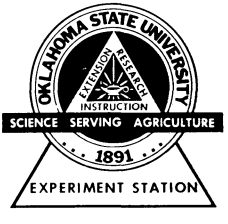
Bulletin B-608

MINIMUM LAND REQUIREMENTS AND ADJUSTMENTS FOR SPECIFIED INCOME LEVELS, SOUTHWESTERN OKLAHOMA

May, 1963



and

U.S.D.A.

CONTENTS

Oklahoma Agricultural Experiment Station and Farm Production Economics Division, Economic Research Service, United States Department of Agriculture

List of Tables

Acknowledgements

This study is part of Regional Research Project S-42, "An Economic Appraisal of Farming Adjustment Opportunities in the Southern Region to Meet Changing Conditions." This Regional Project is financed in part from Research and Marketing Act funds. It is a cooperative effort of the Departments of Agricultural Economics of the following State Agricultural Experiment Stations: Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia; the Farm Production Economics Division, Economic Research Service; and Cooperative State Experiment Station Service of the United States Department of Agriculture. Dr. John W. White, Vice-President for Agriculture, University of Arkansas, is the administrative advisor, and Dr. James H. White, University of Arkansas, is chairman of the Regional Technical Committee.

The Southern Farm Management Research Committee, sponsored by the Farm Foundation and the Southern Agricultural Experiment Station, was helpful in the development of this Regional Project.

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.

The bulletin was developed from a Ph.D. dissertation submitted to the Faculty of the Graduate School of Oklahoma State University in partial fulfillment of the requirements for the Doctor of Philosophy degree by Percy L. Strickland, Jr.

MINIMUM LAND REQUIREMENTS AND ADJUSTMENTS FOR SPECIFIED INCOME LEVELS, SOUTHWESTERN OKLAHOMA

Percy L. Strickland, Jr.,[1] James S. Plaxico,[2] and William F. Lagrone[3]

This bulletin reports results of a study in which estimates were made of the changes required to achieve specified returns in farm income of an 11-county area in Southwestern Oklahoma. The analysis is a normative one[4] designed to determine the quantity of resources farmers would need to bring their income to a level comparable with that of persons employed in nonfarm work.

Maximum rates of economic growth are obtained when each sector of the economy adopts the best technology available and resources are reallocated so that the real return to the various factors of production are the same for each use within and between sectors. When resources are not used in an optimum manner, the net national product of the economy is below the potential maximum. Any "better" allocation of these resources would increase the net national product and the efficiency of the economy.

The specific objectives of this study were:

1. To determine the minimum resources required (land, labor, and capital) to obtain specified returns to farm operator labor and management;

Research reported herein was done under Oklahoma Station Project No. 1040.

---

[1] Farm Production Economics Division, Economic Research Service, U.S.D.A., stationed at Auburn, Alabama, formerly Graduate Assistant, Oklahoma State University.

[2] Department of Agricultural Economics, Oklahoma State University.

[3] Farm Production Economics Division, Economic Research Service, U.S.D.A., stationed at, Stillwater, Oklahoma.

[4] Normative in this context departs from the usual Keynesian concept in that it is not an ethical or value consideration, but simply indicates what might be expected to happen if the specified assumptions are true and decisionmakers react in the manner specified. See Earl O. Heady, "Uses and Concepts in Supply Analysis," **Agricultural Supply Functions,** Earl O. Heady, et al., (ed.) Iowa State University Press, Ames, Iowa, 1961.

2. To determine the combinations of farm enterprises consistent with minimum resource use for given income levels; and

3. To determine the number of farms in the area consistent with these levels of income.

Description of the Area

The geographic area to which this study applies is designated as Economic Area 4 by the 1954 Census (5)[5]. This area is a part of the Low Rolling Plains and is specifically the 11-county area of Oklahoma as shown in Figure 1. The soil features describe the relevant characteristics of the area. The gently sloping soil may have lime deposits within 36 inches of the top, while sandy soils may have no surface lime deposits within this distance, but still may show a neutral surface soil reaction. In most of the soils, plant nutrients, except for nitrogen, are moderately high to high (3).

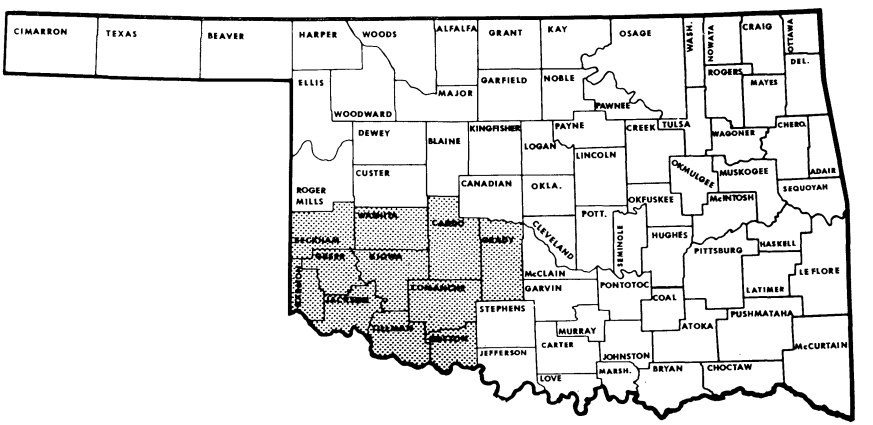


Figure 1. The shaded area shows the eleven counties of the Low Rolling Plains of Southwestern Oklahoma included in the study.

The average annual rainfall of the area ranges from 32 inches in the eastern part to 22 inches in the western part near the Texas border. The growing season ranges from 190 to 225 days.

On the basis of groupings of soils according to major physical soil characteristics, the area has three distinct soil classifications. These are clay, denoted as (C), loam (L), and sandy (S). Each of these soil groups is found in abundance throughout the area. Each soil group is con-

[5] Figures in parentheses refer to Literature Cited.

sidered separately in the study. In addition to a division by major soil groups, each group has been subdivided into productivity classes, principally on the basis of depth of topsoil and topography. These classes are referred to as *a, b, c, d, e,* with *a* being the most productive soil.

The area is a farming region with no major metropolitan areas. The towns and cities are relatively small, and the basic economy is closely associated with agriculture or agriculturally-related industries. The area is within close shipping distance of major livestock, and grain terminals so that an organized market is available for the agricultural products produced.

Most of the farm labor used is family labor. Some outside labor is available for cotton chopping and harvesting work. Most of the wheat harvesting is done by custom combine crews.

Two justifications for accepting income goals as a decision criterion are: (1) the income level maintains the "status quo," and meets the "satisfaction" criteria, and (2) the income level represents the "opportunity cost" of farming (6).

In a full employment economy, there is competition for the use of labor and there are employees with varying degrees of training and ability. Varying wage levels usually differentiate the ability and training of employees. One could view the nonfarm income to workers with a given ability and training as an "opportunity cost" of farming. Thus, other things equal, one would desire a return to his labor and management in agriculture equal to the return to similar labor in nonfarm employment. Other things not equal, the farmer may have compensating benefits so that he would accept a return lower than the "opportunity" return in nonfarm employment.

From the standpoint of society, efficient resource use is necessary for optimum production and growth in the economy. The maximum efficiency level is, in general, attainable only when the marginal value productivity of resources is equal among all of the various uses of the resources.

The primary purpose of this analysis is to determine the minimum resources required to provide specified operator labor and management returns in a selected agricultural area. The analysis assumes an efficiently organized agriculture and the results are intended to indicate the implied adjustments for an efficient economy. Therefore, the income levels used are designed to represent levels of "opportunity cost" of farm-

ing and to represent the efficiency criterion of equating the returns to labor in its various uses.

Levels of Income

The question now arises as to what level of income to operator labor and management will approximate the level of income in nonfarm employment. Equalizing the money income between the two employments may not equalize "real income." A dollar in an urban environment may not have the same purchasing power as in a rural area. There may be some nonmonetary income to farm operators that nonfarm employees cannot obtain, and vice versa. Also, farmers may benefit from farm-produced food and other perquisites. Real estate values may be such that farm housing costs less than urban housing.

Operational Model

Method of Analysis

The operational model for this analysis is developed within the general framework of the linear programming technique. A two-dimensional model showing the theoretical application of the minimizing criterion is shown in Figure 2. In this figure, the land resource is shown on the Y axis and all other resources are shown on the X axis.

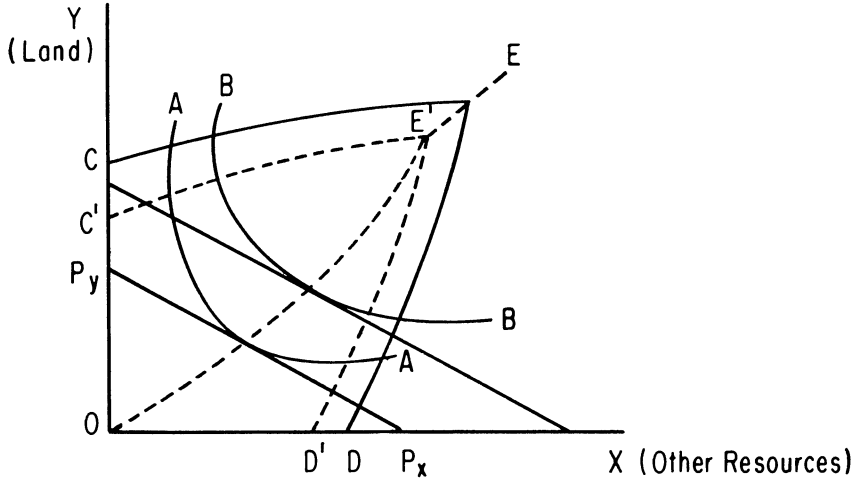


Figure 2. Illustration of cost minimization.

The curves AA and BB are iso-product curves, each consisting of the loci of points, where the same income can be produced with different

combinations of land and other resources. The line CE is the ridge line showing the points where further increases in the use of land will require the same or larger quantities of other resources to produce the same income. Line DE is the ridge line for other resources. The broken lines C'E' and D'E' are pseudo-scale lines. These indicate the loci of points on the iso-product curves where the marginal-value product of land (C'E') and the marginal-value product of other resources (D'E') are equal to the price of land and other resources, respectively.

With a given set of prices for land and other resources, a price ratio or iso-cost line P_yP_x can be constructed. This line shows different levels of land and other resources which can be purchased for the same total cost. The point at which this line is tangent to the iso-product curve is the least-cost combination of land and other resources to produce this level of income. The expansion path OE shows the loci of all such points for the different levels of income. With perfect knowledge of prices and production coefficients, the minimum-cost criterion gives the best solution to the problem. However, difficulty of estimation, especially for the land price of the area, causes some reservation as to the reliability of the solution using the minimum-cost criterion.

It is possible to use other criteria which minimize any one of the individual resource requirements—that is, the labor requirement, the capital requirement, or the land requirement. Within the area, labor is perhaps ample. Thus, minimizing the labor requirement does not seem to be useful. Land investment is the largest proportion of the total capital requirement, so that minimizing the capital requirement and minimizing the land requirement should give almost identical solutions.

The minimum-land criterion minimizes the quantity of land used to produce a level of income and also uses the most profitable quantity of other resources on this minimum quantity of land. This criterion, in terms of the theoretical model, combines other resources with an acre of land to the point at which the marginal-value product of these resources is equal to the price of the resources, or extends out to the pseudo-scale line (D'E'). Land and other resource use is increased in combinations along the line D'E' until an iso-product curve is reached, which gives the desired income. This solution, or combination of resources, is the "best" combination to use if land is actually fixed at this level and other resources are used at their most profitable level on this quantity of land.

Likely, the substitution ratio or iso-product lines for land and

other resources are relatively steep. Therefore, the actual least-cost expansion path may be near the pseudo-scale line for nonland resources (D'E'). There is some bias in using the minimum-land criterion. The magnitude of this bias depends on the range over which land may be substituted for other resources and on the ratio between the price of land and the prices of other resources.

The minimum-land criterion was chosen for this analysis. Use of this criterion seems feasible because:

1. It should eliminate some of the error involved in estimating a specific price for land.
2. Preliminary investigation indicates that this solution is approximately the same as the solution for the minimum-capital criterion.
3. If the assumed price and resource substitution rates are correct, the minimum-land solution approaches the "true" least-cost expansion path.

In constructing the empirical model, efforts were made to minimize the bias inherent in the minimum-land criterion. Primarily, land-based enterprises were chosen as alternatives in the model. This should make the iso-product or iso-income curves steeper, and move the pseudo scale line D'E' along which the model expands near the assumed true least-cost expansion path.

The technique of the model is to minimize the land requirement function (3.1) $L = CP'$
where $C = (c_1, c_2, \ldots, c_n)$
specifies the land required by each of the productive processes.

The program procedure determines the minimum land required and the optimum combination of processes to be used on the land. The a_{ij} values for each process show the amount of each resource required to produce one unit of the process. From these, the total requirement for each of the resources can be obtained.

Restrictions

Within the area some of the land is being utilized in farming enterprises for which little adjustment would be made under changing price conditions. The land areas used in these enterprises were eliminated from consideration in this study. Such enterprises include livestock ranches, for which adjustment to crops would be impractical because their soil resources are suited primarily for native pasture and grazing.

Table 1.—Distribution of Land in Farms and Number of Farms According to Major Soil Groupings and of Cropland by Soil Productivity Classes, Low Rolling Plains, Southwestern Oklahoma

Soil productivity classes	Major Soil Groups							
	Level Loam		Rolling Loam		Sandy		Clay	
	Total acres	Included acres[1]	Total acres	Included acres[1]	Total acres	Included acres[1]	Total acres	Included acres[1]
a	469,193	335,942	67,325	48,203	----	----	----	----
b	289,565	207,329	128,330	91,884	133,821	95,816	359,647	257,507
c	79,881	57,195	150,921	108,059	396,090	283,600	416,060	297,899
d	188	135	103,909	74,399	191,775	137,311	180,666	129,357
e	6,147	4,401	59,685	42,734	29,080	20,821	134,199	96,080
Total cropland	844,974	605,002	510,170	365,279	750,766	537,548	1,090,572	780,843
Native pasture	274,842	117,083	591,271	251,881	588,375	250,648	696,110	296,543
Total acres	1,119,816	722,085	1,101,441	617,160	1,339,141	788,196	1,786,682	1,077,386
Number of farms	3,547	2,361	3,434	1,771	4,581	2,684	4,498	2,447

[1]Certain farmland was excluded from the total for the area for aggregating purposes in this study.

Grade A dairying was not considered as an adjustment possibility because of the limited market for milk. Because of limited demand for their products, vegetable farms, fruit and nut farms, specialty crop farms and poultry farms were excluded as alternatives. Irrigated land was also excluded from consideration.

On the basis of available soils inventory information, the total land in the area was divided into four major soil groups and subdivided into soil productivity classes (Table 1). Acreage in the excluded land uses, obtained from 1959 census information, was also divided into the various soil categories and was subtracted from the total land area. Similarly, the total number of farms was divided into included and excluded groups by soil categories.

A separate analysis is made for each of the four specified soil resource situations: Clay, level loam, rolling loam, and sandy. It is assumed that each analysis represents the distribution of the land productivity classes for the soil situations of the entire area (Table 2). Current acreage allotments (as determined from a sample survey of farms and the State ASCS office records) are used in the analyses.

Price Assumptions The product prices used are estimates of the 1961

Table 2.—Estimated Percentage Distribution of Major Soil Groups by Soil Productivity Classes and Proportion of Cropland in Cotton and Wheat Allotments, Low Rolling Plains, Southwestern Oklahoma

Soil productivity class	Soil Group			
	Level Loam	Rolling Loam	Sandy	Clay
		— Percent —		
a	43.75	10.42	0	0
b	27.08	19.27	19.53	28.12
c	6.25	23.44	35.94	28.75
d	0	15.62	19.53	12.50
e	1.04	9.38	3.13	8.75
Cropland total	78.12	78.13	78.13	78.12
Native pasture	18.30	18.23	17.97	18.36
Cotton allotment	15.62	14.84	24.21	9.37
Wheat allotment	22.65	26.56	10.15	37.50

prices received by farmers (Appendix A, Tables 1 and 2). The 1961 support price, adjusted for grade and storage differential, is used for cotton, wheat, oats, and grain sorghum. The 1960-61 season average price, adjusted for seasonal variation, is used as an estimate of the price of alfalfa hay at harvestime in 1961. Other prices are estimated from current market reports for farm commodities. Resource prices used in the study were obtained by compiling and averaging current price data obtained from equipment and farm supply dealers within the area of the study and from secondary sources (Appendix A, Table 3).

The land prices used are based on 1961 land transactions in the area and on values estimated by farm appraisers. A summary of recent 1960 sealed-bid sales of Indian farmland within the area was also used in estimating land prices.

The land price used for each soil group is a weighted average price which reflects the typical acre for the soil resource situations. That is, each acre is assumed to have the same proportion of all productivity classes of soils as was determined for the area. The price assumed includes service buildings, but does not include any value for dwellings, mineral rights, or other nonagricultural use values.

The analysis is made with four variations in land prices: (1) current price for each soil, (2) 25 percent below current price, (3) 25 percent above current price, and (4) 50 percent above current price. Three labor price levels programmed are: (1) current price, (2) 50 percent above current price, and (3) 100 percent above current price. Some notion of the effect of future price changes can be gained by varying the price around the estimated current level.

Technology and Management Level The adoption of improved technology on present farms has not always kept pace with developments. The objective of this research is to determine the most efficient organization of farms to give specified income levels; thus, the technology and management assumed is the optimum level currently available (1962).

Capital An interest charge of six percent per year is used for operating capital to purchase seed, fertilizer, cattle, machinery, and so on. The capital requirement for land investment is charged at five percent per year.

Interest charges are designed to reflect assumed market rates for capital. The programming model is designed to determine the total

amount of capital required, but interest is charged only on the time for which it was used.

Tenure The farm tenure situation assumed is that of an owner operator. Although many farmers within the area own some land and rent or lease more land, in a long-run competitive situation land rents could be expected to approach the ownership cost of the land. The ownership costs of the land assumed include taxes and a five percent return on investment which should approximate the "rent cost" of land. Thus, the analysis should yield similar results regardless of the tenure situation.

Labor The operator is assumed to work full-time on the farm with labor available for farm operations reduced by the amount of time estimated for management. The maximum labor available for actual farm work by the farm operator is assumed to be 501 hours during the period of January through April, 425 hours during May through July, 325 hours in August and September, and 422 hours during October through December. No other family labor is assumed in this analysis.

The current rate assumed ($1.00 per hour) is approximately the rate for hired farm labor in the northern part of the area, but slightly higher than in the southern part.

Machine harvesting of crops is budgeted on a custom-hire basis. The 1961 custom rate charged is designed to account for operating capital, including both the cost of the machinery and the operating cost of gas, oil, and labor for the operation.

The analyses for the various labor prices are made without considering corresponding changes in contract prices. This would not significantly alter the program optimum because labor (except for cotton hoeing) is only a small portion of the contract charges. In the case of cotton hoeing, chemical and mechanical weed control measures are now available at costs similar to those assumed for hand labor.

Machinery One 4-row tractor and complement of machinery for each of the soil resource situations was first assumed and preliminary program solutions for the $3,000 income level were obtained. Based upon examination of acres of the different crops and the estimated range in days over which required operations could be accomplished, the maximum acreage of cropland and total land that could be handled with the original complement of machinery was calculated. In the final programming model, interest and depreciation for the first complement of machinery was a requirement for any size farm at any income level.

At total land (78 percent cropland) acreages above the maximum, additional machinery investment, interest, and depreciation were calculated at a minimum rate per acre based on the average cost for the maximum acreage. Therefore, a continuous function of machinery investment per acre was assumed after full use of the first 4-row complement was attained.

Even though machinery is a lumpy input, a continuous function of machinery investment appears reasonable if we consider possible adjustments in size and use of equipment items on the larger farms. Larger sizes than assumed of planting and some cultivating equipment are available which can be handled by the 4-row tractor. If two tractors are necessary, specialized use of the second tractor may permit using a smaller tractor or purchasing a used one. Variable cash costs such as fuel, oil, and repairs for tractors and equipment are charged in the enterprise budgets at an estimated cost per hour of use.

Overhead Cost Expenses in total costs not included in the process budgets are grouped together into a category called "overhead cost." The expenses include pickup truck operation, telephone, bookkeeping and

Table 3.—Assumed Annual Overhead Cost by Size of Farm, Low Rolling Plains of Southwestern Oklahoma

Item	Size of Farm		
	Small	Medium	Large
		— Dollars —	
Pickup truck			
Interest	$ 60.00	$ 66.00	$ 72.00
Depreciation	160.00	175.00	200.00
Gas, oil, lubrication	110.00	166.00	223.00
Repair	90.00	120.00	150.00
Insurance	70.00	78.00	85.00
Telephone	75.00	90.00	105.00
Bookkeeping and tax service	120.00	150.00	180.00
Insurance on buildings and workers	100.00	120.00	150.00
Total overhead costs	$785.00	$965.00	$1,165.00
Truck acquisition price	$1,800.00	$1,800.00	$1,800.00
Truck salvage value	200.00	400.00	600.00
Years to depreciate	10	8	6

tax service, and insurance. As in estimation of machinery interest and depreciation charges, preliminary programming was used to check the reasonableness of overhead cost. A minimum charge was estimated for farms with less than 700 acres of total land and a rate of $1.25 per acre was charged in all programs for farms with more than 700 acres (Table 3).

Included Processes Budgets were derived for the enterprises which were considered feasible and for which there was a sufficient market to permit them to be considered by all farmers as adjustment opportunities. They include cotton, cash grain crops, grazing crops, hay and beef-calf and stocker-feeder enterprises (1, 2, 4).

Alfalfa usually requires reseeding every four or five years and should be rotated for disease control. Therefore, alfalfa production is restricted to one-fourth of the cropland in productivity classes *a* and *b* on loam soils and classes *b* and *c* on sandy soils.

Grain sorghum production has been restricted to 60 percent of the cropland on loam and sandy soils. The budget used requires a five-year sorghum and one-year fallow rotation.

Income Targets In determining income targets, industries were selected which would represent highly skilled, skilled and semiskilled workers. The average wage per employee in each of these industries was obtained for both the United States and Oklahoma for the year 1960 (Table 4). For Oklahoma, these average wages ranged from $6,005 for petroleum products manufacturing industries to $2,246 for wearing-apparel making industries. Petroleum products industries require, on the average, highly trained and skilled employees, whereas the wearing apparel industries require little previous training of employees. The average wage for all manufacturing industries in the United States in 1959 was $4,705.

In comparing nonfarm and farm incomes, some adjustments might be made for differences in real income. The investment in land in the programs does not include a dwelling. Therefore, farm housing costs would be in addition to the estimated cost of the operation. However, no attempt has been made to make such adjustments.

Three levels of return to operator labor and management are considered—$3,000, $5,000, and $7,000. To the individual farmer, these would approximate the return to semiskilled, skilled, and highly skilled labor in nonfarm employment. From an economic efficiency standpoint, the $3,000 return might represent a minimum average farm return at

Table 4.—Average Annual Wage per Full Time Employee for Selected Industries in the United States and in Oklahoma, 1960

Type of industry	Average Wage	
	United States[1]	Oklahoma[2]
	— Dollars —	
All industries	4,705	--
Farming	1,729	--
Selected industries		
Manufacturing industries		
Petroleum and coal products	6,950	6,005
Primary metals	6,341	4,529
Machinery, except electrical	6,025	4,467
Fabricated metals	5,823	4,489
Stone, clay, and glass	5,337	4,519
Food and kindred products	4,900	4,057
Lumber and wood products	3,785	3,223
Wearing apparel	3,312	2,246
Wholesale trade	6,020	4,497
Oil and gas mining	5,924	5,333
Printing and publishing	5,610	4,683
Contract construction	5,488	5,198
Retail trade	3,849	3,145

[1]**Survey of Current Business,** U. S. Bureau of the Census, Office of Business Economics, July 1961.

[2]**Handbook of Oklahoma Employment Statistics,** Oklahoma Employment Security Commission, Research and Planning Division, April 1961.

present. The $5,000 return would represent approximately the present average return to nonfarm labor. The $7,000 return might represent expected returns from positions requiring managerial skills.

Programmed Minimum Requirements

For each of the four soil resource situations, linear programming computations were made to determine the minimum land requirement and the optimum combination of enterprises to obtain three levels of return. Separate estimates were made for all combinations of four land prices and three hired labor prices. The program results provide esti-

mates of (1) the minimum acreage required to obtain the specified level of return, (2) the optimum combination of enterprises, (3) the operating capital requirement, and (4) the hired labor requirement. From the program results, it is possible to compute (1) gross receipts, (2) operating expenses, (3) investment in land and machinery, and (4) returns to land, machinery, and operator labor and management.

These results are presented in Appendix B. Only the cropland and the total capital requirement are discussed in this section. Results are presented separately for each of the soil situations.

Returns to Operator Labor and Management

The minimum acreage of cropland and associated capital required to obtain specified levels of operator labor and management income are shown in summary form in the following tabulation. The estimates are based on 1961 land prices, wage rates, and crop allotments:

Soil group	Minimum acreage for operator income of—			Total capital requirement for operator income of—		
	$3,000	$5,000	$7,000	$3,000	$5,000	$7,000
	Acres			Thousand dollars		
Level loam	334	535	767	121	191	273
Sandy	344	588	822	93	159	221
Clay	546	866	1,206	111	172	237
Rolling loam	691	1,652	2,694	186	438	716

These results indicate that the smallest land acreage is required on level loam soils and the greatest on the rolling loam soils, to obtain a given income level. Although land requirements on the sandy soils are slightly greater than on the level loam, total capital requirements are least on the sandy soils and greatest on the rolling loam. Cropland requirements are about 64 percent greater, but capital requirements are less on clay soils than on level loam soils, and only slightly greater than total capital requirements on sandy soils.

A comparison of the combination of total requirements for a given income for level loam, clay, and sandy soils suggests that these soils are now priced in proportion to their productivity. Additional land requirements on clay soils are balanced by lower land prices. Lower capital requirements on sandy soils are balanced by greater operator labor requirements. Total resource requirements for the rolling loam soils are greater and appear out of proportion to the other three soil resource situations. If the price of rolling loam soils is reduced 25 percent below the current level, total capital and operator labor require-

ments are comparable to the results obtained in the other soil resource situations at current land and hired labor prices.

Any postulated change in land price alters the results for each soil resource situation. At the current hired labor wage, each of the income levels can be attained on clay, level loam, and sandy soils even though land prices are increased 25 percent. The smallest increases in land and total capital are required on sandy farms, with the largest increases on level loam farms.

If the price of rolling loam land is increased 25 percent above current levels, none of the income targets can be reached. At the current wage level and a 50-percent increase in land prices, each of the incomes can be reached on clay and sandy soil resource situations.

The hired labor needed to obtain any of the incomes depends on the land requirement to obtain that income. If the land requirement is small enough to require little or no hired labor for the operation, changes in the hired labor price alter the results little, if any. Since the low average productivity of rolling loam soils results in relatively large land requirements at any income level, changes in hired labor prices result in significantly different minimum requirements at the same income level. In fact, at current prices for land, none of the income levels can be reached if hired labor is paid at a rate of $2.00 per hour.

For soils other than the rolling loam situation, only a small quantity of hired labor is required, even for the $7,000 income level. Therefore, increasing the hired labor price increases resource requirements only slightly. At land prices above the estimated current price, increasing the hired labor price significantly increases resource requirements.

In the program solutions, the five percent return to land investment with land priced at 25 percent below the current price is the same as a 3.75 percent return to land investment with land priced at the current level. By adjusting the figure for land investment, resource requirements can be easily adjusted for a lower or higher return to land investment.

The results indicate that if land prices are increased above current price on any of the soils, resource requirements increase greatly. Technology assumed in the study is the most efficient presently available for dryland farms in the area. This seems to suggest that farm land is presently being valued not on the basis of present productivity and income possibilities, but on the basis of productivity and income possibilities in the future. Thus, the present land price may be based on the

future expectations of the land purchasers as to prices, technology, and alternatives.

The combination of enterprises remains essentially the same at all levels of income, land prices, and hired labor rates for which solutions were obtained. The allotments of wheat and cotton, calculated as a percentage of cropland, are planted in each situation. Nonallotment cropland on clay farms is used principally for small-grain hay and grazing crops and sudan for temporary summer grazing. Available forage from crops and permanent pasture is utilized by stocker calves purchased in early fall and sold as yearling feeders the following spring or summer. Most of the cropland on level loam farms not used for cotton and wheat is planted to alfalfa and grain sorghum for sale. The small acreage of poorer quality land is planted to small-grain hay and grazing crops for use by stocker calves. On rolling loam farms, nonallotment cropland is used for alfalfa, grain sorghums, and small-grain grazing and hay. In addition, about 12 percent of the cropland is reseeded to permanent grasses. Both beef cows and calves use available forage. Nonallotment cropland on sandy land farms is utilized much like that on rolling loam farms, with 18 percent of the cropland acreage being reseeded to permanent grasses.

Compared with the average organization of present farms in the area, considerably more alfalfa would be grown on level loam, rolling loam, and sandy farms. Also, grain sorghums would be of more importance on these farms. Small-grain hay would be substituted for summer hay crops, other than alfalfa. Grazing crops would be planted on much of the cropland now idle.

Returns to Operator-Owned Resources

Prior discussions have dealt with minimum requirements to obtain specified levels of operator labor and management income assuming that interest on all investment in land and machinery was an expense. Therefore, income from interest on present equities in land and machinery is available to many farmers for family living, debt repayment, or farm enlargement through land purchase. Most farmers do not separate available income into returns to owned capital and to their own labor and management. Many farmers are interested in additional land needed to obtain a specified income as a combination return to owned capital and to operator labor and management.

On each of the four soil situations, the modal size of farm owned by present operators is 160 acres of land. Linear programming techniques

are used to determine the quantity of land needed, in addition to the 160 acres, to obtain each specified income level. In constructing the model for this analysis, the same land composition and labor restrictions assumed in the previous model are used. The operator is assumed to own 160 acres of land with no interest charge required for this land. Also, the operator is assumed to own the machinery required to operate 125 acres of cropland. No interest is charged on the investment in this machinery but, depreciation is charged to replace worn out machinery. Both depreciation and interest are charged on additional machinery needed. Additional land required is purchased at an interest charge of five percent and both interest and principal on additional land are amortized in 33 equal annual payments. Current land and hired labor prices only are used in this analysis.

On clay soils, a $3,000 return to operator-owned resources can be obtained on a minimum of 449 acres of cropland which requires the purchase of 324 acres in addition to the 125 acres already owned (Table 5). A $5,000 return to operator-owned resources can be obtained on a minimum of 815 acres of cropland, 690 acres of which must be purchased. A minimum of 1,210 acres of cropland is required to obtain a $7,000 return to operator-owned resources, requiring the purchase of 1,085 additional acres.

Table 5.—Estimated Minimum Cropland[1] Required to Obtain Specified Returns to Operator-Owned Resources,[2] Specified Soil Situations, Low Rolling Plains of Southwestern Oklahoma, Current Land, Hired Labor Prices

Soil situation	Requirement	Unit	Specified return		
			$3,000	$5,000	$7,000
Clay					
	Total Cropland	Acres	449	815	1,210
	Purchased cropland	Acres	324	690	1,085
Level Loam					
	Total Cropland	Acres	186	443	769
	Purchased cropland	Acres	61	318	644
Rolling Loam					
	Total Cropland	Acres	593	1,342	2,216
	Purchased cropland	Acres	468	1,217	2,091
Sandy					
	Total Cropland	Acres	237	526	829
	Purchased cropland	Acres	112	401	704

[1]Cropland is 78.12 percent of the total land.

[2]Returns to operator labor and management, 160 acres of land (125 acres of cropland) and farm machinery.

On level loam soils, a minimum of 186 acres of cropland is required to obtain a $3,000 return to operator-owned resources. This requires the purchase of 61 additional acres. A $5,000 return to operator-owned resources can be obtained on a minimum of 443 acres of cropland, involving the purchase of 318 additional acres. A minimum of 769 acres of cropland is required to obtain a $7,000 return to operator-owned resources, requiring the purchase of 644 additional acres.

On rolling loam soils, a $3,000 return to operator-owned resources can be obtained on a minimum of 593 acres of cropland. A minimum of 1,342 acres of cropland is required to obtain a $5,000 return to operator-owned resources. This would require the purchase of 1,217 acres of cropland in addition to that already owned. A $7,000 return could be obtained on a minimum of 2,216 acres of cropland which would require the purchase of 2,091 acres.

On sandy soils the minimum cropland requirement to obtain a $3,000 return to operator-owned resources is 237 acres, with the purchase of 112 acres required. A $5,000 return to operator-owned resources can be obtained with a minimum of 526 acres of cropland, of which 401 acres would be purchased. The minimum cropland requirement to obtain a $7,000 return to operator-owned resources is 829 acres, with the purchase of 704 additional acres required.

Since interest income on 160 acres of owned land and required machinery is available to meet part of the income target, fewer acres of land may be required to obtain specified returns to operator-owned resources than returns to operator labor and management. As expected, a $3,000 return to operator-owned resources can be obtained on fewer cropland acres on each of the four soil situations than a $3,000 return to operator labor and management (Table 6). The difference ranges from 97 acres for clay to 148 acres for level loam soils. These smaller farms also require less capital to operate. The difference in operating capital ranges from $2,664 for sandy soil farms to $4,595 for clay farms.

Also, fewer cropland acres are required for a $5,000 return to operator-owned resources than a $5,000 return to operator labor and management. The difference at this level of return ranges from 51 fewer acres on clay farms to 310 fewer acres on rolling loam farms. The difference in operating capital ranges from $2,420 less on clay farms to $9,698 less on rolling loam farms.

For a $7,000 return, the minimum requirements are approximately the same for the two analyses on clay, level loam, and sandy soils. This

Table 6.—Comparison of the Minimum Land and Operating Capital Requirement to Obtain the Specified Incomes as Returns to Owned Resources and Returns to Operator Labor and Management, Current Land and Labor Prices

		Income levels					
		$3,000		$5,000		$7,000	
Type of soil	Unit	Requirement for return to owned resources[1]	Requirement for return to operator labor and management	Requirement for return to owned resources	Requirement for return to operator labor and management	Requirement for return to owned resources	Requirement for return to operator labor and management
Clay							
Cropland	Acres	449	546	815	866	1,210	1,206
Operating capital	Dollars	20,428	25,023	37,496	39,916	56,255	56,103
Level Loam							
Cropland	Acres	186	334	443	535	769	767
Operating capital	Dollars	5,412	9,933	13,397	16,219	23,621	23,572
Rolling Loam							
Cropland	Acres	593	691	1,342	1,652	2,216	2,694
Operating capital	Dollars	17,438	20,469	40,541	50,239	67,896	82,969
Sandy							
Cropland	Acres	237	344	526	588	829	822
Operating capital	Dollars	11,541	14,205	21,572	24,690	35,326	37,538

[1]Return to investment in 160 acres of land and required machinery and operator labor and management.

occurs because the annual payment of principal and interest to purchase additional land, plus the interest on additional machinery required, equals the 5-percent interest on all land and 6-percent interest on all machinery required to furnish a $7,000 return to operator labor and management. On rolling loam soils, a $7,000 return to operator-owned resources can be obtained on 478 fewer acres of cropland than a $7,000 return to operator labor and management.

An analysis for level loam soils only was made with the assumptions of 320 and 640 acres of owned land and required machinery. Using the $1.00 per hour labor charge, 320 acres of owned land would return $6,570 as a combination return to owned land and machinery and the farm operator's labor and management. At the interest rates of five percent for land and six percent for machinery investment, slightly more than two-thirds of the $6,570 return may be considered as a return to owned land and machinery. Full ownership of 640 acres of level loam land and required machinery would result in an income of $13,339 to investment in land and machinery and to operator labor and management. Again, about two-thirds, $8,539, of this return may be considered as a return to owned land and machinery.

Within a soil resource situation, the patterns of land use and the relative importance of enterprises are similar for all comparisons considered in the analysis of returns to operator-owned resources. They are also similar to the results obtained in the prior analysis of minimum requirements to provide various levels of returns to operator labor and management.

With current land prices, the analysis of returns to owned resources indicates the importance of present equities in land to returns available for family living or for land purchase. For both the $3,000 and $5,000 income as a combination return to 160 acres of owned land and machinery, less total land is required than for similar returns to operator labor and management (with a required interest charge of 5 percent on all land and 6 percent on machinery investment). At the $7,000 income level, total acreage required is approximately the same for both returns on the level loam, clay, and sandy soil situations. Less total rolling loam land is required for a $7,000 return to owned resources than for a return to operator labor and management only.

Since the operator is required to purchase the additional land needed, equity increases over the repayment period until full ownership is attained at the end of the 33-year amortization period assumed. Under this assumption, capital accumulation is occurring while the specified

income level is being maintained. Returns to labor and management only include no capital accumulation but assume merely that specified interest rates on land and machinery investment be paid. Left unanswered are questions of the ability of operators with specified equities in 160 acres of land and the required machinery to obtain additional financing, particularly for the higher income levels.

Implications for Adjustment

If all farmers adjust farm size and enterprise combinations to the optimum level indicated in the program results, there will be a substantial change in the number of farms and in the area acreage of some crops. Indicated adjustments in farm numbers and implications of the results programmed at current land and hired labor prices on each of the soil resource situations are presented in this section. Adjustments in farm numbers for each combination of land and hired labor price are shown in Appendix C.

Minimum Adjustment in Farm Numbers

The present number of farms and the acreage of cropland in each soil group were determined from the preliminary 1959 census of agriculture data and from a sample survey of farms within the area (Table 1). The maximum number of farms consistent with the various income levels was determined by dividing the minimum cropland acreage required to obtain the specified return to operator labor and management for each of the soil groups into the total acres of cropland included in that soil group. This would be the maximum number of farms consistent with the various income levels if all farms were of the minimum size. The difference between the present number of farms and the estimated maximum number of farms for the specified return would be the minimum possible adjustment required in farm numbers.

There are some farms which are already as large or larger than the minimum acreage required to obtain the specified returns. Therefore, the minimum adjustment reported understates the adjustment which would be required, given the present farm-size distribution.

The present farm-size distribution was estimated for each of the soil groups (Appendix C, Figures 1, 2, 3, and 4). The estimated number of farms which are presently above the minimum size required to generate the target income, and the cropland acreage in these farms, were subtracted from the total number of farms and total cropland acreage for each soil group. The remainder of the cropland was then assumed to be adjusted into farms of the minimum size required to obtain the

specified income. Therefore, given the present farm-size distribution, the number of farms consistent with the desired return would be the number of farms presently above the minimum level, plus the number of farms possible of the minimum size on the remainder of the cropland acreage.

Adjustment for $3,000 Return

Adjustment to the minimum-size farm consistent with the $3,000 return to operator labor and management would decrease the number of farms on each of the soil groups. For the area, as a whole, the number of farms would decrease by 3,930 or 42.4 percent (Table 7). This would involve changing from 9,263 farms presently in the area to 5,333 farms.

The largest decrease in number of farms would occur on rolling loam soils. Presently there are 1,771 farms on this soil group. To achieve 529 farms consistent with $3,000 return would require a decrease

Table 7.—Maximum Number of Farms Consistent with $3,000 Return to Operator Labor and Management, Minimum Change and Percentage Change in Farm Numbers from Present Level, Specified Soil Situations, Current Land and Hired Labor Prices, Low Rolling Plains of Southwestern Oklahoma

Soil type	Present level	Programmed minimum requirement per farm	Maximum possible after adjustment	Minimum change in farm numbers
Sandy				
Number of farms	2,684	--	1,563	—1,121
Cropland	537,548	344	--	--
Percent change	--	--	--	41.8
Clay				
Number of farms	2,447	--	1,430	—1,017
Cropland	780,843	546	--	--
Percent change	--	--	--	41.6
Level Loam				
Number of farms	2,361	--	1,811	—550
Cropland	605,002	334	--	--
Percent change	--	--	--	23.3
Rolling Loam				
Number of farms	1,771	--	529	—1,242
Cropland	365,279	691	--	--
Percent change	--	--	--	70.1
Area				
Number of farms	9,263	--	5,333	—3,930
Cropland	2,288,672	--	--	--
Percent change	--	--	--	42.4

Table 8.—Maximum Number of Farms Consistent With $3,000 Return to Operator Labor and Management, Minimum Change and Percentage Change in Farm Numbers from Present Level, Adjusted for Farm Units Currently Above the Minimum Requirement Level, Specified Soil Situations, Low Rolling Plains of Southwestern Oklahoma, Current Land and Hired Labor Prices

Soil type	Present level	Programmed minimum requirement per farm	Presently above minimum requirement	Resources to be adjusted	Maximum possible on adjustable resources	Total of all resources after adjustment	Minimum change in farm numbers
Sandy							
Number of farms	2,684	--	432	2,252	950	1,382	—1,302
Cropland	537,548	344	210,773	326,775	326,800	537,573	--
Percent change	--	--	--	--	--	--	48.5
Clay							
Number of farms	2,447	--	449	1,998	760	1,209	—1,238
Cropland	780,843	546	365,438	415,005	414,960	780,398	--
Percent change	--	--	--	--	--	--	50.6
Level Loam							
Number of farms	2,361	--	699	1,662	638	1,387	—974
Crop'and	605,002	334	375,100	229,902	229,792	604,892	--
Percent change	--	--	--	--	--	--	41.3
Rolling Loam							
Number of farms	1,771	--	33	1,738	492	529	—1,242
Cropland	365,279	691	25,354	339,925	339,972	365,326	--
Percent change	--	--	--	--	--	--	70.1
Area							
Number of farms	9,263	--	1,613	7,650	2,890	4,503	—4,760
Cropland	2,288,672	--	976,665	1,312,007	1,312,007	2,238,789	
Percent change	--	--	--	--	--	--	51.4

of 1,242 farms or 70.1 percent. The smallest change would be required on level loam soils. On this soil group there are presently 2,361 farms. The maximum number of farms consistent with a $3,000 return would be 1,811, a decrease of 550 farms or 23.3 percent.

Adjustment Assuming Present Size Distribution Within the area, there are presently 1,613 farms above the minimum cropland acreage needed to obtain the $3,000 return to operator labor and management (Table 8). These farms include 976,665 acres of cropland. For the different soil groups the range is from 33 farms above the minimum requirement on rolling loam soil to 699 farms above the minimum requirement on level loam soil.

On each soil group the acres of cropland in farms below the minimum size are assumed to be combined into farms of the minimum size required. For the area, a maximum of 2,890 farms would be possible on these resources. By adding the number of farms presently above the minimum level and the number of farms possible on the cropland presently in farms below the minimum level, the total number of farms which would be possible, given current farm-size distribution is found to be 4,503. This would be a decrease of 4,760 farms or a 51.4-percent decrease.

The largest decrease again would be in rolling loam farms where a decrease of 70.1 percent in farm numbers would be required. The smallest decrease (41.3 percent) would be required on level loam soil.

Adjustment for $5,000 Return

With all the cropland adjusted into farming units of the minimum size required for a $5,000 return to operator labor and management, the number of farms in the area would be decreased from 9,263 to 3,168 (Table 9). This would be a decrease of 6,095 farms, or 65.8 percent.

The largest percentage decrease would occur in rolling loam farms. Farm numbers on these soils would have to be decreased from 1,771 to 221 farms, or 87.5 percent. The largest absolute decrease in numbers would occur in sandy soil farms. Farm numbers on this type soil would have to be reduced from 2,684 to 914 farms, a decrease of 66.0 percent.

The smallest reduction would occur in number of level loam farms, where the number would be reduced from 2,361 to 1,131 farms, or a decrease of 52.1 percent.

Adjustment Assuming Present Size Distribution There are presently 530 farms within the area with cropland acreage above the mini-

Table 9.—Maximum Number of Farms Consistent with $5,000 Return to Operator Labor and Management, Minimum Change and Percentage Change in Farm Numbers from Present Level, Specified Soil Situations, Current Land and Hired Labor Prices, Low Rolling Plains of Southwestern Oklahoma

Soil type	Present level	Programmed minimum requirement per farm	Maximum possible after adjustment	Minimum change in farm numbers
Sandy				
Number of farms	2,684	--	914	—1,770
Cropland	537,548	588	537,432	--
Percent change	--	--	--	66.0
Clay				
Number of farms	2,447	--	902	—1,545
Cropland	780,843	866	781,132	--
Percent change	--	--	--	63.1
Level Loam				
Number of farms	2,361	--	1,131	—1,230
Cropland	605,002	535	605,085	--
Percent change	--	--	--	52.1
Rolling Loam				
Number of farms	1,771	--	221	—1,550
Cropland	365,279	1,652	365,092	--
Percent change	--	--	--	87.5
Area				
Number of farms	9,263	--	3,168	—6,095
Cropland	2,288,672	--	2,288,741	--
Percent change	--	--	--	65.8

mum requirement to yield a $5,000 return to operator labor and management (Table 10). These farms control 494,149 acres of cropland. The distribution of these farms range from none on rolling loam soils to 285 on level loam soils.

If the cropland acreage presently in farms below the minimum requirements to yield a $5,000 income were combined into farms of the minimum size, a maximum of 2,376 farms would be possible on this cropland. The minimum adjustment in farm numbers under the current farm size distribution would be to reduce number of farms from 9,263 to 2,907, a decrease of 6,356 farms or 68.6 percent.

The largest percentage decrease — 87.5 percent — would occur on rolling loam soils, with a reduction from 1,771 to 221 farms. Farms on sandy soils would decrease most in number, 1,808 farms or 67.4 percent. The smallest decrease would occur on level loam soils where farm numbers would be decreased by 1,414 farms, or by 59.9 percent.

Table 10.—Maximum Number of Farms Consistent with $5,000 Return to Operator Labor and Management, Minimum Change and Percentage Change in Farm Numbers from Present Level, Adjusted for Farm Units Currently Above the Minimum Requirement Level, Specified Soil Situations, Low Rolling Plains of Southwestern Oklahoma, Current Land and Hired Labor Prices

Soil Group	Present Level	Programmed minimum requirement per farm	Presently above minimum requirement	Resources to be adjusted	Maximum possible on adjustable resources	Total of all resources after adjustment	Minimum change in farm numbers
Sandy							
Number of farms	2,684	--	90	2,594	786	876	—1,808
Cropland	537,548	588	75,579	461,969	462,168	537,747	--
Percent change	--	--	--	--	--	--	67.4
Clay							
Number of farms	2,447	--	155	2,292	708	863	—1,584
Cropland	780,843	866	167,492	613,351	613,128	780,620	--
Percent change	--	--	--	--	--	--	64.7
Level Loam							
Number of farms	2,361	--	285	2,076	662	947	—1,414
Cropland	605,002	535	251,075	353,927	354,170	605,241	--
Percent change	--	--	--	--	--	--	59.9
Rolling Loam							
Number of farms	1,771	--	0	1,771	221	221	—1,550
Cropland	365,279	1,652	0	365,279	365,092	365,092	--
Percent change	--	--	--	--	--	--	87.5
Area							
Number of farms	9,263	--	530	8,733	2,376	2,907	—6,356
Cropland	2,288,672	--	494,142	1,794,526	1,794,558	2,288,700	--
Percent change	--	--	--	--	--	--	68.6

Adjustment for $7,000 Return

If all the cropland in the area were combined into farming units of the minimum size to obtain a $7,000 return to operator labor and management, a maximum of 2,226 farms would be possible in the area (Table 11). This would be a decrease of 7,037 farms from the present 9,263 farms in the area.

The largest percentage decrease would occur in farms on the rolling loam soils, where a 92.3 percent decrease would be required. The

Table 11.—Maximum Number of Farms Consistent with $7,000 Return to Operator Labor and Management, Minimum Change and Percentage Change in Farm Numbers from Present Level, Specified Soil Situations, Current Land and Hired Labor Prices, Low Rolling Plains of Southwestern Oklahoma

Soil type	Present level	Programmed minimum requirement per farm	Maximum possible after adjustment	Minimum change in farm numbers
Sandy				
Number of farms	2,684	--	654	—2,030
Cropland	537,548	822	537,588	--
Percent change	--	--	--	75.6
Clay				
Number of farms	2,447	--	647	—1,800
Cropland	780,843	1,206	780,282	--
Percent change	--	--	--	73.6
Level Loam				
Number of farms	2,361	--	789	—1,572
Cropland	605,002	767	605,163	--
Percent change	--	--	--	66.6
Rolling Loam				
Number of farms	1,771	--	136	—1,635
Cropland	365,279	2,694	366,384	--
Percent change	--	--	--	92.3
Area				
Number of farms	9,263	--	2,226	—7,037
Cropland	2,288,672	--	2,288,741	--
Percent change	--	--	--	65.8

largest decrease in numbers would occur in farms on sandy soils, where the decrease would be 2,030 farms, or 75.6 percent. The smallest change would be in farms on level loam soils, where the number of farms would have to be decreased by 1,572 farms, or 66.6 percent.

Table 12.—Maximum Number of Farms Consistent with $7,000 Return to Operator Labor and Management, Minimum Change and Percentage Change in Farm Numbers from Present Level, Adjusted for Farm Units Currently Above the Minimum Requirement Level, Specified Soil Situations, Low Rolling Plains of Southwestern Oklahoma, Current Land and Hired Labor Prices

Soil type	Present level	Programmed minimum requirement per farm	Presently above minimum requirement	Resources to be adjusted	Maximum possible on adjustable resources	Total of all resources after adjustment	Minimum change in farm numbers
Sandy							
Number of farms	2,684	--	36	2,648	603	639	—2,045
Cropland	537,548	822	41,692	495,856	495,666	537,358	--
Percent change	--	--	--	--	--	--	76.2
Clay							
Number of farms	2,447	--	42	2,405	593	635	—1,812
Cropland	780,843	1,206	65,748	715,095	715,158	780,906	--
Percent change	--	--	--	--	--	--	74.0
Level Loam							
Number of farms	2,361	--	121	2,240	599	720	—1,641
Cropland	605,002	767	145,200	459,802	459,433	604,633	--
Percent change	--	--	--	--	--	--	69.5
Rolling Loam							
Number of farms	1,771	--	0	1,771	136	136	—1,635
Cropland	365,279	2,694	0	365,279	366,384	366,384	--
Percent change	--	--	--	--	--	--	92.3
Area							
Number of farms	9,263	--	199	9,064	1,931	2,130	—7,133
Cropland	2,288,672	--	252,640	2,036,032	2,036,605	2,289,308	--
Percent change	--	--	--	--	--	--	77.0

Adjustment Assuming Present Size Distribution There are only 199 farms presently in the area which have cropland acreage above the minimum required to obtain a $7,000 return (Table 12). These farms control 252,640 acres of cropland. There are no farms on rolling loam soils above the minimum size to obtain the $7,000 return; on level loam soils there are 121.

If the cropland acreage presently in farms below the minimum acreage requirement is adjusted into farms of the minimum size, a maximum of 1,931 farms is possible. Adding these farms to the 199 farms presently above the minimum size would give a maximum of 2,130 farms for the area with the present farm size distribution. This would be a decrease of 7,133 farms, or 77.0 percent.

The number of farms on rolling loam soils would be decreased by 1,635 or 92.3 percent. Farms on sandy soils would be decreased by 2,045, or 76.2 percent. Farms on level loam soils would be decreased by 1,641 farms, or by 69.5 percent.

Implications for Labor Adjustment

These estimates imply that there are a substantial number of farm operators who are now operating farms with cropland acreage below the minimum required to provide full-time production employment for the operator. The marginal value productivity of operator labor on these farms would be expected to be lower than the marginal value productivity of this labor in nonfarm employment.

The indicated needed adjustment for a $3,000 return is a decrease in farm numbers of 4,760 farms. Assume each of these displaced operators obtains nonfarm employment, working 40 hours per week for 50 weeks each year. The added labor to the nonfarm working force will be 9,520,000 hours per year. From the standpoint of an efficient economy, this much labor is now under-utilized in the agriculture sector of the economy.

Under the same assumptions, a $5,000 return to operator labor and management for all farm operators would require a decrease of 6,356 operators. This could add 12,712,000 hours of labor to the nonfarm work force. For a $7,000 return to operator labor and management, 7,133 operators would be removed from the farms. This could add 14,266,000 hours to the nonfarm labor force.

It is improbable that all of the released labor would be available for nonfarm employment. Some of the labor, especially at the $5,000 and $7,000 income levels, would be needed to meet the hired labor re-

quirements of the farms remaining. Also, it has been assumed that each farm operator with below minimum resources is available for full-time employment. But age, disabilities, and other factors prevent adjustment by some operators. Also, a combination of part-time farming with nonfarm work could provide some farmers with incomes as high as those assumed for this study.

Capital Requirements

High capital requirements may not be a serious deterrent for persons who already have considerable investment in farming. The additional capital necessary to expand and/or operate the farm could probably be obtained. However, the high capital requirements would present a problem to persons with small equities. This would be especially true for a young person contemplating farming as a career.

The weighted average total capital requirement to obtain a $3,000 return to operator labor and management as programmed for this study is $116,697 (Table 13). This total includes $90,068 in land, $10,364 in machinery, and $16,265 in operating capital. The $3,000 operator labor and management return would be 2.57 percent of the total capital requirements.

The average total capital requirement to obtain a $5,000 operator labor and management return in the area would be $193,506. This includes a land investment of $151,667, machinery investment of $14,051, and operating capital of $27,788. The operator labor and management return would be 2.58 percent of the total capital requirement.

A $7,000 return to operator labor and management would require an average total capital of $274,559. This would include a land investment of $216.057, a machinery investment of $17,760, and operating capital of $40,742. The $7,000 return to operator labor and management would be 2.55 percent of the total capital requirement.

Capital requirements in agriculture appear high when compared with the average investment per worker in industry. Estimated investment per worker for selected corporations is shown in Table 14. This investment per worker for these corporations ranged from $40,822 for Standard Oil of New Jersey to $3,679 for the Burroughs Corporation, manufacturer of business machines. Each of these investments per worker is much lower than the $116,696 average investment required to obtain a $3,000 operator labor and management return from farming in the area studied.

The lack of adequate financing may be a serious obstacle to the

Table 13.—Capital Requirements to Obtain Specified Returns to Operator Labor and Management, by Soil Types, Low Rolling Plains of Southwestern Oklahoma, Current Land and Labor Prices

Type of investment	Soil type				Weighted average
	Sandy	Clay	Level loam	Rolling loam	
	— dollars —				
	$3,000 net return to operator labor and management				
Land investment	70,400	73,563	102,358	150,450	90,068
Machinery investment	8,485	12,420	9,170	14,948	10,364
Operating capital	14,205	25,023	9,933	20,469	16,265
Total capital	93,090	111,006	121,461	185,867	116,697
Percent labor & mgmt. return per dollar investment	3.22	2.70	2.47	1.61	2.57
	$5,000 net return to operator labor and management				
Land investment	120,480	116,326	164,244	359,380	151,667
Machinery investment	13,356	15,720	10,420	28,539	14,051
Operating capital	24,690	39,916	16,219	50,239	27,788
Total capital	158,526	171,962	190,883	438,158	193,506
Percent labor & mgmt. return per dollar investment	3.15	2.91	2.62	1.14	2.58
	$7,000 net return to operator labor and management				
Land investment	168,480	162,054	235,594	586,500	216,057
Machinery investment	14,761	18,975	14,315	46,575	17,760
Operating capital	37,538	56,103	23,572	82,969	40,742
Total capital	220,779	237,132	273,481	716,044	274,559
Percent labor & mgmt. return per dollar investment	3.17	2.95	2.56	0.98	2.55

Table 14.—Investment in Plant Equipment and Working Capital per Worker, Selected Industrial Corporations, United States, 1959

Corporation	Type of business	Capital investment per worker[1]
		Dollars
Standard Oil of New Jersey	Integrated international oil and petroleum company	40,822
Burroughs Corp.	Manufacturing of all types of business machines	3,679
Caterpillar Tractor	Manufacturing of heavy tractors and machinery	7,608
Wilson and Company	Meat packing industry	4,193
Consolidated Mines	Lead, zinc, and silver mining in Canada and United States	23,288
General Electric	Manufacturing of electrical appliances and equipment	5,726
National Gypsum	Manufacturing of gypsum building products	17,735
Oklahoma Gas and Electric Company	Electric utility company	30,313

[1]Based on annual reports of stocks, book value of stock per share, and number of employees.

adjustment of all farms to a size necessary to obtain a return comparable to that which could be earned in industry. Most farmers in the area do not own enough land to meet the equity requirements for financing such expansion under present policies of lending agencies.

Presently, many owner-operators are renting additional land. If land is available for rent, this provides a means for immediate adjustment in the size of farm. Consideration should be given to the problem of financing such adjustments.

Summary

The results of this study indicate that over 80 percent of the farms within the area of the study are too small, even with efficient operation, to give a minimum return to operator labor and management of $3,000. If the land area is adjusted into farms of the minimum size to obtain a $3,000 return, the number of farms will be reduced by approximately 50 percent. Further, if the land area is adjusted into farms of the minimum size to obtain a $5,000 return to operator labor and management, which is the average income in nonfarm employment, only about 30 percent of the present number of farms will be possible.

Although some of the displaced farm operators could be employed as hired laborers on the reorganized farms, most of them would require employment in nonfarm work. In most instances, they would require training in nonfarm skills. Also, obtaining nonfarm employment probably will require moving to another area to perform the work.

The findings of this study indicate that farm output may not decrease with a substantial outward adjustment of farm labor if the remaining farms reorganize into larger units.

Based on the interest rates used, it appears that assumed land prices are probably higher than present farm income justifies.

The results presented are normative, rather than predictive, in nature. They reflect the minimum requirements and resource adjustments needed to obtain the specified incomes if the farms are operated in the efficient manner assumed, and if farmers have perfect knowledge. The study is not intended to predict the actual reaction of farmers, nor the actual adjustment pattern farmers will take.

Literature Cited

1. Connor, Larry J., et al., *Resource Requirements, Costs and Expected Returns; Alternative Crop and Livestock Enterprises; Loam Soils of the Rolling Plains of Southwestern Oklahoma,* Okla. Agri. Expt. Sta. Processed Ser. P-368, February 1961.

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

3. Gray, Fenton and H. M. Galloway, *Soils of Oklahoma,* Misc. Pub. MP-56, Okla. Agri. Expt. Sta., July 1959.

4. Lagrone, William F., et al., *Resource Requirements, Costs and Expected Returns; Alternative Crop and Livestock Enterprises; Sandy Soils of the Rolling Plains of Southwestern Oklahoma,* Okla. Agri. Expt. Sta. Processed Ser. P-369, February 1961.

5. U. S. Department of Commerce, Bureau of the Census, *U. S. Census of Agriculture, 1954.*

6. White, C. Mitchell, "Multiple Goals in the Theory of the Firm," *Linear Programming and the Theory of the Firm,* K. E. Boulding and W. A. Spivey, Editors, the MacMillan Company, New York, 1960, Chapter 6.

References

Brewster, J. M. "Analyzing Minimum Resource Requirements for Specified Income Levels," *Farm Size and Output Research,* Southern Cooperative Ser. Bul. 56, June 1958.

_____. *Farm Resources Needed for Specified Income Levels,* Agr. Inform. Bul. 180, U. S. Dept. Agr., December 1957.

Dorfman, Robert. *Application of Linear Programming to the Theory of the Firm,* Univ. of Calif. Press, Berkeley, California, 1951.

_____, P. A. Samuelson, and R. M. Solow. *Linear Programming and Economic Analysis,* McGraw-Hill Book Company, New York.

Heady, E. O. *Economics of Agricultural Production,* Prentice Hall, Inc., New York, 1952.

_____. "Uses and Concepts in Supply Analysis," *Agricultural Supply Function,* Earl O. Heady, et al. (editors), Iowa State Univ. Press, Ames, Iowa, 1961.

_____, and Wilfred Candler. *Linear Programming Methods,* Iowa State College Press, Ames, Iowa, 1959.

_____, H. G. Diesslin, H. R. Jensen, and G. L. Johnson (editors). *Agricultural Adjustment Problems in a Growing Economy,* Iowa State College Press, Ames, Iowa, 1958.

Hicks, J. R. *Value and Capital,* 2d. ed., Oxford University Press, Amen House, London, 1946.

Higgins, Benjamin, "Elements of Indeterminancy in the Theory of Non-Perfect Competition," *American Economic Review,* September 1938.

Leftwich, R. H. *The Price System and Resource Allocations,* Rhinehart and Company, New York, Rev. Ed., 1960, p. 322.

Papandreau, A. G. "Problems in the Theory of the Firm," *A Survey of Contemporary Economics,* Vol. II, Bernard F. Haley (editor), Richard D. Irwin, Inc., Homewood, Illinois, 1952.

Plaxico, J. S., and J. W. Goodwin. "Adjustments for Efficient Organization on Southern Farms," *Summary of Papers Presented at a Seminar for Southern Agricultural Leaders,* Ser. 1, Agricultural Policy Institute, N. C. State College, Raleigh, January 1961.

Swanson, E. R. "Programming Optimal Farm Plans," *Farm Size and Output Research,* Southern Cooperative Ser. Bul. 56, June 1958.

U. S. Bureau of Census. *U. S. Census of Agriculture, 1954.*

_____. *U. S. Census of Agriculture, 1959.*

APPENDIX TABLES

Appendix A, Table 1
Assumed Current (1961) Prices Received by Farmers, Low Rolling Plains of Southwestern Oklahoma

Item	Unit	Price
		Dollars
Cotton, line (SLM 15/16 light spot)	Cwt.	28.00[1]
Cotton seed	Ton	50.00
Wheat	Bu.	1.70[1]
Grain sorghum	Cwt.	1.79[1]
Oats	Bu.	.60[1]
Alfalfa seed	Cwt.	21.00
Alfalfa hay	Ton	20.00[2]
Small grain hay	Ton	20.00
Forage sorghum	Ton	20.00
Beef	Cwt.	--[3]

[1]These prices are the 1961 support price adjusted for grade and storage differential.
[2]Estimated price of alfalfa hay sold in the field immediately after baling.
[3]See Appendix A, Table 2.

Appendix A, Table 2
Assumed[1] Prices for Stocker and Feeder Steers, and Cull Cows by Months, Low Rolling Plains of Southwestern Oklahoma

Class and grade	Monthly average												Yearly
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	average
	— price per cwt. —												
Slaughter calves													
Prime and choice													
500 lbs. and less	$22.25	$22.75	$23.00	$23.75	$24.00	$23.00	$22.50	$21.75	$21.00	$20.50	$21.00	$21.50	$22.25
Good and commercial													
500 lbs.	19.50	20.00	20.25	20.75	20.75	19.25	19.25	18.75	18.25	17.50	17.75	18.50	19.25
Slaughter bulls													
Commercial, all weights	17.75	18.00	18.50	18.50	18.50	17.75	17.75	16.75	16.50	16.25	15.50	16.75	17.25
Utility and cutter, all weights	15.25	15.50	16.25	16.25	16.25	15.00	15.00	14.00	14.00	13.75	13.75	14.50	15.00
Slaughter cows													
Utility, all weights	14.00	14.50	15.00	15.00	15.00	14.25	14.00	13.50	13.50	13.00	13.25	13.25	14.00
Canners and cutters, all weights	11.75	12.25	12.50	12.50	12.25	11.25	11.00	11.00	10.75	10.25	10.25	10.75	11.25
Stocker and feeder steers													
Choice and good													
500 lbs. and less	23.25	24.50	25.00	25.25	24.50	23.50	23.00	23.25	23.00	22.50	22.50	22.50	23.50
Good													
500-800 lbs.	21.50	22.25	22.25	22.25	22.75	21.50	21.00	20.75	20.50	20.00	20.25	20.50	21.25
800-1050 lbs.	20.75	21.50	21.75	22.25	22.00	21.00	20.75	20.75	20.25	19.75	20.00	20.25	21.00
Medium													
500-1000 lbs.	18.25	19.00	19.00	19.25	19.50	18.25	18.00	17.75	17.50	16.75	17.50	17.25	18.25
Common													
500-900 lbs.	15.00	16.25	16.25	16.25	16.25	14.75	14.75	14.50	13.75	13.75	14.00	14.25	15.00

[1]The seasonal pattern as well as the class and grade differentials are based on data from James S. Plaxico and Jackson L. James, **Beef Cattle Prices; Seasonal Movements and Price Differentials on the Oklahoma City Market,** Oklahoma Agricultural Experiment Station Bulletin B-486, February 1957.

Appendix A, Table 3
Assumed Current (1961) Prices Paid by Farmers, Low Rolling Plains of Southwestern Oklahoma

Item	Unit	Price
		Dollars
Seed and feed		
Seed wheat	Bu.	$ 1.60
Seed cotton	Cwt.	8.00
Seed oats	Bu.	1.10
Sudan, sweet	Cwt.	6.00
Grain sorghum	Cwt.	7.00
Alfalfa seed	Cwt.	50.00
Forage sorghum	Cwt.	7.00
Native grass seed	Cwt.	60.00
Rye	Bu.	1.25
Cotton seed cake	Ton	76.00
Fertilizer		
10-20-10	Ton	105.00
13-39-0	Ton	105.00
16-20-0	Ton	89.00
8-32-16	Ton	106.00
6-46-0	Ton	79.00
Custom rates		
Combining wheat and oats	Acre	3.00
Cotton stripping	Cwt. seed cotton	.75
Cotton snapping	Cwt. seed cotton	2.00
Hauling		
Cotton	Cwt. seed cotton	0.25
Wheat	Bu	.07
Grain sorghum	Cwt.	.10
Hay	Ton	2.40
Cotton defoliation	Acre	2.00
Cotton insecticide spraying	Acre	3.50
Cotton hoeing	Acre	2.50
Cotton ginning and wrapping	Cwt. seed cotton	.85
Cotton pre-emerge chemical	Acre	2.50
Hay baling	Ton	4.80

Appendix A, Table 3 (Continued)

Item	Unit	Price
		Dollars
Fuel and lubricant		
Gasoline	Gal.	.20
LP gas	Gal.	.09
Diesel oil	Gal.	.16
Kerosene	Gal.	.15
Motor oil	Gal.	1.00
Lubricant	Lb.	.20
Land		
Clay soil	Acre	105.00
Level loam soil	Acre	240.00
Rolling loam soil	Acre	170.00
Sandy soil	Acre	160.00
Hired labor	Hour	1.00

Appendix B, Table 1
Estimated Minimum Requirements for $3,000 Return to Operator Labor and Management, Clay Soils, Low Rolling Plains of Southwestern Oklahoma, Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$78.75	$105.00[1]	$131.25	$157.50
Hired labor at $1.00[1] per hour					
Total land	Acre	580	701	825	1,896
Cropland	Acre	453	546	644	1,481
Cotton	Acre	54	65	77	178
Wheat	Acre	218	262	309	711
Oats	Acre	19	23	27	65
Small grain hay	Acre	62	75	89	203
Sudan grazing	Acre	62	75	87	166
Small grain grazing	Acre	25	30	36	83
Blue panic-sudan	Acre	0	0	0	33
Fallow	Acre	13	16	19	42
Stocker-calves	Animal	126	152	178	410
Operator labor	Hour	1,204	1,269	1,322	1,637
Hired labor	Hour	223	353	486	2,323
Investment					
Land and buildings	Dollar	45,675	73,563	108,281	298,620
Machinery	Dollar	12,420	12,420	12,420	21,804

CONTINUED

Appendix B, Table 1 (Continued)

Item	Unit	Land price per acre			
		$78.75	$105.00[1]	$131.25	$157.50
Operating capital[2]	Dollar	20,658	25,023	29,510	69,378
Total capital requirement	Dollar	78,753	111,006	150,211	389,802
Gross receipts	Dollar	13,255	15,998	18,794	43,267
Operating and overhead expense	Dollar	6,478	7,679	8,916	22,760
Return to land[3]	Dollar	2,284	3,678	5,414	14,931
Machinery interest and depreciation[4]	Dollar	1,466	1,466	1,466	2,573
Return to operator labor and management	Dollar	3,027	3,175	2,998	3,003
See footnotes at end of table.					
Hired labor at $1.50 per hour					
Total land	Acre	598	733	942	
Cropland	Acre	467	573	736	
Cotton	Acre	56	69	88	
Wheat	Acre	224	275	353	
Oats	Acre	20	24	31	
Small grain hay	Acre	65	79	101	
Sudan grazing	Acre	63	78	100	
Small grain grazing	Acre	26	32	41	
Blue panic-sudan	Acre	0	0	0	
Fallow	Acre	13	16	22	
Stocker-calves	Animal	130	158	204	
Operator labor	Hour	1,210	1,280	1,386	
Hired labor	Hour	241	387	613	
Investment					
Land and buildings	Dollar	47,093	76,965	123,637	
Machinery	Dollar	12,420	12,420	12,420	
Operating capital[2]	Dollar	21,386	26,393	34,183	
Total capital requirement	Dollar	80,899	115,778	170,240	
Gross receipts	Dollar	13,659	16,692	21,494	
Operating and overhead expense	Dollar	6,671	8,217	10,831	
Return to land[3]	Dollar	2,355	3,848	6,182	
Machinery interest and depreciation[4]	Dollar	1,466	1,466	1,466	
Return to operator labor and management	Dollar	3,167	3,161	3,015	
See footnotes at end of table.					
Hired labor at $2.00 per hour					
Total land	Acre	617	772	1,264	
Cropland	Acre	482	603	987	
Cotton	Acre	58	72	118	
Wheat	Acre	231	290	474	
Oats	Acre	21	25	42	
Small grain hay	Acre	66	82	136	

No Solution

Appendix B, Table 1 (Continued)

Item	Unit	Land price per acre $78.75	$105.00[1]	$131.25	$157.50
Sudan grazing	Acre	66	83	132	
Small grain grazing	Acre	26	33	55	
Blue panic-sudan	Acre	0	0	2	
Fallow	Acre	14	18	28	
Stocker-calves	Animal	134	167	273	
Operator labor	Hour	1,220	1,292	1,547	
Hired labor	Hour	263	430	977	
Investment					No Solution
Land and buildings	Dollar	48,589	81,060	165,900	
Machinery	Dollar	12,420	12,420	12,420	
Operating capital[2]	Dollar	22,243	28,063	46,739	
Total capital requirement	Dollar	83,252	121,543	225,059	
Gross receipts	Dollar	14,092	17,598	28,798	
Operating and overhead expense	Dollar	7,029	8,887	15,876	
Return to land[3]	Dolar	2,429	4,053	8,295	
Machinery interest and depreciation[4]	Dollar	1,466	1,466	1,466	
Return to operator labor and management	Dollar	3,168	3,192	3,161	

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 2
Estimated Minimum Requirements for $5,000 Return to Operator Labor and Management, Clay Soils, Low Rolling Plains of Southwestern Oklahoma, Specified Land and Hired Labor Prices

Item	Unit	Land price per acre $78.75	$105.00[1]	$131.25	$157.50
Hired labor at $1.00[1] per hour					
Total land	Acre	915	1,108	1,668	4,652
Cropland	Acre	715	866	1,303	3,634
Cotton	Acre	86	103	156	436
Wheat	Acre	343	415	626	1,744
Oats	Acre	30	37	57	159
Small grain hay	Acre	99	119	180	500
Sudan grazing	Acre	97	118	146	407

CONTINUED

Appendix B, Table 2 (Continued)

Item	Unit	Land price per acre			
		$78.75	$105.00[1]	$131.25	$157.50
Small grain grazing	Acre	40	48	72	202
Blue panic-sudan	Acre	0	0	29	82
Fallow	Acre	20	26	37	104
Stocker-calves	Animal	198	240	361	1,006
Operator labor	Hour	1,372	1,482	1,610	1,734
Hired labor	Hour	584	853	1,874	7,981
Investment					
Land and buildings	Dollar	72,056	116,326	218,925	732,690
Machinery	Dollar	15,720	15,720	19,182	53,498
Operating capital[2]	Dollar	32,870	39,916	60,789	172,303
Total capital requirement	Dollar	120,646	171,962	298,896	958,491
Gross receipts	Dollar	20,889	25,257	38,079	106,136
Operating and overhead expense	Dollar	10,217	12,345	19,854	58,185
Return to land[3]	Dollar	3,603	5,816	10,946	36,635
Machinery interest and depreciation[4]	Dollar	1,855	1,855	2,263	6,313
Return to operator labor and management	Dollar	5,214	5,241	5,016	5,003
See footnotes at end of table.					
Hired labor at $1.50 per hour					
Total land	Acre	959	1,193	2,538	
Cropland	Acre	750	932	1,983	
Cotton	Acre	90	112	238	
Wheat	Acre	360	447	952	
Oats	Acre	32	40	87	
Small grain hay	Acre	103	128	273	
Sudan grazing	Acre	102	127	222	
Small grain grazing	Acre	42	51	110	
Blue panic-sudan	Acre	0	0	45	
Fallow	Acre	21	27	56	
Stocker-calves	Animal	204	258	549	
Operator labor	Hour	1,396	1,505	1,714	
Hired labor	Hour	631	988	3,587	
Investment					
Land and buildings	Dollar	75,521	125,265	333,113	
Machinery	Dollar	15,720	15,720	29,187	
Operating capital[2]	Dollar	34,776	43,531	94,981	
Total capital requirement	Dollar	126,017	184,516	457,281	
Gross receipts	Dollar	21,906	27,208	57,917	
Operating and overhead expense	Dollar	11,003	13,770	32,810	
Return to land[3]	Dollar	3,776	6,263	16,656	
Machinery interest and depreciation[4]	Dollar	1,855	1,855	3,444	
Return to operator labor and management	Dollar	5,272	5,320	5,007	
See footnotes at end of table.					

No Solution

Appendix B, Table 2 (Continued)

Item	Unit	Land price per acre			
		$78.75	$105.00[1]	$131.25	$157.50
Hired labor at $2.00 per hour					
Total land	Acre	1,014	1,311		
Cropland	Acre	792	1,024		
Cotton	Acre	95	123		
Wheat	Acre	380	491		
Oats	Acre	33	45		
Small grain hay	Acre	109	141		
Sudan grazing	Acre	108	117		
Small grain grazing	Acre	44	57		
Blue panic-sudan	Acre	0	21		
Fallow	Acre	23	29		
Stocker-calves	Animal	220	282	No Solution	No Solution
Operator labor	Hour	1,423	1,658		
Hired labor	Hour	704	1,173		
Investment					
Land and buildings	Dollar	79,853	137,655		
Machinery	Dollar	15,720	15,720		
Operating capital[2]	Dollar	37,153	48,625		
Total capital requirement	Dollar	132,726	202,000		
Gross receipts	Dollar	23,117	29,897		
Operating and overhead expense	Dollar	12,004	15,818		
Return to land[3]	Dollar	3,993	6,883		
Machinery interest and depreciation[4]	Dollar	1,855	1,855		
Return to operator labor and management	Dollar	5,265	5,341		

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 3
Estimated Minimum Requirements for $7,000 Return to Operator Labor and Management, Clay Soils, Low Rolling Plains of Southwestern Oklahoma, Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$78.75	$105.00[1]	$131.25	$157.50
Hired labor at $1.00[1] per hour					
Total land	Acre	1,259	1,543	2,610	7,552
Cropland	Acre	983	1,206	2,039	5,900
Cotton	Acre	118	144	245	708
Wheat	Acre	472	578	979	2,832
Oats	Acre	42	53	89	258
Small grain hay	Acre	135	166	281	811
Sudan grazing	Acre	133	135	228	661
Small grain grazing	Acre	54	67	113	328
Blue panic-sudan	Acre	0	27	46	133
Fallow	Acre	29	36	58	169
Stocker-calves	Animal	272	334	564	1,633
Operator labor	Hour	1,559	1,595	1,723	1,734
Hired labor	Hour	1,094	1,628	3,728	16,039
Investment					
Land and buildings	Dollar	99,146	162,054	342,563	1,189,440
Machinery	Dollar	18,975	18,975	30,015	86,848
Operating capital[2]	Dollar	45,489	56,103	95,780	280,552
Total capital requirement	Dollar	163,610	237,132	468,358	1,556,840
Gross receipts	Dollar	28,686	35,247	59,543	153,150
Operating and overhead expense	Dollar	14,228	17,674	31,871	76,425
Return to land[3]	Dollar	4,957	8,103	17,128	59,472
Machinery interest and depreciation[4]	Dollar	2,239	2,239	3,542	10,248
Return to operator labor and management	Dollar	7,262	7,231	7,002	7,005
Hired labor at $1.50 per hour					
Total land	Acre	1,351	1,726	4,670	
Cropland	Acre	1,055	1,348	3,648	
Cotton	Acre	127	162	438	
Wheat	Acre	507	647	1,751	
Oats	Acre	46	59	159	
Small grain hay	Acre	144	186	502	
Sudan grazing	Acre	118	151	409	
Small grain grazing	Acre	59	75	203	
Blue panic-sudan	Acre	24	30	82	
Fallow	Acre	30	38	104	
Stocker-calves	Animal	293	373	1,010	
Operator labor	Hour	1,571	1,617	1,734	
Hired labor	Hour	1,251	1,989	8,021	

No Solution

See footnotes at end of table.

Appendix B, Table 3 (Continued)

Item	Unit	Land price per acre $78.75	$105.00[1]	$131.25	$157.50
Investment					
Land and buildings	Dollar	106,391	181,230	612,938	
Machinery	Dollar	18,975	18,975	53,705	
Operating capital[2]	Dollar	49,577	63,904	176,865	
Total capital requirement	Dollar	174,943	264,109	843,508	
Gross receipts	Dollar	30,858	39,368	106,555	
Operating and overhead expense	Dollar	15,906	20,620	62,554	
Return to land[3]	Dollar	5,320	9,062	30,647	
Machinery interest and depreciation[4]	Dollar	2,239	2,239	6,337	
Return to operator labor and management	Dollar	7,393	7,447	7,017	
Hired labor at $2.00 per hour					
Total land	Acre	1,484	2,012		
Cropland	Acre	1,159	1,572		
Cotton	Acre	139	188		
Wheat	Acre	556	755		
Oats	Acre	51	69		
Small grain hay	Acre	160	216		
Sudan grazing	Acre	130	176		
Small grain grazing	Acre	64	87		
Blue panic-sudan	Acre	26	36		
Fallow	Acre	33	45		
Stocker-calves	Animal	321	435		
Operator labor	Hour	1,588	1,651	No Solution	No Solution
Hired labor	Hour	1,512	2,552		
Investment					
Land and buildings	Dollar	116,855	211,260		
Machinery	Dollar	18,975	18,975		
Operating capital[2]	Dollar	55,413	72,125		
Total capital requirement	Dollar	191,243	302,360		
Gross receipts	Dollar	33,871	45,916		
Operating and overhead expense	Dollar	18,365	25,713		
Return to land[3]	Dollar	5,843	10,563		
Machinery interest and depreciation[4]	Dollar	2,239	2,239		
Return to operator labor and management	Dollar	7,424	7,401		

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 4

Estimated Minimum Requirements for $3,000 Return to Operator Labor and Management for Level Loam Soils, Low Rolling Plains of Southwestern Oklahoma, Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$180	$240[1]	$300	$360
Hired labor at $1.00[1] per hour					
Total land	Acre	326	426	567	
Cropland	Acre	255	334	443	
Cotton	Acre	51	67	88	
Wheat	Acre	74	97	129	
Alfalfa	Acre	58	76	100	
Grain sorghum	Acre	54	70	94	
Small grain hay	Acre	7	9	12	
Small grain grazing	Acre	11	15	20	
Reseeded cropland	Acre	--	--	--	
Cows	Animal	3	4	6	
Stocker-calves	Animal	28	36	48	
Operator labor	Hour	1,331	1,339	1,457	
Hired labor	Hour	0	213	390	
Investment					
Land and buildings	Dollar	58,680	102,358	170,100	
Machinery	Dollar	9,170	9,170	9,170	
Operating capital[2]	Dollar	7,471	9,933	13,413	
Total capital requirement	Dollar	75,321	121,461	192,683	
Gross receipts	Dollar	11,071	14,484	19,274	
Operating and overhead expense	Dollar	3,965	5,131	6,687	
Return to land[3]	Dollar	2,934	5,118	8,505	
Machinery interest and depreciation[4]	Dollar	1,082	1,082	1,082	
Return to operator labor and management	Dollar	3,090	3,153	3,000	
Hired labor at $1.50 per hour					
Total land	Acre	326	430	612	
Cropland	Acre	255	336	478	
Cotton	Acre	51	67	96	
Wheat	Acre	74	97	139	
Alfalfa	Acre	58	76	108	
Grain sorghum	Acre	54	71	101	
Small grain hay	Acre	7	9	13	
Small grain grazing	Acre	11	16	21	
Reseeded cropland	Acre	--	--	--	
Cows	Animal	3	4	7	
Stocker-calves	Animal	28	37	52	
Operator labor	Hour	1,331	1,334	1,490	
Hired labor	Hour	0	222	456	

No Solution

No Solution

See footnotes at end of table.

Appendix B, Table 4 (Continued)

Item	Unit	Land price per acre $180	$240[1]	$300	$360
Investment					
Land and buildings	Dollar	58,680	103,200	183,600	
Machinery	Dollar	9,170	9,170	9,170	
Operating capital[2]	Dollar	7,471	10,328	14,878	
Total capital requirement	Dollar	75,321	122,698	207,648	
Gross receipts	Dollar	11,071	14,609	20,836	
Operating and overhead expense	Dollar	3,965	5,243	7,547	
Return to land[3]	Dollar	2,934	5,160	9,180	
Machinery interest and depreciation[4]	Dollar	1,082	1,082	1,082	
Return to operator labor and management	Dollar	3,090	3,124	3,027	
Hired labor at $2.00 per hour					
Total land	Acre	326	435	634	
Cropland	Acre	255	340	534	
Cotton	Acre	51	68	107	
Wheat	Acre	74	99	155	
Alfalfa	Acre	58	76	121	No Solution
Grain sorghum	Acre	54	72	112	
Small grain hay	Acre	7	9	14	
Small grain grazing	Acre	11	16	25	
Reseeded cropland	Acre	--	--	--	
Cows	Animal	3	5	7	
Stocker-calves	Animal	28	37	58	
Operator labor	Hour	1,331	1,351	1,554	
Hired labor	Hour	0	232	545	
Investment					
Land and buildings	Dollar	58,680	104,400	205,200	
Machinery	Dollar	9,170	9,170	9,234	
Operating capital[2]	Dollar	7,471	10,465	16,766	
Total capital requirement	Dollar	75,321	124,035	231,200	
Gross receipts	Dollar	11,071	14,793	23,230	
Operating and overhead expense	Dollar	3,965	5,360	8,870	
Return to land[3]	Dollar	2,934	5,220	10,260	
Machinery interest and depreciation[4]	Dollar	1,032	1,032	1,090	
Return to operator labor and management	Dollar	3,090	3,131	3,010	

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 5

Estimated Minimum Requirements for $5,000 Return to Operator Labor and Management, Level Loam Soils, Low Rolling Plains of Southwestern Oklahoma, for Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$180	$240[1]	$300	$360
Hired labor at $1.00[1] per hour					
Total land	Acre	514	684	1,179	
Cropland	Acre	401	535	921	
Cotton	Acre	80	107	184	
Wheat	Acre	117	155	267	
Alfalfa	Acre	91	121	209	
Grain sorghum	Acre	85	113	195	
Small grain hay	Acre	10	14	24	
Small grain grazing	Acre	18	25	42	
Reseeded cropland	Acre	--	--	--	
Cows	Animal	5	7	12	
Stocker-calves	Animal	44	58	101	
Operator labor	Hour	1,483	1,557	1,714	No Solution
Hired labor	Hour	178	546	1,434	
Investment					
Land and buildings	Dollar	92,520	164,244	353,700	
Machinery	Dollar	10,420	10,420	15,916	
Operating capital[2]	Dollar	11,984	16,219	28,627	
Total capital requirement	Dollar	114,924	190,883	398,243	
Gross receipts	Dollar	17,453	23,260	40,070	
Operating and overhead expense	Dollar	6,576	8,698	15,496	
Return to land[3]	Dollar	4,626	8,212	17,685	
Machinery interest and depreciation[4]	Dollar	1,230	1,230	1,878	
Return to operator labor and management	Dollar	5,021	5,120	5,011	
Hired labor at $1.50 per hour					
Total land	Acre	522	710	1,560	
Cropland	Acre	408	555	1,219	
Cotton	Acre	82	111	243	
Wheat	Acre	118	161	353	
Alfalfa	Acre	92	126	277	
Grain sorghum	Acre	86	117	258	
Small grain hay	Acre	11	15	32	
Small grain grazing	Acre	19	25	56	
Reseeded cropland	Acre	--	--	--	No Solution
Cows	Animal	6	7	16	
Stocker-calves	Animal	44	60	133	
Operator labor	Hour	1,498	1,573	1,714	
Hired labor	Hour	188	583	2,257	

See footnotes at end of table.

Appendix B, Table 5 (Continued)

Item	Unit	Land price per acre			
		$180	$240[1]	$300	$360
Investment					
Land and buildings	Dollar	93,960	170,400	468,000	
Machinery	Dollar	10,420	10,420	21,060	
Operating capital[2]	Dollar	12,281	17,851	39,324	
Total capital requirement	Dollar	116,661	198,671	528,384	
Gross receipts	Dollar	17,744	24,134	53,036	
Operating and overhead expense	Dollar	6,650	9,243	22,107	
Return to land[3]	Dollar	4,698	8,520	23,400	
Machinery interest and depreciation[4]	Dollar	1,230	1,230	2,485	
Return to operator labor and management	Dollar	5,166	5,141	5,044	
Hired labor at $2.00 per hour					
Total land	Acre	532	739	8,640	
Cropland	Acre	416	577	6,750	
Cotton	Acre	83	115	1,350	
Wheat	Acre	121	167	1,957	
Alfalfa	Acre	94	131	1,530	
Grain sorghum	Acre	88	122	1,424	
Small grain hay	Acre	12	15	179	
Small grain grazing	Acre	18	27	310	
Reseeded cropland	Acre	--	--	--	
Cows	Animal	6	7	90	
Stocker-calves	Animal	45	63	736	
Operator labor	Hour	1,514	1,592	1,714	No Solution
Hired labor	Hour	203	611	19,068	
Investment					
Land and buildings	Dollar	95,760	177,360	2,592,000	
Machinery	Dollar	10,420	10,420	116,640	
Operating capital[2]	Dollar	12,655	18,242	237,493	
Total capital requirement	Dollar	118,835	206,022	2,946,133	
Gross receipts	Dollar	18,105	25,099	293,656	
Operating and overhead expense	Dollar	6,870	9,757	145,235	
Return to land[3]	Dollar	4,788	8,868	129,600	
Machinery interest and depreciation[4]	Dollar	1,230	1,230	13,764	
Return to operator labor and management	Dollar	5,217	5,244	5,057	

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 6

Estimated Minimum Requirements for $7,000 Return to Operator Labor and Management, Level Loam Soils, Low Rolling Plains of Southwestern Oklahoma, for Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$180	$240[1]	$300	$360
Hired labor at $1.00[1] per hour					
Total land	Acre	734	982	1,929	
Cropland	Acre	574	767	1,507	
Cotton	Acre	115	153	301	
Wheat	Acre	166	222	437	
Alfalfa	Acre	130	175	341	
Grain sorghum	Acre	121	162	319	
Small grain hay	Acre	15	20	40	
Small grain grazing	Acre	27	35	69	
Reseeded cropland	Acre	--	--	--	
Cows	Animal	8	10	20	
Stocker-calves	Animal	62	83	164	
Operator labor	Hour	1,667	1,703	1,714	No Solution
Hired labor	Hour	463	1,136	3,049	
Investment					
Land and buildings	Dollar	132,120	235,594	578,700	
Machinery	Dollar	14,315	14,315	26,042	
Operating capital[2]	Dollar	17,366	23,572	47,466	
Total capital requirement	Dollar	163,801	273,481	652,208	
Gross receipts	Dollar	24,946	33,363	65,547	
Operating and overhead expense	Dollar	9,657	12,778	26,525	
Return to land[3]	Dollar	6,606	11,780	28,935	
Machinery interest depreciation[4]	Dollar	1,639	1,689	3,073	
Return to operator labor and management	Dollar	6,994	7,116	7,014	
Hired labor at $1.50 per hour					
Total land	Acre	756	1,040	2,925	
Cropland	Acre	591	813	2,285	
Cotton	Acre	118	162	457	
Wheat	Acre	171	236	663	
Alfalfa	Acre	134	184	518	
Grain sorghum	Acre	125	171	482	
Small grain hay	Acre	16	22	60	
Small grain grazing	Acre	27	38	105	
Reseeded cropland	Acre	--	--	--	
Cows	Animal	8	11	31	
Stocker-calves	Animal	64	88	249	
Operator labor	Hour	1,686	1,714	1,714	
Hired labor	Hour	491	1,148	5,319	

See footnotes at end of table.

Appendix B, Table 6 (Continued)

Item	Unit	Land price per acre $180	$240[1]	$300	$360
Investment					
Land and buildings	Dollar	136,080	249,600	877,500	
Machinery	Dollar	14,315	14,315	39,487	
Operating capital[2]	Dollar	18,140	27,056	75,543	
Total capital requirement	Dollar	168,535	290,971	992,535	
Gross receipts	Dollar	25,703	35,340	99,423	No Solution
Operating and overhead expense	Dollar	9,961	13,927	43,845	
Return to land[3]	Dollar	6,804	12,480	43,875	
Machinery interest and depreciation[4]	Dollar	1,639	1,639	4,659	
Return to operator labor and management	Dollar	7,249	7,244	7,044	
Hired labor at $2.00 per hour					
Total land	Acre	781	1,117	27,785	
Cropland	Acre	610	873	21,706	
Cotton	Acre	122	174	4,340	
Wheat	Acre	177	253	6,293	
Alfalfa	Acre	138	198	4,921	
Grain sorghum	Acre	129	184	4,580	
Small grain hay	Acre	16	23	574	
Small grain grazing	Acre	28	41	998	
Reseeded cropland	Acre	--	--	--	
Cows	Animal	8	12	290	
Stocker-calves	Animal	67	95	2,363	
Operator labor	Hour	1,711	1,714	1,714	No Solution
Hired labor	Hour	523	1,311	65,117	
Investment					
Land and buildings	Dollar	140,580	268,080	8,335,500	
Machinery	Dollar	14,315	14,315	375,097	
Operating capital[2]	Dollar	19,012	28,349	770,844	
Total capital requirement	Dollar	173,907	310,744	9,481,441	
Gross receipts	Dollar	26,525	38,003	994,298	
Operating and overhead expense	Dollar	10,591	15,660	526,066	
Return to land[3]	Dollar	7,029	13,404	416,775	
Machinery interest and depreciation[4]	Dollar	1,689	1,689	44,261	
Return to operator labor and management	Dollar	7,216	7,250	7,196	

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 7

Estimated Minimum Requirements for $3,000 Return to Operator Labor and Management, Rolling Loam Soils, Low Rolling Plains of Southwestern Oklahoma, for Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$127.50	$170.00[1]	$212.50	$255.00
Hired labor at $1.00[1] per hour					
Total land	Acre	617	885		
Cropland	Acre	483	691		
Cotton	Acre	91	131		
Wheat	Acre	164	235		
Alfalfa	Acre	46	66		
Grain sorghum	Acre	86	122		
Small grain hay	Acre	20	28		
Small grain grazing	Acre	18	26		
Reseeded cropland	Acre	53	83		
Cows	Animal	11	16		
Stocker-calves	Animal	46	66		
Operator labor	Hour	1,482	1,625		
Hired labor	Hour	187	530		
Investment				No Solution	No Solution
Land and buildings	Dollar	78,668	150,450		
Machinery	Dollar	14,315	14,948		
Operating capital[2]	Dollar	14,111	20,469		
Total capital requirement	Dollar	107,094	185,867		
Gross receipts	Dollar	16,061	23,000		
Operating and overhead expense	Dollar	7,404	10,757		
Return to land[3]	Dollar	3,933	7,523		
Machinery interest and depreciation[4]	Dollar	1,689	1,764		
Return to operator labor and management	Dollar	3,035	2,956		
Hired labor at $1.50 per hour					
Total land	Acre	631	1,185		
Cropland	Acre	492	925		
Cotton	Acre	93	176		
Wheat	Acre	167	314		
Alfalfa	Acre	47	88		
Grain sorghum	Acre	98	163		
Small grain hay	Acre	11	38		
Small grain grazing	Acre	17	35		
Reseeded cropland	Acre	59	111		
Cows	Animal	11	21	No Solution	No Solution
Stocker-calves	Animal	45	87		
Operator labor	Hour	1,498	1,681		
Hired labor	Hour	188	1,018		

See footnotes at end of table.

Appendix B, Table 7 (Continued)

Item	Unit	Land price per acre			
		$127.50	$170.00[1]	$212.50	$255.00
Investment					
Land and buildings	Dollar	80,452	201,450		
Machinery	Dollar	14,315	15,998		
Operating capital[2]	Dollar	14,103	28,210		
Total capital requirement	Dollar	108,870	245,658		
Gross receipts	Dollar	16,322	30,778		
Operating and overhead expense	Dollar	7,580	15,805		
Return to land[3]	Dollar	4,023	10,073		
Machinery interest and depreciation[4]	Dollar	1,689	1,888		
Return to operator labor and management	Dollar	3,030	3,012		
Hired labor at $2.00 per hour					
Total land	Acre	646			
Cropland	Acre	505			
Cotton	Acre	95			
Wheat	Acre	172			
Alfalfa	Acre	48			
Grain sorghum	Acre	100			
Small grain hay	Acre	11			
Small grain grazing	Acre	18			
Reseeded cropland	Acre	61			
Cows	Animal	12			
Stocker-calves	Animal	46			
Operator labor	Hour	1,511			
Hired labor	Hour	195			
Investment			No Solution	No Solution	No Solution
Land and buildings	Dollar	82,365			
Machinery	Dollar	14,315			
Operating capital[2]	Dollar	14,546			
Total capital requirement	Dollar	111,226			
Gross receipts	Dollar	16,709			
Operating and overhead expense	Dollar	7,872			
Return to land[3]	Dollar	4,118			
Machinery interest and depreciation[4]	Dollar	1,689			
Return to operator labor and management	Dollar	3,030			

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 8

Estimated Minimum Requirements for $5,000 Return to Operator Labor and Management, Rolling Loam Soils, Low Rolling Plains of Southwestern Oklahoma, for Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$127.50	$170.00[1]	$212.50	$255.00
Hired labor at $1.00[1] per hour					
Total land	Acre	948	2,114		
Cropland	Acre	740	1,652		
Cotton	Acre	140	314		
Wheat	Acre	251	562		
Alfalfa	Acre	71	157		
Grain sorghum	Acre	131	291		
Small grain hay	Acre	30	68		
Small grain grazing	Acre	28	62		
Reseeded cropland	Acre	89	198		
Cows	Animal	17	38		
Stocker-calves	Animal	70	156		
Operator labor	Hour	1,636	1,714	No Solution	No Solution
Hired labor	Hour	632	2,695		
Investment					
Land and buildings	Dollar	120,870	359,380		
Machinery	Dollar	15,720	28,539		
Operating capital[2]	Dollar	21,979	50,239		
Total capital requirement	Dollar	158,569	438,158		
Gross receipts	Dollar	24,621	54,845		
Operating and overhead expense	Dollar	11,685	28,487		
Return to land[3]	Dollar	6,044	17,969		
Machinery interest and depreciation[4]	Dollar	1,855	3,368		
Return to operator labor and management	Dollar	5,037	5,021		
Hired labor at $1.50 per hour					
Total land	Acre	1,003	5,340		
Cropland	Acre	782	4,171		
Cotton	Acre	149	792		
Wheat	Acre	266	1,418		
Alfalfa	Acre	74	396		
Grain sorghum	Acre	138	824		
Small grain hay	Acre	32	91		
Small grain grazing	Acre	29	149		
Reseeded cropland	Acre	94	501		
Cows	Animal	18	96	No Solution	No Solution
Stocker-calves	Animal	75	372		
Operator labor	Hour	1,646	1,714		
Hired labor	Hour	722	9,288		

See footnotes at end of table.

Appendix B, Table 8 (Continued)

Item	Unit	Land price per acre			
		$127.50	$170.00[1]	$212.50	$255.00
Investment					
Land and buildings	Dollar	127,882	907,800		
Machinery	Dollar	15,720	72,090		
Operating capital[2]	Dollar	23,125	130,265		
Total capital requirement	Dollar	166,727	1,110,155		
Gross receipts	Dollar	26,055	137,631		
Operating and overhead expense	Dollar	12,772	78,703		
Return to land[3]	Dollar	6,394	45,390		
Machinery interest and depreciation[4]	Dollar	1,855	8,507		
Return to operator labor and management	Dollar	5,034	5,031		
Hired labor at $2.00 per hour					
Total land	Acre	1,077			
Cropland	Acres	842			
Cotton	Acre	160			
Wheat	Acre	286			
Alfalfa	Acre	80			
Grain sorghum	Acre	149			
Small grain hay	Acre	35			
Small grain grazing	Acre	31			
Reseeded cropland	Acre	101			
Cows	Animal	19			
Stocker-calves	Animal	80			
Operator labor	Hour	1,660	No Solution	No Solution	No Solution
Hired labor	Hour	837			
Investment					
Land and buildings	Dollar	137,318			
Machinery	Dollar	15,720			
Operating capital[2]	Dollar	25,923			
Total capital requirement	Dollar	178,961			
Gross receipts	Dollar	27,964			
Operating and overhead expense	Dollar	14,212			
Return to land[3]	Dollar	6,866			
Machinery interest and depreciation[4]	Dollar	1,855			
Return to operator labor and management	Dollar	5,031			

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 9

Estimated Minimum Requirements for $7,000 Return to Operator Labor and Management, Rolling Loam Soils, Low Rolling Plains of Southwestern Oklahoma, for Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$127.50	$170.00[1]	$212.50	$255.00
Hired labor at $1.00[1] per hour					
Total land	Acre	1,337	3,450		
Cropland	Acre	1,043	2,694		
Cotton	Acre	198	512		
Wheat	Acre	355	916		
Alfalfa	Acre	99	256		
Grain sorghum	Acre	184	474		
Small grain hay	Acre	43	111		
Small grain grazing	Acre	39	101		
Reseeded cropland	Acre	125	324		
Cows	Animal	24	61		
Stocker-calves	Animal	99	254		
Operator labor	Hour	1,708	1,714	No Solution	No Solution
Hired labor	Hour	1,265	5,476		
Investment					
Land and buildings	Dollar	170,468	586,500		
Machinery	Dollar	20,630	46,575		
Operating capital[2]	Dollar	31,353	82,969		
Total capital requirement	Dollar	222,451	716,044		
Gross receipts	Dollar	34,806	89,430		
Operating and overhead expense	Dollar	16,907	47,588		
Return to land[3]	Dollar	8,523	29,325		
Machinery interest and depreciation[4]	Dollar	2,434	5,496		
Return to operator labor and management	Dollar	6,942	7,021		
Hired labor at $1.50 per hour					
Total land	Acre	1,452	10,010		
Cropland	Acre	1,134	7,821		
Cotton	Acre	215	1,485		
Wheat	Acre	386	2,659		
Alfalfa	Acre	108	743		
Grain sorghum	Acre	200	1,545	No Solution	No Solution
Small grain hay	Acre	47	171		
Small grain grazing	Acre	42	279		
Reseeded cropland	Acre	136	939		
Cows	Animal	26	180		
Stocker-calves	Animal	107	698		
Operator labor	Hour	1,714	1,714		
Hired labor	Hour	1,466	18,911		

See footnotes at end of table.

Appendix B, Table 9 (Continued)

Item	Unit	Land price per acre			
		$127.50	$170.00[1]	$212.50	$255.00
Investment					
Land and buildings	Dollar	185,130	1,701,600		
Machinery	Dollar	20,630	135,135		
Operating capital[2]	Dollar	34,864	261,424		
Total capital requirement	Dollar	240,624	2,098,159		
Gross receipts	Dollar	37,777	257,951		
Operating and overhead expense	Dollar	19,146	149,857		
Return to land[3]	Dollar	9,256	85,080		
Machinery interest and depreciation[4]	Dollar	2,434	15,946		
Return to operator labor and management	Dollar	6,941	7,068		
Hired labor at $2.00 per hour					
Total land	Acres	1,612			
Cropland	Acres	1,259			
Cotton	Acre	239			
Wheat	Acre	428			
Alfalfa	Acre	120			
Grain sorghums	Acre	249			
Small grain hay	Acre	27			
Small grain grazing	Acre	45			
Reseeded cropland	Acre	151			
Cows	Animal	29			
Stocker-calves	Animal	113			
Operator labor	Hour	1,714	No Solution	No Solution	No Solution
Hired labor	Hour	1,733			
Investment					
Land and buildings	Dollar	205,530			
Machinery	Dollar	20,630			
Operating capital[2]	Dollar	38,611			
Total capital requirement	Dollar	264,771			
Gross receipts	Dollar	41,800			
Operating and overhead expense	Dollar	22,095			
Return to land[3]	Dollar	10,276			
Machinery interest and depreciation[4]	Dollar	2,434			
Return to operator labor and management	Dollar	6,995			

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 10
Estimated Minimum Requirements for $3,000 Return to Operator Labor and Management, Sandy Soils, Low Rolling Plains of Southwestern Oklahoma, Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$120	$160[1]	$200	$240
Hired labor at $1.00[1] per hour					
Total land	Acre	360	440	502	1,146
Cropland	Acre	281	344	391	895
Cotton	Acre	87	106	121	277
Wheat	Acre	36	45	51	116
Alfalfa	Acre	50	61	69	159
Grain sorghum	Acre	26	32	36	83
Small grain hay	Acre	14	17	19	44
Small grain grazing	Acre	18	22	25	57
Reseeded cropland	Acre	50	61	70	159
Cows	Animal	7	9	10	23
Stocker-calves	Animal	38	46	53	121
Operator labor	Hour	1,351	1,437	1,505	1,714
Hired labor	Hour	37	129	200	1,427
Investment					
Land and buildings	Dollar	43,200	70,400	100,400	275,040
Machinery	Dollar	8,485	8,485	8,485	13,752
Operating capital[2]	Dollar	11,544	14,205	16,262	38,187
Total capital requirement	Dollar	63,229	93,090	125,147	326,979
Gross receipts	Dollar	12,199	14,909	17,067	38,856
Operating and overhead expense	Dollar	6,040	7,392	8,053	20,473
Return to land[3]	Dollar	2,160	3,520	5,020	13,752
Machinery interest and depreciation[4]	Dollar	1,001	1,001	1,001	1,623
Return to operator labor and management	Dollar	2,998	2,996	2,993	3,008
Hired labor at $1.50 per hour					
Total land	Acre	361	447	528	
Cropland	Acre	282	349	413	
Cotton	Acre	87	109	128	
Wheat	Acre	37	45	54	
Alfalfa	Acre	50	62	73	
Grain sorghum	Acre	26	32	38	
Small grain hay	Acre	14	17	20	
Small grain grazing	Acre	18	22	26	
Reseeded cropland	Acre	50	62	74	
Cows	Animal	7	9	10	
Stocker-calves	Animal	38	47	56	
Operator labor	Hour	1,352	1,405	1,532	
Hired labor	Hour	28	127	221	

No Solution

See footnotes at end of table.

Appendix B, Table 10 (Continued)

Item	Unit	Land price per acre $120	$160[1]	$200	$240
Investment					
Land and buildings	Dollar	43,320	71,520	105,600	
Machinery	Dollar	8,485	8,485	8,485	
Operating capital[2]	Dollar	11,599	14,400	17,248	
Total capital requirement	Dollar	63,404	94,405	131,333	
Gross receipts	Dollar	12,244	15,160	17,904	
Operating and overhead expense	Dollar	5,800	7,582	8,623	
Return to land[3]	Dollar	2,166	3,576	5,280	
Machinery interest and depreciation[4]	Dollar	1,001	1,001	1,001	
Return to operator labor and management	Dollar	3,277	3,001	3,000	
Hired labor at $2.00 per hour					
Total land	Acre	362	455	564	
Cropland	Acre	284	356	442	
Cotton	Acre	88	111	137	
Wheat	Acre	37	46	57	
Alfalfa	Acre	51	63	79	
Grain sorghum	Acre	26	33	41	
Small grain hay	Acre	14	17	22	
Small grain grazing	Acre	18	23	28	
Reseeded cropland	Acre	50	63	78	
Cows	Animal	7	9	11	
Stocker-calves	Animal	38	48	59	
Operator labor	Hour	1,354	1,455	1,585	
Hired labor	Hour	29	137	262	
Investment					
Land and buildings	Dollar	43,440	72,800	112,800	
Machinery	Dollar	8,485	8,485	8,485	
Operating capital[2]	Dollar	11,660	14,590	18,686	
Total capital requirement	Dollar	63,585	95,875	139,971	
Gross receipts	Dollar	12,294	15,444	19,133	
Operating and overhead expense	Dollar	6,116	7,798	9,487	
Return to land[3]	Dollar	2,172	3,640	5,640	
Machinery interest and depreciation[4]	Dollar	1,001	1,001	1,001	
Return to operator labor and management	Dollar	3,005	3,005	3,005	

No Solution

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 11
Estimated Minimum Requirements for $5,000 Return to Operator Labor and Management, Sandy Soils, Low Rolling Plains of Southwestern Oklahoma, Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$120	$160[1]	$200	$240
Hired labor at $1.00[1] per hour					
Total land	Acre	610	753	1,056	2,874
Cropland	Acre	476	588	825	2,245
Cotton	Acre	148	182	256	696
Wheat	Acre	62	76	107	292
Alfalfa	Acre	85	104	146	398
Grain sorghum	Acre	44	55	77	208
Small grain hay	Acre	23	29	40	110
Small grain grazing	Acre	30	38	53	143
Reseeded cropland	Acre	84	104	146	398
Cows	Animal	12	15	21	57
Stocker-calves	Animal	64	79	111	302
Operator labor	Hour	1,622	1,714	1,714	1,714
Hired labor	Hour	324	543	1,225	5,709
Investment					
Land and buildings	Dollar	73,200	120,480	211,200	689,760
Machinery	Dollar	13,356	13,356	13,356	34,488
Operating capital[2]	Dollar	19,443	24,690	35,076	97,892
Total capital requirement	Dollar	105,999	158,526	259,632	822,140
Gross receipts	Dollar	20,694	25,534	35,786	97,405
Operating and overhead expense	Dollar	10,456	12,934	18,655	53,842
Return to land[3]	Dollar	3,660	6,024	10,560	34,488
Machinery interest and depreciation[4]	Dollar	1,576	1,576	1,576	4,070
Return to operator labor and management	Dollar	5,002	5,000	4,995	5,005
Hired labor at $1.50 per hour					
Total land	Acre	626	795	1,365	
Cropland	Acre	489	621	1,067	
Cotton	Acre	152	192	330	
Wheat	Acre	63	81	139	
Alfalfa	Acre	87	110	190	
Grain sorghum	Acre	45	58	99	
Small grain hay	Acre	24	30	52	
Small grain grazing	Acre	31	40	68	
Reseeded cropland	Acre	87	110	189	
Cows	Animal	12	16	27	
Stocker-calves	Animal	66	84	143	
Operator labor	Hour	1,639	1,714	1,714	
Hired labor	Hour	334	636	1,912	

No Solution

See footnotes at end of table.

Appendix B, Table 11 (Continued)

Item	Unit	Land price per acre $120	$160[1]	$200	$240
Investment					
Land and buildings	Dollar	75,120	127,200	273,000	
Machinery	Dollar	13,356	13,356	16,380	
Operating capital[2]	Dollar	20,564	26,443	46,664	
Total capital requirement	Dollar	109,040	166,999	336,044	
Gross receipts	Dollar	21,226	26,953	46,282	
Operating and overhead expense	Dollar	10,894	14,022	25,687	
Return to land[3]	Dollar	3,756	6,360	13,650	
Machinery interest and depreciation[4]	Dollar	1,576	1,576	1,933	
Return to operator labor and management	Dollar	5,000	4,995	5,012	
Hired labor at $2.00 per hour					
Total land	Acre	644	852	3,274	
Cropland	Acre	501	665	2,557	
Cotton	Acre	156	206	793	
Wheat	Acre	65	86	332	
Alfalfa	Acre	87	118	454	
Grain sorghum	Acre	47	62	237	
Small grain hay	Acre	25	33	126	
Small grain grazing	Acre	32	42	163	
Reseeded cropland	Acre	89	118	452	
Cows	Animal	13	16	65	
Stocker-calves	Animal	68	89	343	
Operator labor	Hour	1,658	1,704	1,714	No Solution
Hired labor	Hour	354	644	6,742	
Investment					
Land and buildings	Dollar	77,280	136,320	654,800	
Machinery	Dollar	13,356	13,356	39,288	
Operating capital[2]	Dollar	21,335	27,836	118,489	
Total capital requirement	Dollar	111,971	177,512	812,577	
Gross receipts	Dollar	21,821	28,715	110,971	
Operating and overhead expense	Dollar	11,383	15,333	63,581	
Return to land[3]	Dollar	3,864	6,816	32,740	
Machinery interest and depreciation[4]	Dollar	1,576	1,576	4,636	
Return to operator labor and management	Dollar	4,998	4,990	5,014	

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.

Appendix B, Table 12
Estimated Minimum Requirements for $7,000 Return to Operator Labor and Management, Sandy Soils, Low Rolling Plains of Southwestern Oklahoma, Specified Land and Hired Labor Prices

Item	Unit	Land price per acre			
		$120	$160[1]	$200	$240
Hired labor at $1.00[1] per hour					
Total land	Acre	840	1,053	1,676	4,646
Cropland	Acre	656	822	1,308	3,630
Cotton	Acre	203	255	406	1,125
Wheat	Acre	85	107	170	472
Alfalfa	Acre	117	146	232	644
Grain sorghum	Acre	61	76	121	337
Small grain hay	Acre	32	40	64	178
Small grain grazing	Acre	42	52	84	232
Reseeded cropland	Acre	116	146	231	642
Cows	Animal	17	21	33	92
Stocker-calves	Animal	88	110	176	487
Operator labor	Hour	1,714	1,714	1,714	1,714
Hired labor	Hour	744	1,219	2,614	10,287
Investment					
Land and buildings	Dollar	100,800	168,480	335,200	1,115,040
Machinery	Dollar	14,761	14,761	20,112	55,752
Operating capital[2]	Dollar	27,672	37,538	56,301	158,328
Total capital requirement	Dollar	143,233	220,779	411,613	1,329,120
Gross receipts	Dollar	28,478	35,684	56,808	157,476
Operating and overhead expense	Dollar	14,695	18,523	30,669	88,128
Return to land[3]	Dollar	5,040	8,424	16,760	55,752
Machinery interest and depreciation[4]	Dollar	1,742	1,742	2,373	6,579
Return to operator labor and management	Dollar	7,001	6,995	7,006	7,017
Hired labor at $1.50 per hour					
Total land	Acre	884	1,147	2,445	
Cropland	Acre	691	896	1,910	
Cotton	Acre	214	278	592	
Wheat	Acre	90	116	248	
Alfalfa	Acre	123	159	339	
Grain sorghum	Acre	64	83	177	
Small grain hay	Acre	34	44	94	
Small grain grazing	Acre	44	57	122	
Reseeded cropland	Acre	122	159	338	
Cows	Animal	17	23	48	
Stocker-calves	Animal	93	121	256	
Operator labor	Hour	1,714	1,714	1,714	
Hired labor	Hour	836	1,425	4,603	

No Solution

See footnotes at end of tables.

Appendix B, Table 12 (Continued)

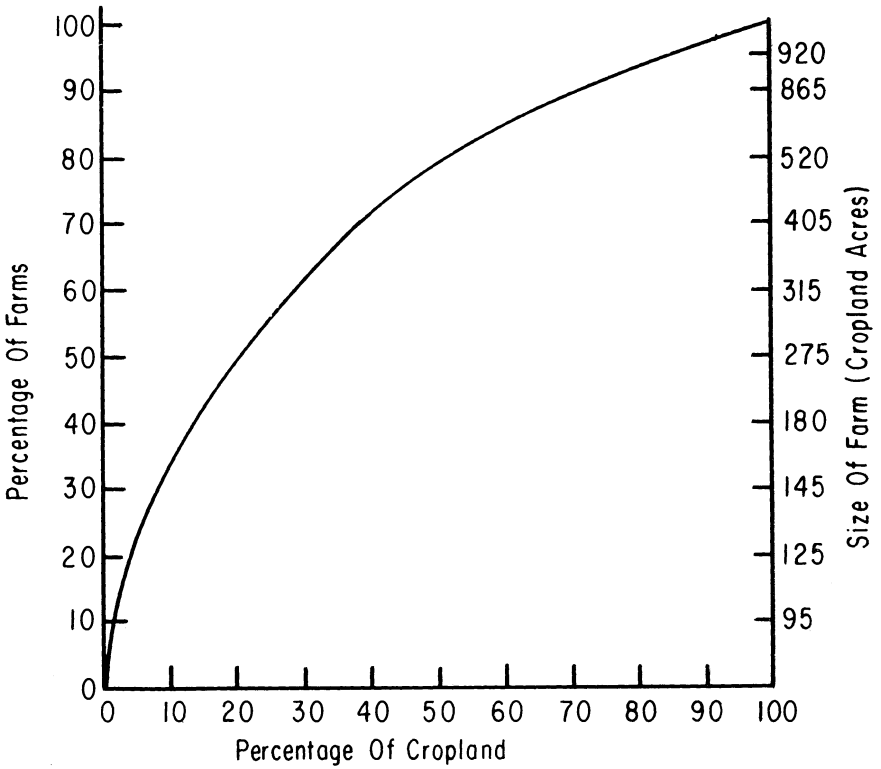
Item	Unit	Land price per acre $120	$160[1]	$200	$240
Investment					
Land and buildings	Dollar	106,080	183,520	489,000	
Machinery	Dollar	14,761	14,761	29,340	
Operating capital[2]	Dollar	29,599	38,917	85,350	
Total capital requirement	Dollar	150,440	237,198	603,690	
Gross receipts	Dollar	29,968	38,873	82,889	
Operating and overhead expense	Dollar	15,882	20,960	47,962	
Return to land[3]	Dollar	5,304	9,176	24,450	
Machinery interest and depreciation[4]	Dollar	1,742	1,742	3,462	
Return to operator labor and management	Dollar	7,040	6,995	7,015	
Hired labor at $2.00 per hour					
Total land	Acre	939	1,276	7,750	
Cropland	Acre	733	997	6,056	
Cotton	Acre	227	309	1,876	
Wheat	Acre	95	129	787	
Alfalfa	Acre	130	177	1,074	
Grain sorghum	Acre	68	92	562	
Small grain hay	Acre	36	49	297	
Small grain grazing	Acre	47	64	387	
Reseeded cropland	Acre	130	177	1,073	
Cows	Animal	18	25	153	No Solution
Stocker-calves	Animal	98	134	812	
Operator labor	Hour	1,714	1,714	1,714	
Hired labor	Hour	805	1,561	18,304	
Investment					
Land and buildings	Dollar	112,630	204,160	1,550,000	
Machinery	Dollar	14,761	14,761	93,000	
Operating capital[2]	Dollar	31,632	42,396	285,130	
Total capital requirement	Dollar	159,073	261,317	1,928,130	
Gross receipts	Dollar	31,618	43,036	262,685	
Operating and overhead expense	Dollar	17,242	24,089	167,178	
Return to land[3]	Dollar	5,634	10,208	77,500	
Machinery interest and depreciation[4]	Dollar	1,742	1,742	10,974	
Return to operator labor and management	Dollar	7,000	6,997	7,033	

[1]Assumed current price.

[2]Includes the capital required to operate the farm for one year, including purchase of feed, seed, fertilizer, hired labor, and cows and feeders bought during the year.

[3]Five percent of the investment in land and buildings.

[4]Machinery interest is computed at 6 percent of the annual investment. Annual investment is one-half of the total investment in machinery. Annual depreciation is calculated by subtracting a salvage value of 12 percent of the total investment from the total investment and dividing by 10 years.



Total Farms--2,447, Total Cropland--780,843 Acres

Appendix C, Figure 1. Estimated current percentage distribution of farms by size, clay soils of the Low Rolling Plains of Southwestern Oklahoma.

Appendix C, Table 1

Maximum Number of Farming Units Consistent with $3,000, $5,000, and $7,000 Return to Operator Labor and Management, Specified Land and Hired Labor Prices; Net Change and Percentage Change if All Farmers Adjust, and Number of Farms Currently Above Level; Clay Soils of Low Rolling Plains of Southwestern Oklahoma

Total Cropland (780,843 Acres)

Hired labor per hour	Present number of farms	Land price per acre: $78.85 — Crop land requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level	Land price per acre: $105.00[2] — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level
				$3,000 return to operator labor and management							
$1.00[2]	2,447	453	1,724	—723	—29.5	629	546	1,430	—1,017	—41.6	449
$1.50	2,447	467	1,672	—775	—31.7	598	573	1,363	—1,084	—44.3	407
$2.00	2,447	482	1,620	—827	—33.8	565	603	1,295	—1,152	—47.1	361
				$5,000 return to operator labor and management							
$1.00[2]	2,447	715	1,092	—1,355	—55.4	262	866	902	—1,545	—63.1	155
$1.50	2,447	750	1,041	—1,406	—57.5	230	932	833	—1,609	—65.8	125
$2.00	2,447	792	986	—1,461	—59.7	191	1,024	763	—1,684	—68.8	84
				$7,000 return to operator labor and management							
$1.00[2]	2,447	983	794	—1,653	—67.6	100	1,206	647	—1,800	—73.6	42
$1.50	2,447	1,055	740	—1,707	—69.8	73	1,348	579	—1,868	—76.3	26
$2.00	2,447	1,159	674	—1,773	—72.5	49	1,572	497	—1,950	—79.7	20

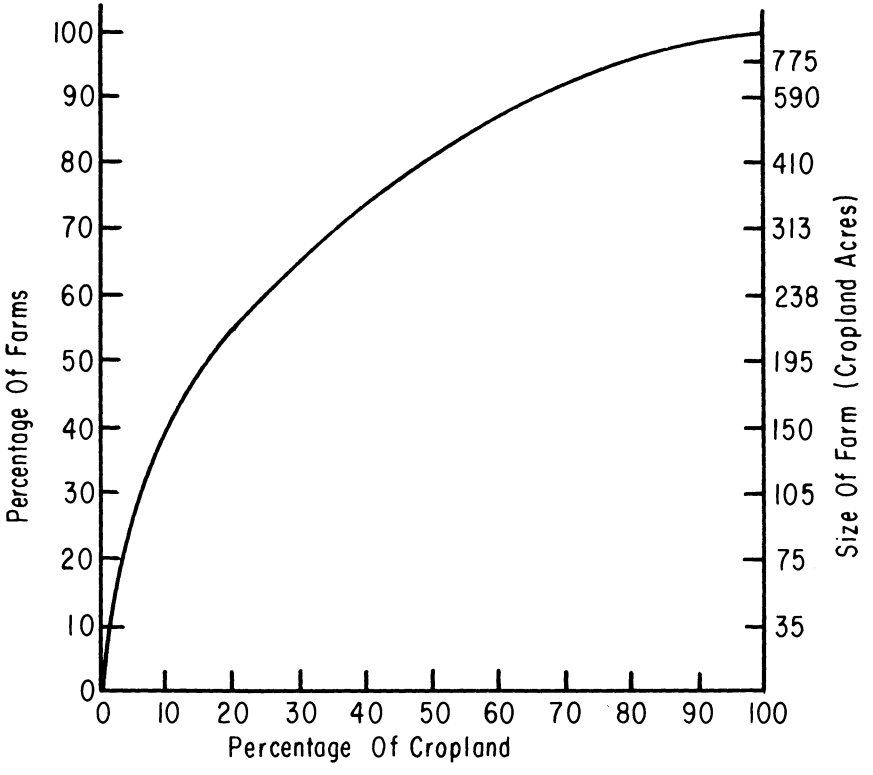
See footnotes at end of table.

CONTINUED

Appendix C, Table 1 (Continued)

Hired labor per hour	Present number of farms	Land price per acre: $131.25 — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level	Land price per acre: $157.50 — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level
				$3,000 return to operator labor and management							
$1.00[2]	2,447	644	1,212	—1,235	—50.5	335	1,481	527	—1,920	—78.5	22
$1.50	2,447	736	1,061	—1,386	—56.6	243	No Solution				
$2.00	2,447	987	791	—1,656	—67.7	98	No Solution				
				$5,000 return to operator labor and management							
$1.00[2]	2,447	1,303	599	—1,848	—75.5	28	3,634	215	—2,232	—91.2	0
$1.50	2,447	1,983	394	—2,053	—83.9	14	No Solution				
$2.00	2,447	No Solution					No Solution				
				$7,000 return to operator labor and management							
$1.00[2]	2,447	2,039	383	—2,064	—84.3	12	5,900	132	—2,315	—94.6	0
$1.50	2,447	3,648	214	—2,233	—91.3	0	No Solution				
$2.00	2,447	No Solution					No Solution				

[1]Number of farms possible if all farmers adjusted to this level, that is, those above adjust downward and those below adjust upward.
[2]Assumed current price for land and hired labor.



Total Farms--2,361, Total Cropland--605,002 Acres

Appendix C, Figure 2. Estimated current percentage distribution of farms by size, level loam soils of the Low Rolling Plains of Southwestern Oklahoma.

Appendix C, Table 2

Maximum Number of Farming Units Consistent with $3,000, $5,000, and $7,000 Return to Operator Labor and Management, Specified Land and Hired Labor Prices; Net Change and Percentage Change if All Farmers Adjust, and Number of Farms Currently Above Level; Level Loam Soils of Low Rolling Plains of Southwestern Oklahoma

Total Cropland (605,002 acres)

Hired labor per hour	Present number of farms	Land price per acre: $180.00 — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level	Land price per acre: $240.00[2] — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level
				$3,000 return to operator labor and management							
$1.00[2]	2,361	255	2,373	+12	+.5	944	334	1,811	—550	—23.3	699
$1.50	2,361	255	2,373	+12	+.5	944	336	1,801	—560	—23.7	690
$2.00	2,361	255	2,373	+12	+.5	944	340	1,779	—582	—24.7	677
				$5,000 return to operator labor and management							
$1.00[2]	2,361	401	1,509	—852	—36.1	484	535	1,131	—1,230	—52.1	285
$1.50	2,361	408	1,483	—878	—37.2	471	555	1,090	—1,271	—53.8	264
$2.00	2,361	416	1,454	—907	—38.4	458	577	1,049	—1,312	—55.6	241
				$7,000 return to operator labor and management							
$1.00[2]	2,361	574	1,054	—1,307	—55.4	245	767	789	—1,572	—66.6	121
$1.50	2,361	591	1,024	—1,337	—56.6	226	813	744	—1,617	—68.5	108
$2.00	2,361	610	992	—1,369	—58.0	209	873	693	—1,668	—70.6	83

See footnotes at end of table.

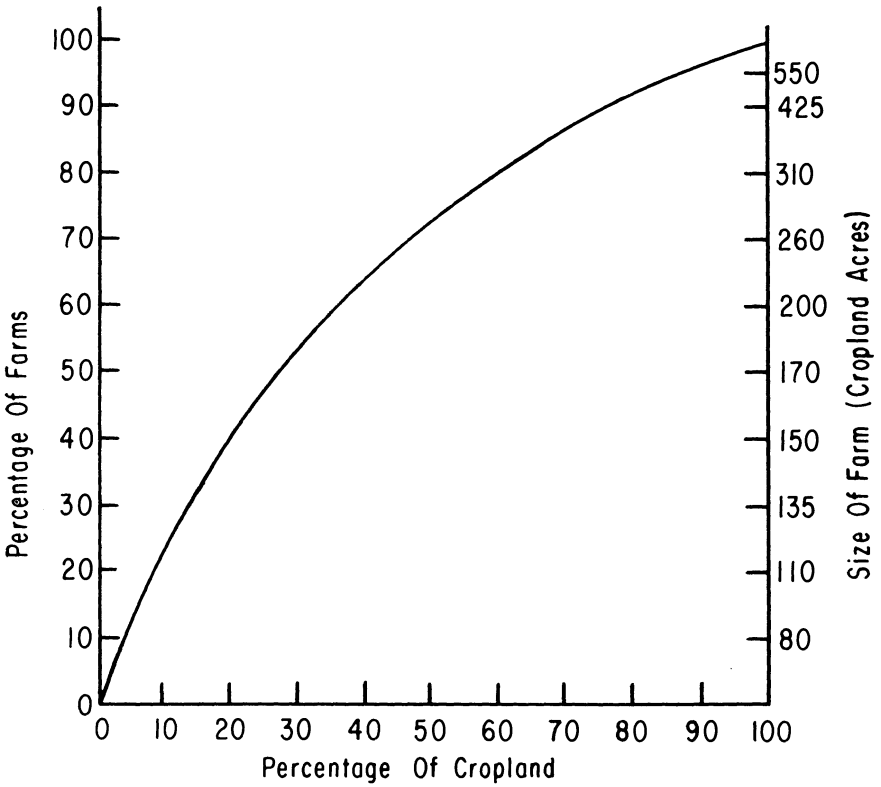
Appendix C, Table 2 (Continued)

Hired labor per hour	Present number of farms	Land price per acre: $300.00 — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level	$360.00[2] — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level
				$3,000 return to operator labor and management							
$1.00[2]	2,361	443	1,366	—995	—42.1	414					
$1.50	2,361	478	1,266	—1,095	—46.4	366	*	*	*	*	*
$2.00	2,361	534	1,133	—1,228	—52.0	286					
				$5,000 return to operator labor and management							
$1.00[2]	2,361	921	657	—1,704	—72.2	68					
$1.50	2,361	1,219	496	—1,865	—79.0	35	*	*	*	*	*
$2.00	2,361	6,750	90	—2,271	—96.2	0					
				$7,000 return to operator labor and management							
$1.00	2,361	1,507	401	—1,960	—83.0	30					
$1.50	2,361	2,285	265	—2,096	—88.8	10	*	*	*	*	*
$2.00	2,361	21,706	28	—2,333	—98.8	0					

[1]Number of farms possible if all farmers adjusted to this level, that is, those above adjust downward and those below adjust upward.

[2]Assumed current price for land and hired labor.

*No Solution



Total Farms--1,771, Total Cropland--365,279 Acres

Appendix C, Figure 3. Estimated current percentage distribution of farms by size, rolling loam soils of the Low Rolling Plains of Southwestern Oklahoma.

Appendix C, Table 3

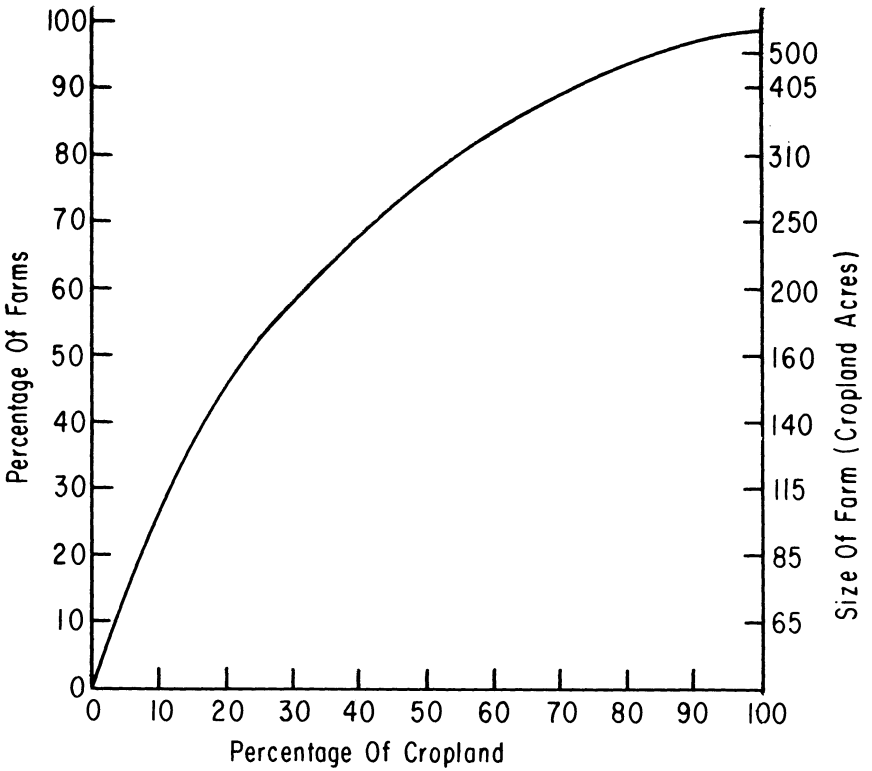
Maximum Number of Farming Units Consistent with $3,000, $5,000, and $7,000 Return to Operator Labor and Management, Specified Land and Hired Labor Prices; Net Change and Percentage Change if All Farmers Adjust, and Number of Farms Currently Above Level; Rolling Loam Soils of Low Rolling Plains of Southwestern Oklahoma

Total Cropland (365,279 acres)

Hired labor per hour	Present number of farms	Land price per acre: $127.50 — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level	Land price per acre: $170.00[2] — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level
				$3,000 return to operator labor and management							
$1.00[2]	1,771	483	756	—1,015	—57.3	137	691	529	—1,242	—70.1	33
$1.50	1,771	492	742	—1,029	—58.1	128	926	394	—1,377	—77.8	9
$2.00	1,771	505	723	—1,048	—59.2	121	No Solution				
				$5,000 return to operator labor and management							
$1.00[2]	1,771	740	494	—1,277	—72.1	26	1,652	221	—1,550	—87.5	0
$1.50	1,771	782	467	—1,304	—73.6	22	4,171	88	—1,683	—95.0	0
$2.00	1,771	842	434	—1,337	—75.5	16	No Solution				
				$7,000 return to operator labor and management							
$1.00[2]	1,771	1,043	350	—1,421	—80.2	0	2,694	136	—1,635	—92.3	0
$1.50	1,771	1,134	322	—1,449	—81.8	0	7,821	47	—1,724	—97.3	0
$2.00	1,771	1,259	290	—1,481	—83.6	0	No Solution				

[1]Number of farms possible if all farmers adjusted to this level, that is, those above adjust downward and those below adjust upward.

[2]Assumed current price for land and hired labor.



Total Farms--2,684, Total Cropland--537,548 Acres

Appendix C, Figure 4. Estimated current percentage distribution of farms by size, sandy soils of the Low Rolling Plains of Southwestern Oklahoma.

Appendix C, Table 4

Maximum Number of Farming Units Consistent with $3,000, $5,000, and $7,000 Return to Operator Labor and Management, Specified Land and Hired Labor Prices; Net Change and Percentage Change if All Farmers Adjust, and Number of Farms Currently Above Level; Sandy Soils of Low Rolling Plains of Southwestern Oklahoma

Total cropland (537,548 acres)

Hired labor per hour	Present number of farms	Land price per acre: $120.00 — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level	$160.00[2] — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level
				$3,000 return to operator labor and management							
$1.00[2]	2,684	281	1,913	—771	—28.7	650	344	1,563	—1,121	—41.8	432
$1.50	2,684	282	1,906	—778	—29.0	650	349	1,540	—1,144	—42.6	420
$2.00	2,684	284	1,893	—791	—29.5	650	356	1,510	—1,174	—43.7	402
				$5,000 return to operator labor and management							
$1.00[2]	2,684	476	1,129	—1,555	—57.9	175	588	914	—1,770	—66.0	90
$1.50	2,684	489	1,099	—1,585	—59.1	157	621	866	—1,818	—67.7	77
$2.00	2,684	501	1,073	—1,611	—60.0	140	665	808	—1,876	—69.9	71
				$7,000 return to operator labor and management							
$1.00[2]	2,684	656	819	—1,865	—69.5	72	822	654	—2,030	—75.6	36
$1.50	2,684	691	778	—1,906	—71.0	66	896	600	—2,084	—77.6	21
$2.00	2,684	733	733	—1,951	—72.7	57	997	539	—2,145	—79.9	21

See footnotes at end of table.

CONTINUED

Appendix C, Table 4 (Continued)

Hired labor per hour	Present number of farms	Land price per acre: $200 — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level	$240 — Cropland requirement per farm	Maximum[1] number of farms possible	Change from present	Percentage change	Present number above level
				$3,000 return to operator labor and management							
$1.00[2]	2,684	391	1,375	—1,309	—48.8	304	895	601	—2,083	—77.6	24
$1.50	2,684	413	1,302	—1,382	—51.5	270	No Solution				
$2.00	2,684	442	1,216	—1,468	—54.7	224	No Solution				
				$5,000 return to operator labor and management							
$1.00[2]	2,684	825	652	—2,032	—75.7	35	2,245	239	—2,445	—91.1	0
$1.50	2,684	1,067	504	—2,180	—81.2	20	No Solution				
$2.00	2,684	2,557	210	—2,474	—92.2	0	No Solution				
				$7,000 return to operator labor and management							
$1.00[2]	2,684	1,308	411	—2,273	—84.7	14	3,630	148	—2,536	—94.5	0
$1.50	2,684	1,910	281	—2,403	—89.5	8	No Solution				
$2.00	2,684	6,056	89	—2,595	—96.7	0	No Solution				

[1]Number of farms possible if all farmers adjusted to this level, that is, those above adjust downward and those below adjust upward.

[2]Assumed current price for land and hired labor.

Appendix D, Table 1
Estimated Minimum Resource Requirements to Obtain Specified Returns to Operator Owned Resources,[1] Clay Soils of Low Rolling Plains of Southwestern Oklahoma, Current Land ($105 per Acre) and Hired Labor ($1.00 per Hour) Prices

Item	Unit	Net returns		
		$3,000	$5,000	$7,000
Total land	Acre	576	1,043	1,549
Cropland	Acre	449	815	1,210
Land purchased	Acre	416	883	1,389
Crops	Acre			
Cotton	Acre	54	98	145
Wheat	Acre	216	391	581
Oats	Acre	19	35	53
Small grain hay	Acre	61	112	166
Small grain grazing	Acre	25	45	67
Sudan grazing	Acre	61	111	136
Blue panic sudan	Acre	--	--	27
Fallow	Acre	13	23	35
Stocker-calves	Number	124	225	355
Operator labor	Hour	1,205	1,448	1,595
Hired labor	Hour	218	750	1,638
Investment in land owned	Dollar	16,800	16,800	16,800
Value of land purchased	Dollar	43,680	92,715	145,845
Machinery investment	Dollar	12,420	15,720	18,975
Operating capital	Dollar	20,428	37,496	56,255
Gross receipts	Dol'ar	13,120	23,778	35,328
Operating and overhead expense	Dollar	6,301	11,600	17,549
Land payment[2]	Dollar	2,729	5,792	9,112
Machinery depreciation	Dollar	1,093	1,383	1,670
Return to operator	Dollar	2,997	5,003	6,997

[1]Operator labor and management, 160 acres of land and farm machinery.

[2]The purchased land is amortized at 5 percent interest over 33 years.

Appendix D, Table 2

Estimated Minimum Resource Requirements to Obtain Specified Returns to Operator Owned Resources,[1] Level Loam Soils, Low Rolling Plains of Southwestern Oklahoma, Current Land ($240 per Acre) and Hired Labor ($1.00 per Hour) Prices

Item	Unit	Net returns		
		$3,000	$5,000	$7,000
Total land	Acre	237	569	984
Crop'and	Acre	186	443	769
Land purchased	Acre	77	409	824
Crops	Acre			
Cotton	Acre	37	89	154
Wheat	Acre	53	128	223
Alfalfa	Acre	43	101	175
Grain sorghum	Acre	39	93	162
Small grain hay	Acre	5	12	20
Small grain grazing	Acre	9	20	35
Cows	Number	2	6	10
Stocker-calves	Number	20	48	84
Operator labor	Hour	1,050	1,496	1,714
Hired labor	Hour	0	316	960
Investment in land owned	Dollar	38,400	38,400	38,400
Value of land purchased	Dollar	18,480	98,160	197,670
Machinery investment	Dollar	9,170	10,420	14,315
Operating capital	Dollar	5,412	13,397	23,621
Gross receipts	Dollar	7,999	19,341	33,448
Operating and overhead expense	Dollar	3,027	7,280	12,827
Land payment[2]	Dollar	1,155	6,139	12,365
Machinery depreciation	Dollar	806	916	1,259
Return to operator	Dollar	3,011	5,006	6,997

[1]Operator labor and management, 160 acres of land and farm machinery.

[2]The purchased land is amortized at 5 percent interest over 33 years.

Appendix D, Table 3

Estimated Minimum Resource Requirements to Obtain Specified Returns to Operator Owned Resources,[1] Rolling Loam Soils, Low Rolling Plains of Southwestern Oklahoma, Current Land ($170 per Acre) and Hired Labor ($1.00 per Hour) Prices

Item	Unit	Net returns		
		$3,000	$5,000	$7,000
Total land	Acre	760	1,717	2,836
Cropland	Acre	593	1,342	2,216
Land purchased	Acre	600	1,557	2,676
Crops	Acre			
Cotton	Acre	113	255	421
Wheat	Acre	201	456	753
Alfalfa	Acre	57	128	211
Grain sorghum	Acre	105	237	391
Small grain hay	Acre	24	55	91
Small grain grazing	Acre	22	50	83
Reseeded cropland	Acre	71	161	266
Cows	Each	13	31	50
Stocker-calves	Each	57	127	209
Operator labor	Hour	1,606	1,714	1,714
Hired labor	Hour	328	1,946	4,198
Investment in land owned	Dollar	27,200	27,200	27,200
Value of land purchased	Dollar	102,000	264,690	428,160
Machinery investment	Dollar	12,315	15,720	20,630
Operating capital	Dollar	17,438	40,541	67,896
Gross receipts	Dollar	19,768	44,551	73,533
Operating and overhead expense	Dollar	9,079	21,637	36,276
Land payment[2]	Dollar	6,372	16,535	28,419
Machinery depreciation	Dollar	1,240	1,383	1,815
Return to operator	Dollar	3,077	4,996	7,023

[1]Operator labor and management, 160 acres of land and farm machinery.

[2]The purchased land is amortized at 5 percent interest over 33 years.

Appendix D, Table 4

Estimated Minimum Resource Requirements to Obtain Specified Returns to Operator Owned Resources,[1] Sandy Soils, Low Rolling Plains of Southwestern Oklahoma, Current Land ($160 per Acre) and Hired Labor ($1.00 per Hour) Prices

Item	Unit	Net returns		
		$3,000	$5,000	$7,000
Total land	Acre	302	673	1,062
Cropland	Acre	237	526	829
Land purchased	Acre	142	513	902
Crops	Acre			
Cotton	Acre	74	163	257
Wheat	Acre	30	68	108
Alfalfa	Acre	42	93	147
Grain sorghum	Acre	22	49	77
Small grain hay	Acre	24	26	41
Small grain grazing	Acre	16	34	53
Reseeded cropland	Acre	29	93	146
Cows	Each	2	13	21
Stocker-calves	Each	47	71	112
Operator labor	Hour	1,271	1,690	1,714
Hired labor	Hour	0	396	1,241
Investment in land owned	Dollar	25,600	25,600	25,600
Investment in land purchased	Dollar	22,720	82,080	144,320
Machinery investment	Dollar	8,450	13,356	14,761
Operating capital	Dollar	11,541	21,572	35,326
Gross receipts	Dollar	10,915	22,524	36,036
Operating and overhead expense	Dollar	5,405	11,131	18,713
Land payment[2]	Dollar	1,428	5,127	9,025
Machinery depreciation	Dollar	1,001	1,175	1,297
Net return to operator	Dollar	3,081	5,091	7,001

[1]Operator labor and management, 160 acres of land and farm machinery.

[2]The purchased land is amortized at 5 percent interest over 33 years.