wheat and beef cattle.

Summary

This report is designed to provide information useful in appraising the effect of changes in price relationships on organization, production, and income on farms with clay soils in southwestern Oklahoma. A total of 30 optimum (most profitable) combinations of enterprises were developed, based on five prices of cotton, three prices for wheat and beef cattle and two different charges for the use of nonland capital.

Cotton price has a decided influence on the optimum combination of enterprises and net returns. In addition to high cotton prices, large cotton acreages are more profitable when wheat and beef cattle prices are low and when 18 percent interest is charged on nonland capital requirements. Largest wheat acreages occur with $1.62 per bushel wheat, cotton prices of 22 cents per pound or below, and an 18 percent capital charge. Beef cattle production is most important with base or higher wheat and beef cattle prices, low cotton prices, and a six percent charge for nonland

capital. At low prices for beef cattle much of the less productive cropland is left idle. With low prices for all products and an 18 percent capital charge, only 360 acres of the most productive cropland are used and 640 acres remain idle. Labor requirements are greatest in organizations containing a combination of cash crops and hay and pasture crops for large beef cattle enterprises. Net returns range from about $2,000 at low prices for all products and an 18 percent capital charge to a high of more than $21,000 with high prices for all products and a six percent interest charge.

With a six percent capital charge and base prices for wheat and beef cattle, an organization with 456 acres of cotton is optimum between a price range of 23.7 and 30.2 cents per pound. With prices for wheat and beef cattle 30 percent above their base price, a cotton price of approximately 27.2 cents per pound lint is necessary for cotton to be included in the optimum organization.

The results presented are "normative," estimates of what it would pay on the representative farm rather than a prediction of what farmers would do. They reflect the optimum organizations if the farm is operated in the efficient manner assumed, if the farmers have perfect knowledge of prices and costs, and are not limited by acreage allotments or production controls. The study is not intended to predict the actual actions of farmers, nor the actual adjustments farmers might make to the assumed conditions.

Appendix Table 1. Assumed Prices Paid by Farmers for Specified Items.

Item	Unit	Assumed Price
Seed		
Sudan grass, sweet	Cwt.	6.00
Seed oats	Bu.	1.10
Cotton seed	"	2.50
Seed wheat	"	2.25
Blue Panic grass	Lb.	.75
Feeds		
Alfalfa hay	Ton	25.00
Cottonseed cake	"	76.00
Custom Rates		
Combining wheat	Acre	3.00
Cotton stripping	Cwt. seed cotton	.75
Hay baling	Bale	.16
Cotton insecticide	Acre	2.00
Cotton desiccant	"	2.00
Cotton hoeing	"	2.50
Cotton hauling	Cwt. seed cotton	.25
Cotton ginning and wrapping	Cwt. seed cotton	.85
Fuel and Lubricants		
LP-gas	Gal.	.09
Gasoline	"	.20
Diesel oil	"	.16
Motor oil	"	1.00
Grease	Lb.	.20
Hired Labor	Hour	1.00
Stocker Steer Calves*		
Good-Choice 450# September	Cwt.	23.00
Good-Choice 450# October	"	22.50

*Assumes comparable prices if stocker heifer calves used.

Appendix Table 2.—Optimum Organizations: Type of Beef Cattle and Labor Requirements with a Charge of Six Percent on Nonland Capital.

Item	Unit	Cotton Prices (cents per pound) 13.2	17.6	22.0	26.4	30.8
Wheat and cattle at base prices						
Beef stockers						
Wheat grazed[1]	Head	173	173	173	50	33
Sudan grazed[2]	"	124	124	124	175	140
Native grass fed[3]	"	---	---	---	---	17
Operator labor						
Jan.-Apr.	Hour	399	399	399	554	554
May-July	"	506	506	506	506	506
Aug.-Sept.	"	147	147	147	174	174
Oct.-Dec.	"	462	462	462	462	462
Hired labor						
Jan.-Apr.	"	---	---	---	214	234
May-July	"	983	983	983	880	937
Oct.-Dec.	"	156	156	156	---	---
Wheat and cattle prices 30% below base						
Beef stockers						
Wheat grazed[1]	Head	175	94	13	---	---
Operator Labor						
Jan.-Apr.	Hour	132	284	490	537	537
May-July	"	506	506	506	506	506
Aug.-Sept.	"	103	99	106	112	112
Oct.-Dec.	"	462	462	462	462	462
Hired labor						
May-July	"	774	599	531	580	580
Wheat and cattle prices at 30% above base						
Beef stockers						
Wheat grazed[1]	Head	173	173	173	173	104
Sudan grazed[2]	"	124	124	124	124	153
Operator labor						
Jan.-Apr.	Hour	399	399	399	399	554
May-July	"	506	506	506	506	506
Aug.-Sept.	"	147	147	147	147	161
Oct.-Dec.	"	462	462	462	462	462
Hired labor						
Jan.-Apr.	"	---	---	---	---	35
May-July	"	983	983	983	983	925
Oct.-Dec.	"	156	156	156	156	65

[1] Fall buy—October 10; winter ration, small grain and oat hay; spring sell May 10.

[2] Fall buy—September 10; winter ration, CSC, range, oat hay; sudan grazing in summer, sold off pasture August 1.

[3] Fall buy—September 10; roughed through winter on range, CSC supplement; sold off grass July 10.

Appendix Table 3.—Optimum Organizations: Cropland Use by Productivity Classes with a Charge of Six Percent on Nonland Capital.

Cropland Type	Enterprise	Unit	Cotton Prices (cents per pound) 13.2	17.6	22.0	26.4	30.8
Wheat and cattle at base prices							
Class b (360 acres)	cotton-fallow[1]	Acre	---	---	---	---	360
	cotton-fallow-wheat[2]	"	---	---	---	360	---
	wheat	"	360	360	360	---	---
Class c (368 acres)	cotton-fallow-wheat[2]	"	---	---	---	322	368
	wheat	"	308	308	308	---	---
	oat hay	"	60	60	60	46	---
Class d (160 acres)	oat hay	"	78	78	78	91	123
	grazed out small grain	"	69	69	69	20	13
	sudan	"	13	13	13	---	---
	Blue Panic-sudan[3]	"	---	---	---	49	24
Class e (112 acres)	sudan	"	112	112	112	112	112
Wheat and cattle prices 30% below base							
Class b (360 acres)	cotton-fallow[1]	"	---	---	360	360	360
	cotton-fallow-wheat[2]	"	---	360	---	---	---
	wheat	"	360	---	---	---	---
Class c (368 acres)	cotton-fallow[1]	"	---	---	---	368	368
	cotton-fallow-wheat[2]	"	---	---	368	---	---
	wheat	"	368	368	---	---	---
Class d (160 acres)	wheat	"	32	---	---	---	---
	oat hay	"	54	29	5	---	---
	grazed out small grain	"	70	38	5	---	---
	idle	"	4	93	150	160	160
Class e (112 acres)	idle	"	112	112	112	112	112
Wheat and cattle prices 30% above base							
Class b (360 acres)	cotton-fallow-wheat[2]	"	---	---	---	---	360
	wheat	"	360	360	360	360	---
Class c (368 acres)	wheat	"	309	309	309	309	316
	oat hay	"	59	59	59	59	52
Class d (160 acres)	oat hay	"	78	78	78	78	86
	grazed out small grain	"	70	70	70	70	41
	Blue Panic-sudan[3]	"	12	12	12	12	33
Class e (112 acres)	sudan	"	112	112	112	112	112

[1] Includes 4 years of cotton and 1 year fallow to control disease.
[2] Includes 4 years of cotton, 1 year of wheat, and 1 year of fallow.
[3] Includes half Blue Panic and half sudan so that Blue Panic may be fully utilized.

Appendix Table 4.—Optimum Organizations: Type of Beef Cattle and Labor Requirements with a Charge of Eighteen Percent on Nonland Capital.

Item	Unit	Cotton Prices (cents per pound) 13.2	17.6	22.0	26.4	30.8
Wheat and cattle at base prices						
Beef stockers						
Wheat grazed[1]	Head	175	175	109	37	25
Operator labor						
Jan.-Apr.	Hour	132	132	289	498	546
May-July	"	506	506	506	506	506
Aug.-Sept.	"	103	103	109	123	129
Oct.-Dec.	"	462	462	462	462	462
Hired labor						
May-July	"	779	779	724	732	794
Oct.-Dec.	"	2	2	---	---	---
Wheat and cattle prices 30% below base						
Operator labor						
Jan.-Apr.	Hour	84	251	485	537	537
May-July	"	506	506	506	506	506
Aug.-Sept.	"	43	50	105	112	112
Oct.-Dec.	"	462	462	462	462	462
Hired labor						
May-July	"	21	2	511	580	580
Wheat and cattle prices 30% above base						
Beef stockers						
Wheat grazed[1]	Head	190	190	190	118	67
Sudan grazed[2]	"	---	---	---	41	69
Native grass fed[3]	"	23	23	23	21	20
Operator labor						
Jan.-Apr.	Hour	119	119	119	362	537
May-July	"	506	506	506	506	506
Aug.-Sept.	"	116	116	116	133	145
Oct.-Dec.	"	462	462	462	462	462
Hired labor						
May-July	"	941	941	941	888	854
Oct.-Dec.	"	63	63	63	---	---

[1] Fall buy—October 10, winter ration small grain and oat hay; spring sell May 10.

[2] Fall buy—September 10, winter ration, CSC, range, oat hay; sudan grazing in the summer, sold off pasture August 1.

[3] Fall buy—September 10; roughed through winter on range, CSC supplement, sold off grass July 10.

Appendix Table 5.—Optimum Organizations: Cropland Use by Productivity Classes with a Charge of Eighteen Percent on Nonland Capital.

Cropland Type	Enterprise	Unit	Cotton Prices (cents per pound) 13.2	17.6	22.0	26.4	30.8
Wheat and cattle at base prices							
Class b (360 acres)	cotton-fallow[1]	Acre	---	---	---	360	360
	cotton-fallow-wheat[2]	"	---	---	360	---	---
	wheat	"	360	360	---	---	---
Class c (368 acres)	cotton-fallow[1]	"	---	---	---	---	368
	cotton-fallow-wheat[2]	"	---	---	---	368	---
	wheat	"	368	368	368	---	---
Class d (160 acres)	wheat	"	35	35	82	133	142
	oat hay	"	55	55	34	12	8
	grazed out small grain	"	70	70	44	15	10
Class e (112 acres)	idle	"	112	112	112	112	112
Wheat and cattle prices 30% below base							
Class b (360 acres)	cotton-fallow[1]	"	---	---	360	360	360
	cotton-fallow-wheat[2]	"	26	360	---	---	---
	wheat	"	334	---	---	---	---
Class c (368 acres)	cotton-fallow[1]	"	---	---	---	368	368
	cotton-fallow-wheat[2]	"	---	---	368	---	---
	idle	"	368	368	---	---	---
Class d (160 acres)	idle	"	160	160	160	160	160
Class e (112 acres)	idle	"	112	112	112	112	112
Wheat and cattle prices 30% above base							
Class b (360 acres)	cotton-fallow-wheat[2]	"	---	---	---	360	360
	wheat	"	360	360	360	---	---
Class c (368 acres)	cotton-fallow-wheat[2]	"	---	---	---	---	296
	wheat	"	368	368	368	368	72
Class d (160 acres)	wheat	"	100	100	100	94	89
	oat hay	"	60	60	60	66	71
Class e (112 acres)	grazed out small grain	"	112	112	112	69	39
	sudan	"	---	---	---	43	73

[1] Includes 4 years of cotton and 1 year fallow to control disease.
[2] Includes 4 years of cotton, 1 year of wheat, and 1 year of fallow.

Oklahoma's Wealth in Agriculture

Agriculture is Oklahoma's number one industry. It has more capital invested and employs more people than any other industry in the state. Farms and ranches alone represent a capital investment of four billion dollars—three billion in land and buildings, one-half billion in machinery and one-half billion in livestock.

Farm income currently amounts to more than $700,000,000 annually. The value added by manufacture of farm products adds another $130,000,000 annually.

Some 175,000 Oklahomans manage and operate its nearly 100,000 farms and ranches. Another 14,000 workers are required to keep farmers supplied with production items. Approximately 300,000 full-time employees are engaged by the firms that market and process Oklahoma farm products.

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