MINIMUM RESOURCE REQUIREMENTS AND RESOURCE ADJUSTMENTS FOR SPECIFIED FARM INCOME LEVELS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

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PREFACE

The agricultural sector of the American economy faces constantly changing conditions which cause the achievement of an economic balance in agriculture to be a continuous problem. The federal government has programs designed to bring farm production in line with demand and to support agricultural incomes. However, average farm income is still substantially lower than incomes in nonfarm employment. Many of the existing programs were developed without adequate economic research as to their likely effects.

To provide guides in the selection and evaluation of programs, the United States Department of Agriculture in cooperation with the Agricultural Experiment Stations in the southern region initiated a study in 1958 known as Southern Regional Project S-42. The title of this study is: "An Economic Appraisal of Farming Adjustment Opportunities in the Southern Region to Meet Changing Conditions."

The stated objectives of the project are, "To provide guides to farmers when choosing among alternative production opportunities, to provide guides to farmers, to those persons engaged directly in making and administering public programs and to the public at large in order that choices of action at the public level may be made in a manner consistent with public objectives."

The research reported in this dissertation is a part of the research being conducted at Oklahoma State University under a state project contributing to the S-42 project. The Oklahoma project is Agricultural Experiment Station Project 1040, "An Economic Appraisal of Farming

Adjustment Opportunities to Meet Changing Conditions in Southwestern Oklahoma." The overall design and assumptions of the study were reviewed and approved by the methodology sub-committee of the regional S-42 project. The specific results and the interpretations of the results are those of the author.

I am deeply indebted to Dr. James S. Plaxico, Graduate Committee Chairman, for his encouragement and counsel throughout my graduate program, and for supervision and constructive criticism during the preparation of this thesis. I am also indebted to the Department of Agricultural Economics and its graduate committee for encouraging and allowing me to continue my graduate work and for making this study possible.

Appreciation is extended to Dr. Leo V. Blakley and Professor K. C. Davis, members of the graduate committee, and to Dr. Odell L. Walker for reading parts or all of earlier drafts and offering helpful suggestions and advice for its improvement. Mr. William F. Lagrone and Larry J. Connor of the U. S. Department of Agriculture stationed at Stillwater and John W. Goodwin, Instructor in the Department of Agricultural Economics were very helpful in preparing the budgets used in the study and in setting up the model for linear programming.

Thanks are also extended to Miss Pat Cundiff and other members of the statistical section of the Department for their assistance in making the many computations, and to the secretarial staff for typing the preliminary drafts of the thesis. Mrs. Cassie Spencer, Supervisor of the Data Processing Center, was of much assistance while I was making the many computations on the IBM 650.

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Finally, special appreciation is due my wife, Deborah, for her patience and encouragement while I worked on the thesis, and to my parents, Mr. and Mrs. Percy Strickland, whose encouragement and financial assistance made my college education possible.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF FIGURES

CHAPTER I

INTRODUCTION AND PROBLEM SETTING

Adjustment in a resource allocation can increase the rate of economic growth and the welfare of a nation. The potential rate of a country's economic growth is determined by the technology and resources available. The realized rate of growth is determined by the degree to which the economy adopts the available technology and adjusts resource use.

Technological advancements and changes in demand for products occur at different rates in the various sectors of the economy. As a consequence of these differing rates of change, technological advancements may cause some sectors of the economy to produce more product than the economy will consume at a price which will give comparable resource returns in all sectors. Therefore, adjustments in resource use from this sector of the economy to other sectors of the economy may be desirable.

The maximum rate of economic growth is 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 of the economy. The rate of growth can be closely associated with maximum efficiency of resource use. 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.

Leftwich states,

> Units of a resource are incorrectly allocated among different uses when their value of marginal product in one use exceeds their value of marginal product in another or other uses . . . . . Firms in which the value of marginal product of a given resource is lower are not willing to pay more for it than its value of marginal product. On the other hand, firms in which its value of marginal product is higher can increase profits by expanding the quantity employed. . . . . As units of the resource are transfered, its value of marginal product decreases in the employment to which it transfers and increases in the employment from which it is transferred. The transfer continues until its value of marginal product is equalized in all its uses and all firms in the market pay a price per unit equal to its value of marginal product. At this point, the resource is correctly allocated and, within the submarket, makes its maximum contribution to net national product.[1]

Leftwich further expands the analysis to allocations among different sectors or submarkets. Using labor as an example, he assumed that Area I had a low wage and a low value of marginal product for labor. Area II had a much higher wage and value of marginal product for labor.

> Each transfer of a unit of labor from Area I to Area II brings about such a net increase (in total value of product produced by the economy) until the values of marginal product and the wage rates of labor are the same in the two areas. No further transfer of labor in either direction can increase net national product, but will decrease it instead.[2]

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[1]Richard H. Leftwich, The Price System and Resource Allocation, Rhinehart and Company, New York, Revised edition, 1960, p. 322.

[2]Ibid., p. 326.

In recent years, the agricultural sector of the economy has been characterized by a high rate of technological development and adaptation. New crop varieties, fertilizers, methods of production and new and better machinery have been developed. These innovations increase the production potential of agriculture and provide for substitution of capital for labor in production. These advancements have given agriculture the means to produce larger quantities of commodities than the market can absorb at constant price levels. They provide a possible basis for further economic growth in the economy if the following developments occur:

1. Technological advancements are adopted on farms,
2. Resources are adjusted within agriculture to allow full utilization of the techniques, and
3. Adjustments are made between agriculture and other sectors of the economy to allow the "freed" resources to be employed so that the real output of the economy and incomes will increase.

Symptoms of Maladjustment

Symptoms in the American economy indicate that optimum adjustments have not been made within agriculture and between agriculture and other sectors of the economy. Three obvious symptoms of the lack of these adjustments are:

1. Agricultural production persistently exceeds the domestic and foreign demand at prices acceptable to producers, as shown by the growing surplus of many agricultural commodities,
2. Incomes in the farm sector have failed to keep pace with incomes in other sectors of the economy,

3. There is a persistence of low income or poverty areas that have and are being bypassed by economic growth and development. Geographically these areas are concentrated in the South with a further concentration within the farm sector of the South's economy.[3]

For the entire economy, these symptoms indicate that economic growth is being retarded and welfare is not at a maximum. The production of the agricultural sector is greater than will be consumed in other sectors at an acceptable price to farmers. For this reason, the return to farm labor is less than the return to labor in other employment. Further growth may be retarded because of this underutilization of physical and human resources in agriculture.

There are several explanations offered as to why indicated adjustments have not been made within agriculture and between agriculture and other segments of the economy. Those who advocate a free marekt economy have argued that government programs and policy, especially the price support and acreage control programs, have interferred with the operation of the price system in guiding the indicated adjustments. They reason that these programs have caused resources to remain in agriculture rather than moving into other segments of the economy where society would place a higher price on their services.

Other explanations for lack of adjustment include:

1. Family ties and the desire for rural life have caused many farmers to remain in agriculture at a low level of income.

2. Lack of information as to available employment alternatives and

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[3]James S. Plaxico and John W. Goodwin, "Adjustments for Efficient Organization of Southern Farms," Summary of Papers Presented at a Seminar for Southern Agricultural Leaders, Series One, Agricultural Policy Institute, North Carolina State College, Raleigh, January, 1961.

lack of these within a reasonable geographic area have impeded movement off the farm.

3. National economic conditions and unemployment have intensified competition for available jobs.

4. Lack of education and training in nonfarm skills has made it impractical for some farmers to find employment elsewhere.

5. Capital limitations have prohibited some farmers from taking full advantage of technical advancements for more efficient on-farm resource use.

Adjustment Potential

The rapid development and adaptation of technology in agriculture is one of the causes of the farm problem today. Technology in agriculture has advanced so fast that food output is increasing more rapidly than can be absorbed by growth in population and income. Furthermore, when a nation is well fed, increases in income are not apt to be spent on food. If food expenditures are increased, they are for better food or more services and not for a larger quantity of food. Therefore, with a bountiful production, agricultural income may decrease total and per capita, while other segments of the economy enjoy an increasing income. Essentially, this means that the consuming public, through the price system, is saying that it desires more nonfarm goods and less farm goods. This suggests the desirability of shifting resources from agriculture to nonfarm production.

Clearly, adjustments could be made in the economy which would increase the rate of economic growth and improve welfare. Moving labor

from agriculture to other employments would increase the incomes of people concerned. Also, the incomes of people remaining in agriculture could be increased, if those remaining realign the resources into larger producing units. This adjustment has been taking place at a rapid rate in the past, as shown by the steady decrease in the number of farms and farm population and the increase in farm size over the last half century. However, the rate of adjustment apparently needs to be accelerated if resource returns between industries are to be equated.

Statement of the Problem

Agriculture over the past several years has faced the problem of overproduction and comparatively low aggregate and individual income. Programs have been initiated to support prices of many agriculture commodities and to restrict production by controlling the acreage planted. However, the low income problem still exists in agriculture.

For the economy, overproduction in agriculture and under-utilization of resources means that the rate of economic growth and the welfare of the nation is being retarded. To increase farm income and accelerate economic growth of our society, agricultural policies should be established to expedite resource adjustments between agriculture and other sectors of the economy.

These policy proposals need to be evaluated within the context of an efficiently organized agriculture. Even though our economy is dynamic, a static evaluation of an efficient structure of the agriculture economy will give some insight into the magnitude and direction of the desired adjustments.

How much labor should be transferred? How many farms could there be if farm incomes were raised to a specified level? What quantity of the various resources are needed for these farms and a reorganized agriculture? What combination of resources would maximize profits and what aggregate output would be produced? Such questions need to be answered if a sound program is to be initiated to expedite adjustments. This study is designed to provide answers to some of these questions for a specific geographic area. This, with research from other areas, will suggest some of the implications of adjustment for the economy, for areas, and for individual farmers.

The Objectives Of The Study

In this study, estimates of the magnitude of changes required in the agricultural sector of a specific area to achieve specified returns are made. The analysis is a normative one[4] to determine the quantity of resources farmers within the area would need to bring their income to a level comparable with that of persons employed in nonfarm work.

The specific objectives of this study are:

1. To determine the minimum resources required (land, labor, and capital) to obtain specified returns to farm operator, labor and management in the Low Rolling Plains of Southwestern Oklahoma,

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[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 decision-makers 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,

3. To determine the number of farms within the area consistent with these levels of income, and

4. To determine the aggregate output and resource use if these levels of income are obtained.

Description of the Area

The geographic area to which this study applies is designated as Economic Area 4 in Oklahoma by the 1954 Census.[5] This area is a part of the Low Rolling Plains of Oklahoma and is specifically the 11 county area of Oklahoma as shown in Figure 1. It is a part of the soil classification area known as the Rolling Red Plains of Kansas, Oklahoma, and Texas.

The soil features describe the relevant characteristics of the area. The gently sloping soil may have lime deposits within 36 inches of the top, whereas 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.[6]

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.

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

[6] Fenton Gray and H. M. Galloway, Soils of Oklahoma, Miscellaneous Publication MP-56, Oklahoma Agricultural Experiment Station, July, 1959.

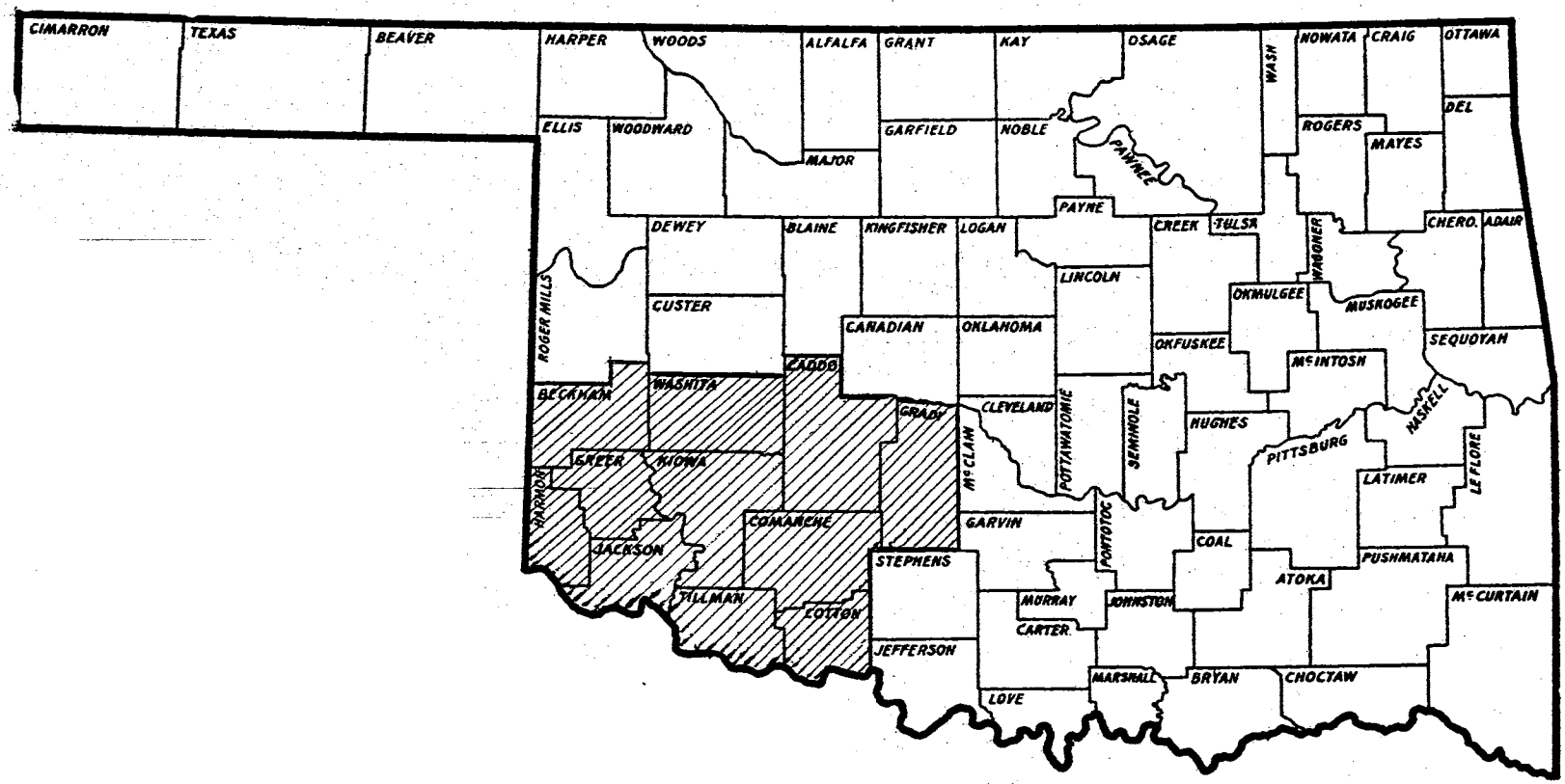

Figure 1. Map of Oklahoma with the shaded area showing the eleven counties of the Low Rolling Plains of Southwestern Oklahoma which are included in the area of the study.

The growing season ranges from 190 to 225 days. Water erosion is a serious problem on sloping areas. Wind erosion is a problem, especially on cultivated sandy soils not covered with a winter cover crop or a mulch.

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 sand (S). Each of these soil types is found in abundance throughout the area. Each soil type is considered separately in this analysis. In addition to a division by major soil types, each type has been divided into productivity classes on the basis of topography and depth of the top soil. These classes are referred to here as a, b, c, d, and e, with "a" being the most productive soil.

The clay (or claypan) soils, as defined in this study, are both fine and medium textured soils with very slowly permeable subsoils. Because of the tightness of the topsoil, no clay soil has been designated as productivity class C_a. The productivity classes for clay soils are: C_b, C_c, C_d, and C_e. These soils as defined are usually identified on a soils classification map as Foard and Tillman series or their equivalents. The soils are adapted to the production of cotton, wheat, oats, and feed hay and pasture for livestock. The definitions of the productivity classes and the estimated yields for various crops on clay soils are shown in Appendix A, Table I.

The loam soils are medium textured soils with moderately permeable subsoils. There are five productivity classes for loam soils: L_a, L_b, L_c, L_d, and L_e. Loam soils are usually shown on a soils map as

Upland-Tipton, St. Paul, Carey, Bottomland-Spur, and Canadian series with some Quinlan and Vernon series or their equivalents. Because loam soils are found frequently within the area in two different phases, these phases have been separated for this study.

The L_1, or level loam phase, is predominately level bottomland soil. This phase has a high percentage of productivity class L_a soil and a very small percentage of the lower productivity classes of the loam soils. The L_2, rolling loam phase, is found mostly in the upland area. It has a small percentage of productivity class L_a soil and a high percentage of the lower productivity classes of the loam soils. The loam soils are well adapted for the production of cotton, wheat, grain sorghum, hay and grazing crops. The definitions of the productivity classes and the estimated yields for various crops on loam soils are shown in Appendix A, Table II.

The sandy soils are coarse in texture with very highly permeable subsoils. Because of the wind erosion hazard, no sandy soil was classified in productivity class S_a. These soils are usually shown on a soils map as Miles, Dill, Pratt, or Enterprise sandy soils or their equivalents. The sandy soils are well adapted to the production of cotton, wheat, grain sorghum, alfalfa and other hay and grazing crops. Wind erosion practices of planting winter cover crops or mulching must be followed on cultivated land for substantial high level yields. The definition of the productivity classes and estimated yields for various crops on sandy soils are shown in Appendix A, Table III

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 in which soil resources are suited primarily for native pasture and grazing. Therefore, adjustment to crops would be impractical.

Grade A dairying was not considered as an adjustment possibility because of the limited market for milk. Other alternatives which were excluded because of limited adjustment possibilities included vegetable farms, fruit and nut farms, specialty crop farms and poultry farms. Irrigated land was also excluded from consideration in this study.

On the basis of available information,[7] the total land in the area was divided into four major soil types and subdivided into the soil productivity classes. The excluded land uses described above were also divided into the various categories and were subtracted from the total land area. The total number of farms and the number of excluded farms in the area were determined and divided as to the four soil types. The total land in the area and the included acres and farms are shown in Table I.

The area of the study 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

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[7] U. S. Census of Agriculture, 1954 and 1959, A.S.C. records for the area, studies by soil scientists, and a personal survey of sample farms within the area.

TABLE I

TOTAL FARMS, TOTAL LAND IN FARMS, INCLUDED FARMS AND INCLUDED ACRES IN FARMS FOR THE LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA AS DISTRIBUTED BY MAJOR SOIL TYPES AND MAJOR SOIL PRODUCTIVITY CLASSES

Soil Productivity Classes	Major Soil Types							
	Level Loam		Rolling Loam		Sandy		Clay	
	Total Acres	Included Acres	Total Acres	Included Acres	Total Acres	Included Acres	Total Acres	Included Acres
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	605,001	510,168	365,280	750,766	537,548	1,090,572	780,850
Native Pasture	274,842	117,083	591,271	251,881	588,375	250,648	696,110	296,543
Total Acres	1,119,716	722,085	1,101,439	617,160	1,339,141	788,196	1,786,682	1,077,392
Number of Farms	3,547	2,360	3,434	1,771	4,581	2,683	4,498	2,449

livestock and grain terminals so that an organized market is available for the agricultural products produced.

Most of the labor used is family labor, but labor within the area is fairly abundant for agricultural work. Some outside labor, mostly migratory Mexican labor from Texas and Mexico, is available to the area for cotton chopping and harvesting work. Most of the wheat harvesting is done by custom combine crews who follow the harvest throughout the Great Plains wheat belt.

Previous Research on Problem

There has been only a limited amount of previous work done in the field of this study. Brewster[8] conducted a pilot study to determine the farm resources needed for specified incomes to farm operator labor and management for specified types of farms in six locations in the United States.

The major purpose of much of the previous work in this field has been to explain the problem and to establish a methodological framework for making such studies. The North Central Farm Management Research Committee in 1957 discussed aspects of the current farm problem. The basic problem area was defined as a need for adjustment in resource use, especially labor. A need was expressed for research of the nature of this study before any definite policy could be formulated. The papers and discussions of this conference have been published by the Iowa State University Press.[9]

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[8]John M. Brewster, Farm Resources Needed for Specified Income Levels, Agriculture Information Bulletin No. 180, Agricultural Research Service, U. S. Department of Agriculture, December, 1957.

[9]Earl O. Heady, et al., (ed.) Agricultural Adjustment Problems in a Growing Economy, The Iowa State College Press, 1958.

Brewster, of the United States Department of Agriculture, wrote a preliminary draft of the research methods to be used by that agency to make such a study. He outlined some of the basic assumptions and a general framework of the model to be used in the study. He presented basically the same material to a conference of the Southern Farm Management Committee in 1957.[10]

In 1960, Plaxico and Goodwin presented a paper at a Seminar for Southern Agricultural Leaders.[11] This paper compared the minimum resource requirements for specified incomes on fine textured soils of Southwestern Oklahoma, the Delta region of Arkansas, Mississippi and Louisiana, and a region of North Carolina, under various product prices and institutional restrictions. The model and many of the assumptions of the present study were based on the work done by Plaxico and Goodwin.

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[10] John M. Brewster, "Analyzing Minimum Resource Requirements for Specified Income Levels," Farm Size and Output Research, Southern Cooperative Series Bulletin No. 56, June, 1958, pp. 95-104.

[11] Plaxico and Goodwin, Summary of Papers Presented at a Seminar for Southern Agricultural Leaders.

CHAPTER II

CONCEPTUAL DEVELOPMENT

Traditional economic theory has generally conceded that each individual is a rational decision-maker whose primary purpose in producing any good is to maximize profits from the utilization of the resources which he controls. Profits are usually measured in monetary terms. Hicks states:

> The enterprise (the conversion of factors into products) may be regarded as a separate economic unit, detached from the private account of the entrepreneur. It acquires factors, and sells products; its aim is to maximize the difference between their value. In addition to factors acquired on the market, an enterprise may also make use of factors provided by the entrepreneur himself. If these factors are such that they could be sold (if not employed in the business) then their market prices must be debited to the costs of the enterprise. If, however, they cannot be used in any other way than in the business, they do not give rise to cost, and need not, (indeed cannot) be reckoned on the debit side of the firms account.[12]

Heady states that economics deals with choice between alternatives that arise when resources are limited and alternative uses can be made of them.[13] He further states that as a science of choice between alternatives, economics is based on maximizing and minizing conditions. Economics is concerned with choices which maximize the utility or satisfaction of consumers, the conditions which must exist if business

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[12] J. R. Hicks, Value and Capital, 2nd Edition, Oxford University Press, Ames House, London, 1946, p. 79.

[13] Earl O. Heady, Economics of Agricultural Production, Prentice Hall, Inc., New York, 1952, pp. 3-6.

profits are to be maximized, or as a corollary, the conditions which must exist if a given amount of profit or product is to be produced at a minimum cost.

Recently, economists have raised questions as to whether profits are actually maximized and what criterion does in fact guide decision-makers. Papandreau[14] has given a summary of some of these thoughts. He points out that the assumption of profit maximization rests on the same grounds as the assumption of utility maximization.

Rationality is consistent with things other than maximum profits. When we can draw a distinction between profit maximization and utility maximization, we can then distinguish between profit maximization and efficiency. Efficiency also relates to rationality and it implies the maximizing of ends with a given set of means or minizing means for a given set of ends. Efficiency is implicit in profit maximization, but efficiency may not imply profit maximization.

Papandreau further points to Higgins'[15] work in classifying the desires or forces which lead to solutions other than profit maximization into three categories: those which lead to production below the profit maximizing output (desire for leisure, etc.), those which lead to output above the profit maximizing level (desire for large firms, power, prestige, etc.), and those which make a firm stay where it is, whether

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[14] Andrew G. Papandreau, "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, pp. 189-219.

[15] Benjamin Higgins, "Elements of Indeterminancy in the Theory of Non Perfect Competition," American Economic Review, September, 1938, pp. 468-479.

above or below the profit maximizing level of output (desire for status quo, reluctance to change, etc.).

Papandreau further argues that profit maximization is based on the assumption of perfect knowledge. When dynamic and uncertainty considerations are introduced, we must recognize that expectations are not single valued. We are then generally forced to substitute preference-function maximization for profit maximization in our analysis.

White[16] has shown the problems of clearly defining profits. He asserts that much confusion concerning profit-maximizing goals in economic theory could be eliminated if economists would specify the implicit assumptions of their model and the extent to which they approach reality.

He further states that more fundamental than profit maximizing is the goal of survival of the firm. Once a firm is in operation, survival is often associated with maintaining the status quo. This desire to survive and to remain as stationary as possible would be revealed in the action of the firm. A thriving firm usually compares its present position and performance with the past performance of the firm. The firm, in making decisions, tries to maintain its relative position in the industry in regard to sales and output.

White also points out other goals of firms and classifies them as external and internal goals. External goals are market goals, image creation, and power goals. Internal goals of a firm would be production goals, and financial goals.

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[16] C. Mitchell White, "Multiple Goals in the Theory of the Firm," Linear Programming and the Theory of the Firm, K. E. Boulding and W. A. Spiney (editors), The Macmillan Company, New York, 1960, Chapter 6.

Farmers may tend to maximize utility rather than profits. Several factors including profits give rise to utility from production. Therefore, if factors other than profits influence the behavior of farmers, then the enterprise combinations and level of resources for maximum utility could differ from that of maximum profits. Hurt[17] conducted a study considering four factors which he believed influenced the decision of farmers in a low-income area. These were knowledge, time, effort, and capital requirements. He then defended the proposition that, as a result of the influence of these factors on decision-making, the level of resource use for maximum utility was less than that for profit maximization on low-income farms.

Farm management studies indicate that over a wide range of production net returns to farmers increase with increases in farm size. Very little evidence has been presented contrary to the hypothesis that constant returns to scale are reached at a low level of production and maintained over a wide range of production. If this evidence is correct, then a farmer interested in operating the farm size and producing the output to yield maximum profits, could expand farm size to the limit of his management ability. Therefore, under the profit maximization assumption, the problem of small farms and under-utilization of resources in agriculture may not exist.

Since the problem does exist, some motive other than profit maximization must exist in farming, or institutional restrictions on capital, etc., have prohibited maximum adjustment. This leads to the hypothesis

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[17] Verner G. Hurt, "Capital Investment and Resource Adjustment on Individual Farms in the Ouachita Highlands of Oklahoma," unpublished Ph.D. dissertation, Oklahoma State University, May, 1961.

that farmers may have as a goal the obtaining of some income level which will provide a standard of living he will be satisfied to maintain. Farm production decisions are then made to obtain this income. However, other factors, such as capital limitations, lack of ability, desire for leisure, etc., may limit the farm production to a level below the specified minimum.

If profit maximization is not the primary consideration of farmers, upon what basis does a farmer decide what income level is to be obtained? Also, what are to be the bases of consideration for establishing the income goals for this study?

Three possible justifications for accepting income goals as a decision criterion are: (1) the income level maintains the "status quo," (2) the income level represents the "opportunity cost" of farming, and (3) the income level gives the maximum efficiency for the individual farm and for the economy.

Some persons are primarily interested in keeping their positions of importance or well being in the community. It may be they desire to maintain a certain standard of living and are not primarily interested in accumulation of assets. Others may wish to make the best income possible from the farm size they now own. They are not interested in or do not desire to incur the risk involved with the purchase of additional land. Either of these situations would be maintaining the "status quo." The level of income that a farmer would seek to maintain this status would be arbitrary and would probably differ for each individual.

In a full employment economy, there is competition between agriculture and other industries for the use of labor. Within each, there

are employees with varying training and ability. Varying wage levels usually differentiate the ability and training of employees. To make decisions between farm and nonfarm employment, one could view the nonfarm income to employees with equal ability and training as his, as an "opportunity cost" of farming. Thus, other things equal, the farmer would desire a return to his labor and management equal to the return to similar trained 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 would be attainable only when the marginal value productivity of resources are equal between each of the various uses of the resource. For farmers, this would mean that every farmer would seek an income equal to the "opportunity cost" of farming. Some farmers, finding they could not obtain this income from farming, would move into nonfarm employment. This adjustment would take place until all the farmers remaining in agriculture received a return to their labor and management equal to the return to similar labor in nonfarm employment.

The primary purpose of this study is to determine the minimum resources required to provide specified labor management return in a selected agricultural area. The study assumes an efficiently organized agriculture and the results are intended to indicate the needed adjustments for a more efficient economy. Therefore, the income levels used

in this study are designed to represent levels of "opportunity cost" of farming 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. Brewster[18] discusses some of the problems encountered in comparing farm income with nonfarm income. 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 laborers cannot obtain, and vice versa. These could include the enjoyment of being one's own boss, the pleasure of rural living and the leisure time available. Also farmers may benefit from farm produced food and other prerequisites. Real estate values may be such that farm housing costs are lower than urban housing.

Brewster[19] states:

> Ideally speaking, the income levels most appropriate to use for our problem are industrial workers earnings asjusted for differences in the purchasing power of money, cost of living, and values of nonmoney incomes items so that any given level would represent equivalent quantities of want satisfying goods in both farm and nonfarm modes of life.

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[18] Brewster, "Analyzing Minimum Requirements for Specified Incomes," p. 97.

[19] Ibid.

The average wage of nonfarm employment varies greatly within and between different types of industry. Within each industry there are highly trained and skilled labor receiving above average wages and employees of lesser training and skills receiving below average wages. Also as the skill and training required in the industry decrease, the average wage for that industry decreases.

To be useful to individuals and to policy makers, the income levels chosen must represent the returns which are attainable at these different levels of skill for nonfarm employees. The returns must represent the average nonfarm income so that policy makers will have some guides as to needed adjustments to give a more efficient economy.

CHAPTER III

OPERATIONAL MODEL

Method of Analysis

The operational model for this analysis is developed within the general framework of the linear programming technique.[20] The objective is to maximize or minimize a function subject to some restraints, which may be either equalities or inequalities. It can be applied to a problem only when three conditions exist. These are (1) there must be a definable objective, (2) there must be a finite number of alternative methods or processes for obtaining the objective and (3) there must be some restrictions on resources or requirements to be met.[21]

The linear equations are derived from the assumption that input-output coefficients and prices paid for resources or received for products are constant. The inequalities arise from the fact that we wish to determine a plan which (a) may use but does not require using the

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[20]Several references are available on Linear Programming. See Earl R. Swanson, "Programming Optimal Farm Plans," Farm Size and Output Research, Southern Cooperative Series Bulletin Number 56, June 1958, Robert Dorfman, Application of Linear Programming to the Theory of the Firm, University of California Press, Berkley, 1951, Robert Dorfman, Paul A. Sameulson, and Robert M. Solow, Linear Programming and Economic Analysis, McGraw-Hill Book Company, New York, and Earl O. Heady and Wilfred Candler, Linear Programming Methods, Iowa State College Press, Ames, Iowa, 1959.

[21]Heady and Candler, p. 2.

entire supply of the available resources and (b) guarantees that the amount of any activity or commodity produced will be equal to or greater than zero.[22]

The specific assumptions of linear programming are linearity, additivity, divisibility, and finiteness.[23] Linearity implies that the ratios between all inputs and between inputs and product are fixed, hence independent of the level of use of the process or activity. This, in essence, implies constant returns to scale.

Additivity implies that with the use of two or more processes, the total production is the sum of the product of the individual processes, and the total resource requirement is the sum of the resource requirement for the individual processes used. Divisibility means that all non-negative levels of the given process are possibilities. Neither processes nor resource requirements are required to take on integral values and may come into the optimum program at any fractional level. The assumption of finiteness means there is a finite number of processes; only a relatively few of the possible processes are considered as possibilities.

Within the framework of these assumptions, the individual is assumed to seek some income target say b_k from the use of the minimum amount of resources. The individual owns some of the resources that are used in production, so that b_i $(i \neq k)$ is the quantity of the i^{th} resource controlled by the individual. Then

(3.1) $B = (b_1\ b_2, \ldots, b_m)$

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[22] Ibid., p. 5.

[23] Ibid., p. 8.

is a vector of the quantities of resources and the income target. The controlled quantity of the resources may or may not be enough to allocate to the productive processes and obtain the desired income target. Therefore, processes are included in the system whereby the individual can buy more resources to obtain the income target.

Any resource utilization or enterprise combination will give a solution of the system

(3.2) $AP' \leq B'$

(3.3) $P \geq 0$

where the vector

(3.4) $(P = P_1, P_2, \ldots, P_n)$

denotes the productive processes or enterprises the individual considers in allocating resources and organizing the operation to produce the specified income target.

Any productive process, P_j, will require some quantity of the i^{th} resource, b_i, as well as producing some net income (positive or negative) to satisfy the income target b_k. Let this quantity be denoted by a_{ij}. Then

(3.5) $A = (a_{ij})$

is a matrix of size m x n specifying the requirements of each of the resources by each of the processes. m = number of restrictions and n = number of processes.

There are an infinite number of combinations of activities, each a solution to the above system, (equation 3.2). Therefore some criterion must be established to select the optimum combination. The

optimum combination of enterprises would be the combination which would produce the specified income with the minimum total cost for the resources required.

A two-dimensional model showing the theoretical application[24] of the minimizing criterion is shown in Figure 2. In this figure, land resource is shown on the Y axis and all other resources are shown on the X axis.

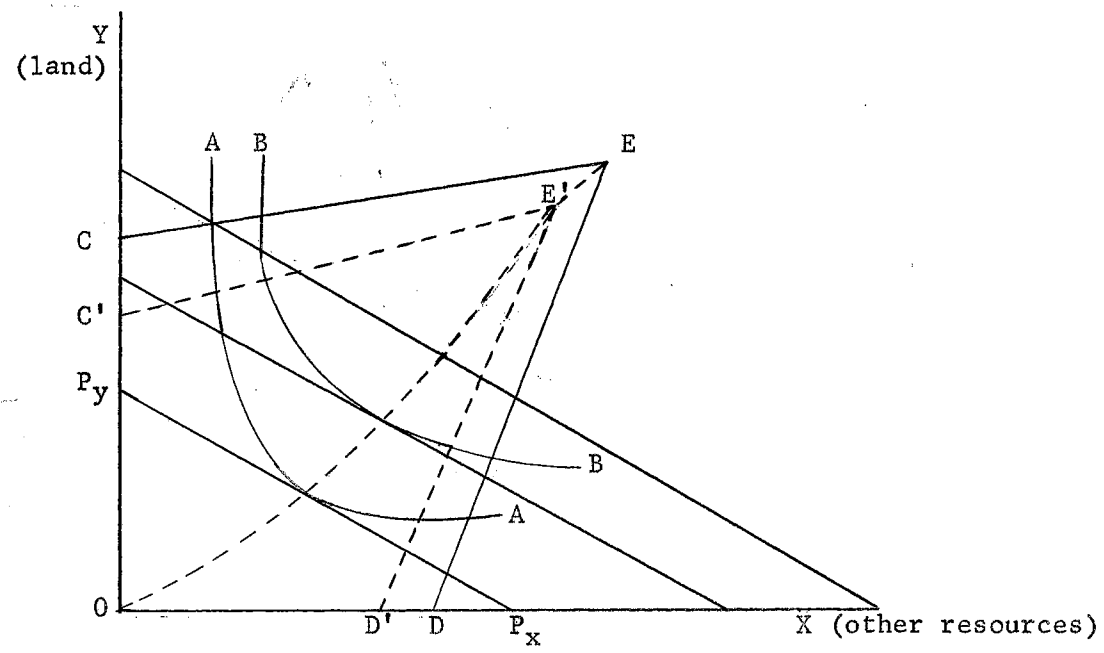

Figure 2. Illustration of Cost Minimization

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

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[24]See Heady. Economics of Agricultural Production and Resource Use, Chapter 6.

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_y P_x can be constructed. This line shows the 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, in making estimates of prices and production coefficients without perfect knowledge, some error could be introduced into the final solution. This difficulty of estimation, especially for the land price of the area, causes some reservation as to the reliability of the solution when using the minimum cost criterion.

It is possible to use other criteria which minimize any of the individual resource requirements. These include (1) minimizing the labor requirement, (2) minimizing the capital requirement and (3) minimizing the land requirement. Within the area, labor is already at a surplus. Thus, minimizing the labor requirement does not seem

a practical criterion. 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 are equal to the price of the resources, or 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.

In the researchers opinion, the substitution ratio or iso-product lines for land and other resources would be relatively steep. Therefore, the actual least cost expansion path would be nearer the pseudo-scale line for other resources (D'E') than to the pseudo-scale line for land (C'E). There will be some bias in using the minimum land criterion but the magnitude of this bias depends on the ratio between the price of land and the prices of other resources. It is felt that because of the difficulty of estimating land price, the final solution will have less bias by using a minimum land criterion than by using a minimum cost criterion.

Minimizing the land requirement was chosen as the criterion for this study. This criterion seems feasible because:

1. It should eliminate some of the error involved in estimating a specific price for land.
2. The solution will be approximately equal to the solution for minimum capital criterion.
3. If the assumed price and substitution ratios are correct, the minimum land solution approaches the "true" least-cost expansion path.
4. It is believed that less bias will be introduced in the solution than would be introduced if the land price estimates are used to estimate the 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 more steep, and move the pseudo scale line, D'E' along which the model expands nearer the assumed true least-cost expansion path.

The technique of the model is to minimize the land requirement function

$$(3.6)\quad L = CP'$$

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 shows 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

Land and Allotment Restrictions

A separate analysis will be made for each of the four specified soil resource situations; Clay, Level Loam, Rolling Loam, and Sand. The assumption is made that each analysis represents the distribution of the land productivity classes for the soil situations of the entire area; e.g., the total land area in each soil situation is determined as having a certain percentage of each productivity class. The model is constructed so that each acre of land contains this percentage of each productivity class for each soil situation.

Since cotton and wheat are under allotment programs, the current acreage allotments (as determined from a sample survey of farms and the State A.S.C. office records) are used in the analysis. For each soil type, the acreage allotment is converted to a percentage of the cropland. Each acre of land in each soil type is considered to have this percentage allotment for cotton and wheat. The specific assumptions as to land productivity class and acreage allotment distribution for each of the four soil types are shown in Table II.

TABLE II

THE PERCENT OF EACH SOIL PRODUCTIVITY CLASS AND ACREAGE ALLOTMENTS FOR ONE ACRE OF LAND BY SOIL TYPES, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA AS SET UP FOR THE MODEL OF THIS STUDY

Soil Productivity Class	Soil Type			
	Level Loam	Rolling Loam	Sandy	Clay
		- Percent -		
a	43.75	10.42	0.00	0.00
b	27.08	19.27	19.53	28.12
c	6.25	23.44	35.94	28.75
d	0.00	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

Price Assumptions

The product prices used in the study are estimates of the 1961 prices received by farmers in the area (Appendix B, Tables I and II). 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 by an average seasonal fluctuation factor, is used to estimate the price of alfalfa hay at harvest time in 1961. Other prices are estimated from current marketing 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 B, Table III).

The land prices used in the study are the current 1961 estimates for land transactions in the area. These prices were derived by comparing information on land sales with valuations from farm appraisers in the area. A summary of recent 1960 sealed bid sales of Indian farm land within the area was also used in estimating the price.

The land price used for each soil type is a weighted average price which reflects the typical acre for the area included in the study. That is, each acre is assumed to have the same proportion of all productivity classes of soils as was determined for the area. The figure was obtained by first determining the current selling price or valuation for each productivity class in each of the soil types. This rate was then multiplied by the percentage of this productivity class land which would be considered in the typical acre of this type land.

The price per acre is the sum of the values of the different productivity classes of soil included in the acre of land.

The price given for an acre of land is assumed to include any service buildings, but does not include any value for a dwelling. Also excluded are mineral rights and other nonagricultural use values.

The value per acre of sandy soil may appear low in relation to the assumed crop yields. However, the yield values used on sandy soils assume a high degree of technological advancement in soil fertilization and soil management. These practices have been generally recommended for only a few years and have not been adopted by farmers on a scale sufficient to significantly increase the average yield for sandy farms. Therefore, the current price per acre of sandy soils does not reflect the impact of the increased yield possibilities of sandy soil. It is probable that, as practices assumed in the yield projections are adopted by farmers on sandy soils, the price per acre will increase.

For this study, the analysis is made with four variations in land prices: (1) current price for each soil, (2) 25 percent below, (3) 25 percent above, and (4) 50 percent above current price. Three labor price levels also programmed are: (1) current prices, (2) 50 percent above, and (3) 100 percent above current price.

Both land and labor prices are difficult to estimate for an entire area. Also, these prices could be expected to change over a period of time. The future expectations of land price behavior may vary, whereas wage rates generally are expected to increase in the

future. Even if the estimated current price for land and labor are subject to error, some notion of the effect of future price changes can be gained by varying the price around the estimated current level.

Technological and Management Level

Machinery used on farms today is much improved and advanced over the machinery used ten years ago. For most crops, new varieties have been introduced which give higher yields. New techniques of production, new fertilization practices, and new soil conservation methods have been introduced by agricultural experiment stations and other agencies. However, the adoption of improved technology on farms has lagged. Since the objective is to determine the most efficient organization of farms in an area to give specified income levels, the technology assumed for this study is the optimum level of technology available.

Capital

In the model it is assumed that operating capital for purchasing cows, feeders, machinery, etc., can be obtained at an interest charge of six percent per year. The capital requirement for land investment is charged at a rate of five percent per year.

There is usually some limit on the amount of capital which can be controlled by an individual. This is usually based on the equity of that individual. However, the primary interest of the study is to determine the total resource requirements to obtain the levels of income and not the methods of controlling the capital. The level of income is determined as a return to operator labor and management.

Therefore, even if the farmer owns the capital, some charge must be placed on its use to estimate the return to operator labor and management.

The interest charges are made to reflect assumed market rates for capital. The six percent charge is approximately the rate charged by lending agencies in the area for short term operating loans. The five percent charge is approximately the rate charged by the Federal Land Bank for farm purchase loans.

The model was designed to determine the total amount of capital necessary to operate the farm, but to charge interest only on the amount of annual capital used. For example, if fertilizer were used in planting cotton, the total amount of capital required would be the total cost of the fertilizer. Since the fertilizer would be used when planting the crop in May, and then paid for when the cotton was sold in October, interest would be paid for only seven months. Hence, the actual interest would be equivalent to paying a full year's interest only on seven-twelfths of the total capital. Therefore, the annual capital requirement for the fertilizer would be seven-twelfths of the total capital requirement. If the capital had been used for the entire year, total capital and annual capital would have been the same.

Tenure

The farm tenure situation assumed is that of an owner operator. Although many farmers within the area own a quantity of land and rent or lease more land to complete the farm operation, this study is concerned with the quantity of resources required to obtain a level of

income, not with how the operator obtained control of the resources. In a long-run competitive situation, land rents would be expected to approach the ownership cost of the land. Therefore, the requirement of a five percent return on land investment should approximate the "rent cost" of rented or leased land. Thus, the analysis should give approximately the same results regardless of the tenure situation.

Labor

Although the operator is assumed to work on the farm throughout the year, it may be necessary to hire additional labor during periods of peak work loads. The labor that the operator is able to perform in actual production chores will be reduced by the amount of time required for management duties.

The farm operator is assumed to work at actual farm labor for a total of 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.

In periods when labor requirements are high, the operator is assumed able to hire additional labor. The current rate assumed ($1.00 per hour) is approximately the rate for farm labor in the northern part of the area, but slightly higher than the present rate in the southern part of the area. Some work hired for less than this rate has been placed on a custom-hired basis, e.g., cotton chopping is charged at a rate of $2.50 per acre with four hours per acre as the estimated labor requirement for this task.

Machine harvesting of crops has been budgeted on a custom-hire basis at the current 1961 custom rate in the area. This rate usually includes the wages paid to the machine operator. On the larger farm, it might be more economical for the operator to own the harvesting equipment; in these instances the labor requirements for harvesting have not been included in the budgets. However, the custom-hire rate charged will be high enough to make the calculation for operating capital include both the cost of the machinery and the operating cost of gas, oil and labor for the operation.

The analyses for the higher labor prices are made without considering corresponding increases in contract prices. However, this will not significantly alter the program optimum because labor (except for cotton chopping) is only a small portion of the contract charges. Furthermore, no parallel increases are made in custom chopping rates when labor prices are increased. This procedure is justified because farmers now have the alternative of chemical or mechanical control of weeds at approximately the same or only slightly higher costs than hiring cotton chopped by hand. Thus, if the rate for cotton chopping increases substantially, farmers would probably substitute chemical and mechanical weed control for cotton chopping labor.

Machinery

Based on usual practices in the area, 4-row equipment is assumed for all operations (Appendix B, Tables IV, V, and VI). Preliminary analysis indicates a maximum of approximately 700 acres total land or 550 acres cropland could be operated by one 4-row tractor. This

acreage would give the minimum machinery investment per acre for any size farm. For farms with more than 700 acres total land, the operator is assumed to add the needed machinery at this minimum investment per acre.

Machinery is a lumpy input, and a continuous function of machinery investment per acre may not be possible. However, machinery wear and depreciation depend to a large extent on the use of the machinery. A farm operation which requires more than one tractor, but less than the full use of two tractors, probably will have two tractors. The tractors probably will be depreciated over a longer period and kept on the farm longer than a fully utilized tractor. Another alternative will be to buy a used tractor when a second tractor is needed. In either case, over a long period, the machinery investment pattern for the farm operation may approximate the smooth pattern assumed above.

Since the objective is to determine the minimum acreage required, the machinery assumption for each income level is made by trial and error. If preliminary estimates indicate that the income goal can be reached with a minimum of less than 700 total acres, a single set of machinery is assumed for the model. If the minimum acreage is expected to be larger than 700 total acres, the machinery investment is assumed to be a fixed sum per acre.

The salvage value for all equipment is figured at 12 percent of the new value. This salvage value is subtracted from the new value of the machinery and the remainder depreciated over 10 years on a straight-line basis. Interest is charged on machinery investment at a rate of six percent of the average investment.

Overhead Cost

Some expenses of a farm operation must be included in total cost that are not included in the process budgets for the study. These expenses are grouped together into a category called overhead cost. These expenses included land taxes, pickup truck operation, telephone, bookkeeping and tax service, and insurance. Some of these expenses are associated with the size of the farm. Others vary with receipts and the discretion of the operator. However, all of the expenses are affected to some extent by the size of the operation.

Land taxes are charged at a fixed rate of $1.00 per acre. Other charges vary from farm to farm and as farm size increases. Telephone expense is an arbitrary figure. Cash insurance costs vary according to amount and types carried. Bookkeeping and tax service costs vary according to income and the type and accuracy of farm records kept by the operator. Pickup costs vary by the mileage driven, but are assumed to increase as farm size increases the mileage and wear on a truck. Three sets of the assumed expenses for each overhead item are shown in Appendix B, Table VII.

Since overhead costs are expected to increase to some extent with increases in farm size, the cost is converted to a rate of $1.25 per acre and charged at this rate in all programs in which the minimum farm size is over 700 acres.

Included Processes

The enterprises which are considered in the model must be limited to some extent because of the finite assumption of linear programming

and because of the limitation on storage space in the IBM computer. Budgets were made for the enterprises which were considered feasible and for which there was a sufficient market to permit these enterprises to be considered by all farmers as adjustment opportunities. These budgets are for enterprises which are, and can be, produced in abundance in the area. They include cotton, cash grain crops, grazing crops, hay, and cows and feeder enterprises. Budgets for the different soil types have been published.[25]

Alfalfa requires relatively fertile land with good moisture content to produce high yields consistently. The stand 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. Income from alfalfa is usually based on the

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[25] John W. Goodwin, James S. Plaxico, and William F. Lagrone, Resource Requirements, Costs and Expected Returns; Alternative Crop and Livestock Enterprises; Clay Soils of the Rolling Plains of Southwestern Oklahoma, Oklahoma Agricultural Experiment Station Processed Series P-357, in cooperation with Farm Economics Research Division, Agricultural Research Service, U. S. Department of Agriculture, Stillwater, Oklahoma, September, 1960.

Larry J. Connor, William F. Lagrone, and James S. Plaxico, Resource Requirements, Costs and Expected Returns; Alternative Crop and Livestock Enterprises; Loam Soils of the Rolling Plains of Southwestern Oklahoma, Oklahoma Agricultural Experiment Station Processed Series P-368, in cooperation with Farm Economics Research Division, Agricultural Research Service, U. S. Department of Agriculture, Stillwater, Oklahoma, February, 1961.

William F. Lagrone, Percy L. Strickland, Jr., and James S. Plaxico, Resource Requirements, Costs and Expected Returns; Alternative Crop and Livestock Enterprises; Sandy Soils of the Rolling Plains of Southwestern Oklahoma, Oklahoma Agricultural Experiment Station Processed Series P-369, in cooperation with Farm Economics Research Division, Agricultural Research Service, U. S. Department of Agriculture, Stillwater, Oklahoma, February, 1961.

production of hay, since alfalfa seed cannot be harvested consistently year after year. Therefore, the alfalfa hay and seed enterprise is not considered as an alternative. The alfalfa hay produced is assumed to be sold in the field at harvest time.

To produce consistently high grain sorghum yields would also require a high moisture content in the soils and rotation to control disease. 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.

The exclusion of any enterprise does not mean that it would not be profitable to utilize this enterprise on an individual farm. It only means that for the entire area adjustment, it would be impractical for all operators to use that enterprise on their farms.

Income Targets

In Chapter II, the general attributes of income goals needed in the study were discussed. Industries were selected which would represent highly skilled, skilled and semi-skilled 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 III). 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 would require, on the average, highly trained and skilled employees, whereas the wearing apparel industries would require little previous training of employees, and in most instances, represents secondary income (wives, etc.). The average

TABLE III

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. Department 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.

wage for all manufacturing industries in the United States in 1959 was $4,705.

In comparing nonfarm and farm incomes, some adjustments should be made for differences in real income. However, in the programming model, no provision is made for the farm operator to use land for a garden. All of the livestock or other products produced on the farm are assumed sold. Farm families probably would use some of these products, but this would decrease the cash income. The investment in land does not include a dwelling. Therefore, farm housing costs would be in addition to the estimated cost of the operation. Since there are no large urban developments within the area, the purchasing power of money should be about the same for farm and nonfarm people in the area. However, farmers moving off the farm probably would have to move to another area to find employment; there may be some difference in the purchasing power of money for the individual considering the alternative nonfarm employment. Although indications are that some adjustment should be made between farm and nonfarm income, no attempt has been made to enumerate specific adjustments made in these incomes.

Three levels of return to operator labor and management are estimated in this study. These are: $3,000, $5,000, and $7,000. To the individual farmer, these would represent approximately the return to semi-skilled, skilled, and highly skilled labor in nonfarm employment. From an economic efficiency standpoint, the $3,000 return might represent a minimal average farm return at present. The $5,000 return would represent approximately the present average return to nonfarm labor.

However, since the average nonfarm income is expected to continue to rise, the $7,000 return should be useful in analyzing the effect of future wage increases on the needed farm adjustments for maximum economic efficiency.

CHAPTER IV

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 each combination of four land prices and three hired labor prices. The program results provide estimates 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 C. Only the cropland and the total capital requirement are presented in this chapter. Since land investment is the largest part of the total capital requirement, the total capital requirement will vary almost proportionately with the land requirement. These results will be presented separately for each of the soil situations.

Clay Soils

$3,000 Return to Operator Labor and Management

With land and hired labor prices at the current level, the minimum cropland requirement to obtain a $3,000 return to operator labor and management on clay soils is 547 acres (Table IV). The total capital requirement is $110,826. With the hired labor price at $1.00 per hour, decreasing the land price to 25 percent below current price decreases the cropland requirement by 94 acres, or by 17.2 percent. Increasing the land price from current price to 25 percent above current price increases the cropland requirement by 97 acres, or by 17.7 percent. Increasing the land price from 25 percent above current price to 50 percent above current price increases the cropland requirement by 837 acres, or by 130 percent.

With land price at the current level, increasing the hired labor price from $1.00 to $2.00 per hour increases the cropland requirement by 56 acres, or 10.2 percent. With land price at 25 percent below current price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 29 acres, or by 6.4 percent. When the land price is 25 percent above current price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 343 acres, or by 53.3 percent. At a land price of 50 percent above current price, the income target can not be obtained when hired labor price is increased above the current level.

TABLE IV

ESTIMATED MINIMUM CROPLAND[a] REQUIREMENT TO OBTAIN SPECIFIED RETURNS TO OPERATOR LABOR AND MANAGEMENT, SPECIFIED LAND AND HIRED LABOR PRICES, CLAY SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Hired Labor Price	Requirement	Unit	Land Price Per Acre $78.75	$105[b]	$131.25	$157.50
$3,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	453	547	644	1,481
	Total Capital	dollars	78,573	110,826	150,031	389,802
$1.50	Cropland	acres	467	573	736	
	Total Capital	dollars	80,899	115,778	170,240	
$2.00	Cropland	acres	482	603	987	
	Total Capital	dollars	83,252	121,543	227,195	
$5,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	715	865	1,303	3,634
	Total Capital	dollars	120,646	161,962	298,896	958,491
$1.50	Cropland	acres	750	932	1,983	
	Total Capital	dollars	126,017	184,516	457,281	
$2.00	Cropland	acres	792	1,024	-	
	Total Capital	dollars	132,726	202,000	-	
$7,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	983	1,206	2,039	5,900
	Total Capital	dollars	163,610	237,132	468,358	1,556,840
$1.50	Cropland	acres	1,055	1,348	3,648	
	Total Capital	dollars	174,953	264,109	843,508	
$2.00	Cropland	acres	1,159	1,572	-	
	Total Capital	dollars	191,253	306,360	-	

No Solution

[a]Cropland is approximately 78 percent of total land.

[b]Assumed current price.

$5,000 Return to Operator Labor and Management

With land and hired labor at current prices, the minimum cropland requirement to obtain a $5,000 return to operator labor and management on clay soils is 865 acres. The total capital requirement is $161,962. With hired labor price at the current level, decreasing land price to 25 percent below current price decreases the cropland requirement by 150 acres, or by 17.3 percent. Increasing the land price from current price to 25 percent above current price increases the cropland requirement by 438 acres, or by 50.6 percent. Increasing the land price from 25 percent above current price to 50 percent above current price increases the cropland requirement by 2,331 acres, or by 179 percent.

With land price at the current level, increasing the hired labor price from $1.00 to $2.00 per hour increases the cropland requirements by 159 acres, or 18.4 percent. When land price is 25 percent below the current price, the cropland requirement increases by 77 acres or 10.8 percent as the hired labor price increases to $2.00 per hour. At a land price of 25 percent above current price, the cropland requirement increases by 680 acres, or 52.2 percent when the hired labor price increases to $1.50 per hour. At a hired labor price of $2.00 per hour, the income target cannot be obtained. With a land price of 50 percent above current price, the income target cannot be obtained when the hired labor price increases above the current level.

$7,000 Return to Operator Labor and Management

With land and hired labor prices at current levels, the minimum cropland requirement to obtain a $7,000 return to operator labor and

management on clay soils is 1,206 acres. The total capital requirement is $237,132. With hired labor price at the current level, decreasing land price to 25 percent below current price decreases the cropland requirement by 223 acres, or 18.5 percent. Increasing the land price from the current level to 25 percent above current price increases the cropland requirement by 883 acres, or by 69.1 percent. With an increase in land price from 25 percent above current price to 50 percent above current price, the cropland requirement increases by 3,861 acres, or 189 percent.

With land price at the current level, the cropland requirement increases by 366 acres, or 30.3 percent as hired labor price increases from $1.00 per hour to $2.00 per hour. At a land price of 25 percent below current price, the cropland requirement increases by 176 acres as the hired labor price increases. At the 25 percent above current land price, the increase in cropland requirement when the hired labor price increases to $1.50 per hour is 1,609 acres, or 78.9 percent. The income cannot be obtained when the hired labor price increases to $2.00 per hour. With land price at 50 percent above current price, the income cannot be obtained when the hired labor price increases above the current level.

Level Loam Soils

$3,000 Return to Operator Labor and Management

With land and hired labor prices at current levels, the minimum cropland requirement to obtain a $3,000 return to operator labor and management on level loam soils is 333 acres (Table V). The total

TABLE V

ESTIMATED MINIMUM CROPLAND[a] REQUIREMENT TO OBTAIN SPECIFIED RETURNS TO OPERATOR LABOR AND MANAGEMENT, SPECIFIED LAND AND HIRED LABOR PRICES, LEVEL LOAM SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Hired Labor Price	Requirement	Unit	Land Price Per Acre $180	$240[b]	$300	$360
$3,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	255	333	443	
	Total Capital	dollars	75,321	121,461	192,638	
$1.50	Cropland	acres	255	336	478	
	Total Capital	dollars	75,321	122,648	207,648	
$2.00	Cropland	acres	255	340	534	No Solution
	Total Capital	dollars	75,321	124,035	221,200	
$5,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	401	535	921	
	Total Capital	dollars	114,924	190,883	398,243	
$1.50	Cropland	acres	408	555	1,219	
	Total Capital	dollars	116,661	198,671	528,384	
$2.00	Cropland	acres	416	577	6,750	No Solution
	Total Capital	dollars	118,835	206,022	2,946,113	
$7,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	574	767	1,507	
	Total Capital	dollars	163,801	273,481	652,208	
$1.50	Cropland	acres	591	813	2,285	
	Total Capital	dollars	168,535	290,971	992,535	
$2.00	Cropland	acres	610	873	21,706	No Solution
	Total Capital	dollars	173,707	310,744	9,481,441	

[a]Cropland is approximately 78 percent of total land.

[b]Assumed current price.

capital requirement is $121,461. At the current hired labor price, decreasing the land price by 25 percent decreases the cropland requirement by 78 acres, or 23.4 percent. Increasing the land price from current to 25 percent above current price, increases the cropland requirement by 110 acres, or 33 percent. When land price increases to 50 percent above the current price, the target income cannot be obtained.

At the current land price, increasing the hired labor price from $1.00 per hour to $2.00 per hour increases the cropland requirement by 7 acres. At a land price of 25 percent below current price, no hired labor is required to operate the farm unit. Therefore, increasing the hired labor price does not alter the requirements. With land price at 25 percent above the current price, increasing the hired labor to $2.00 per hour increases the cropland requirement by 91 acres, or 20.5 percent.

$5,000 Return to Operator Labor and Management

With current land and hired labor prices, the minimum cropland requirement to obtain a $5,000 return to operator labor and management on level loam soils is 535 acres. The total capital requirement is $190,883. With the current labor price, the cropland requirement is reduced by 134 acres, or 25 percent, when land price is reduced by 25 percent. When land price increases from the current price to 25 percent above current price, the cropland requirement increases by 386 acres, or 72 percent. The desired income cannot be obtained with land price at 50 percent above the current price.

At the current land price level, the cropland requirement increases by 42 acres, or 12.6 percent when the hired labor price is increased to $2.00 per hour. At the 25 percent below current land price level, increasing the hired labor price to $2.00 per hour increases the cropland requirement by only 15 acres. With land priced at 25 percent above the current price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 5,829 acres.

$7,000 Return to Operator Labor and Management

At current land and hired labor prices, the minimum cropland requirement to obtain a $7,000 return to operator labor and management on level loam soils is 767 acres. The total capital requirement is $273,481. At the current hired labor price, decreasing the land price by 25 percent decreases the cropland requirement by 193 acres, or 25.2 percent. Increasing the land price from current to 25 percent above current price increases the cropland requirement by 740 acres, or 96.5 percent.

At the current land price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 106 acres, or 13.8 percent. With land price at 25 percent below current price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 36 acres, or 5.2 percent. With land price at the 25 percent above current price level, the cropland requirement increases by 20,199 acres when the hired labor price increases to $2.00 per hour.

Rolling Loam Soils

$3,000 Return to Operator Labor and Management

At current land and hired labor prices, the minimum cropland requirement to obtain a $3,000 return to operator labor and management on rolling loam soils is 691 acres (Table VI). The total capital requirement is $185,867. With the current hired labor price, decreasing the land price by 25 percent decreases the cropland requirement by 209 acres, or 30.2 percent. The desired income cannot be obtained when land price increases above the current price level.

With land price at 25 percent below current price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 32 acres. At the current land price, increasing the hired labor price to $1.50 per hour increases the cropland requirement by 235 acres, or 34 percent. The desired income cannot be obtained when the hired labor price increases to $2.00 per hour.

$5,000 Return to Operator Labor and Management

At current land and hired labor prices, 1,652 acres of cropland are required to give a $5,000 return to operator labor and management on the rolling loam soils. The total capital requirement for this return is $438,158. Decreasing the land price by 25 percent reduces the cropland requirement by 912 acres, or by 55.2 percent. The desired income cannot be obtained with a land price higher than the current level.

With land price at 25 percent below current price, increasing the hired labor price to $2.00 per hour increases the cropland requirement

TABLE VI

ESTIMATED MINIMUM CROPLAND[a] REQUIREMENT TO OBTAIN SPECIFIED RETURNS TO OPERATOR LABOR AND MANAGEMENT, SPECIFIED LAND AND HIRED LABOR PRICES, ROLLING LOAM SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Hired Labor Price	Requirement	Unit	Land Price Per Acre $127.50	$170[b]	$212.50	$255
$3,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	482	691		
	Total Capital	dollars	107,094	185,867		
$1.50	Cropland	acres	494	926	No Solution	No Solution
	Total Capital	dollars	108,870	233,808		
$2.00	Cropland	acres	504	-		
	Total Capital	dollars	111,226	-		
$5,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	740	1,652		
	Total Capital	dollars	158,569	438,158		
$1.50	Cropland	acres	784	4,172	No Solution	No Solution
	Total Capital	dollars	166,727	1,056,755		
$2.00	Cropland	acres	841	-		
	Total Capital	dollars	168,961	-		
$7,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	1,044	2,696		
	Total Capital	dollars	222,451	716,044		
$1.50	Cropland	acres	1,134	7,820	No Solution	No Solution
	Total Capital	dollars	240,624	1,998,159		
$2.00	Cropland	acres	1,260	-		
	Total Capital	dollars	264,771			

[a]Cropland is approximately 78 percent of total land.

[b]Assumed current price.

by 101 acres, or 13.6 percent. At the current land price, increasing the hired labor price to $1.50 per hour increases the cropland requirement by 2,520 acres. The desired income cannot be obtained when the hired labor price increases to $2.00 per hour.

$7,000 Return to Operator Labor and Management

At current land and hired labor prices, the minimum cropland requirement to obtain a $7,000 return to operator labor and management on rolling loam soils is 2,696 acres. The total capital requirement for this size of farm is $716,044. Decreasing the land price by 25 percent reduces the cropland requirement by 1,652 acres. The desired income cannot be obtained when land price is increased above the current level.

When land is priced at 25 percent below the current level, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 216 acres. At the current land price, increasing the hired labor price to $1.50 per hour increases the cropland requirement by 5,124 acres. The income cannot be obtained when hired labor price increases to $2.00 per hour.

Sandy Soils

$3,000 Return to Operator Labor and Management

With current land and hired labor prices, the minimum cropland requirement to obtain a $3,000 return to operator labor and management on sandy soils is 344 acres, (Table VII). The total capital requirement is $93,090. With a hired labor price of $1.00 per hour, decreasing the

TABLE VII

ESTIMATED MINIMUM CROPLAND[a] REQUIREMENT TO OBTAIN SPECIFIED RETURNS TO OPERATOR LABOR AND MANAGEMENT, SPECIFIED LAND AND HIRED LABOR PRICES, SANDY SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Hired Labor Price	Requirement	Unit	Land Price Per Acre $120	$160[b]	$200	$240
$3,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	281	344	392	896
	Total Capital	dollars	63,229	93,090	122,686	326,979
$1.50	Cropland	acres	282	349	413	No Solution
	Total Capital	dollars	63,404	94,405	131,333	
$2.00	Cropland	acres	283	356	442	
	Total Capital	dollars	63,585	95,875	139,971	
$5,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	476	589	825	2,245
	Total Capital	dollars	105,989	158,526	239,632	822,140
$1.50	Cropland	acres	489	621	1,068	No Solution
	Total Capital	dollars	109,040	166,999	336,044	
$2.00	Cropland	acres	503	665	2,557	
	Total Capital	dollars	111,971	177,512	802,577	
$7,000 Return to Operator Labor and Management						
$1.00[b]	Cropland	acres	656	823	1,308	3,629
	Total Capital	dollars	143,233	220,779	411,693	1,329,120
$1.50	Cropland	acres	691	896	1,912	No Solution
	Total Capital	dollars	150,440	237,198	603,690	
$2.00	Cropland	acres	732	997	6,056	
	Total Capital	dollars	159,073	261,317	1,928,130	

[a]Cropland is approximately 78 percent of total land.

[b]Assumed current price.

land price by 25 percent decreases the cropland requirement by 63 acres, or 18.3 percent. Increasing the land price from current price to 25 percent above current price increases the cropland requirement by 48 acres, or 13.9 percent. Increasing land price from 25 percent above current price to 50 percent above current price, increases the cropland requirement by 504 acres, or 128.6 percent.

At the current land price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 12 acres. With land price at 25 percent below the current price, the cropland requirement increases by only 2 acres as the hired labor price increases to $2.00 per hour. With land price at 25 percent above the current level, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 50 acres. With land priced at 50 percent above the current level, the desired income cannot be obtained when hired labor price increases above $1.00 per hour.

$5,000 Return to Operator Labor and Managment

With current land and hired labor prices, the minimum cropland requirement to obtain a $5,000 return to operator labor and management on sandy soils is 589 acres. The total capital requirement for this size of operation is $158,526. With hired labor price at $1.00 per hour, decreasing the land price by 25 percent decreases the cropland requirement by 113 acres, or 19.2 percent. Increasing the land price by 25 percent increases the cropland requirement by 236 acres, or 40.1 percent. Increasing the land price from 25 percent above current to 50 percent above current price increases the cropland requirements by 1,420 acres.

At the current land price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 76 acres, or 12.9 percent. At the land price of 25 percent below the current price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 27 acres, or 5.7 percent. With land priced at 25 percent above the current level, the cropland requirement increases by 1,732 acres when hired labor price increases to $2.00 per hour. With a land price of 50 percent above the current level, the income target cannot be reached when hired labor price increases above $1.00 per hour.

$7,000 Return to Operator Labor and Management

With land and hired labor at current prices, the minimum cropland requirement to obtain a $7,000 return to operator labor and management on sandy soils is 823 acres. The total capital requirement for this farm operation is $220,779. With hired labor at the current price, decreasing the land price by 25 percent decreases the cropland requirement by 167 acres or 20.3 percent. Increasing the land price from current to 25 percent above current price increases the cropland requirement by 485 acres, or 58.9 percent. Increasing the land price from 25 percent above current price to 50 percent above current price increases the cropland requirement by 2,321 acres.

At the current land price, increasing the hired labor price from $1.00 per hour to $2.00 per hour increases the cropland requirement by 174 acres, or 21.1 percent. With a land price of 25 percent below the current price, increasing the hired labor price from $1.00 per hour to

$2.00 per hour increases the cropland requirement by 76 acres, or 11.6 percent. At a land price of 25 percent above the current price, increasing the hired labor price to $2.00 per hour increases the cropland requirement by 4,648 acres. At a land price of 50 percent above the current price, the income cannot be obtained when hired labor price increases above $1.00 per hour.

Summary

The minimum cropland requirement to obtain any of the specified returns is fairly large on each of the soil types. A specified return of 5 percent is required for land investment in the program model. Therefore, any change in land price changes the investment in land and alters the results on each soil type.

On the other hand, the hired labor requirement 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. If there is a large hired labor requirement, changing the labor price will alter the results by a large amount.

For most of the soil situations, the size of farm required to obtain the incomes with land price at the current level or below, requires only a small quantity of hired labor for the operation. Therefore, increasing the hired labor price increases the requirements only slightly. At the higher land prices, increasing the hired labor price significantly increases the requirements.

It could be argued that the requirement of a five percent return to land investment is unrealistic, thus the requirements are over estimated. However, farmers control both the capital and labor employed on the farm. In nonfarm employment, one person usually controls and receives the return to capital. Another controls and receives the wages to labor. The farmer could invest his capital in nonfarm investment and work in nonfarm employment. By doing this, he would receive the return on his capital and the wages for his labor.

It might be felt that the five percent return to land investment is higher than the usual return to nonfarm investment. In the program solutions, the return to land investment with land price at 25 percent below the current price is the same as a 3.75 percent return to land investment with land price at the current level. By adjusting the figure for land investment, these requirements can be easily adjusted for a lower return to land investment.

The results indicate that with a 25 percent increase in land price on any of the soils, the requirements increase greatly. The technology level assumed in the study is the highest and most efficient presently known and not presently used on the average farm. This seems to indicate that farm land purchases are presently being evaluated not on the basis of present productivity and income possibilities, but on the basis of productivity and income possibilities of future periods. Thus, the present land price is, in reality, based on the future expectations of the land purchasers as to prices and technology.

CHAPTER V

IMPLICATIONS FOR ADJUSTMENT

If all farmers attempt to 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 the planted acreage of some crops in the area. These indicated adjustments in farm numbers and implications for resource adjustments are presented in this chapter. The indicated adjustments are shown only for the results programmed at current land and hired labor prices on each of the soil resource situations. The indicated adjustments in farm numbers for each combination of land and hired labor price are shown in Appendix D.

Minimum Adjustment in Farm Numbers

The present number of farms and the acreage of cropland in each soil type were determined from the preliminary data for 1959 Census of Agriculture and from a sample survey of farms within the area (see Table I). 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 types into the total acres of cropland of that soil type. 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 presently exists some farms which are already at or above the minimum acreage required to obtain the specified returns. Therefore, the minimum adjustment understates the actual adjustment which would be required, given the present farm-size distribution.

The present farm-size distribution was estimated for each of the soil types (Appendix D, Figures 1, 2, 3, and 4). The estimated number of farms which are presently above the required minimum size to generate the target income and the cropland acreage in these farms were subtracted from the total farms and total cropland acreage for each soil type. The remainder of the cropland was then adjusted into farms of the minimum size required to obtain the specified income. Therefore, given the present farm-size distribution, the number of farms which would be consistent with the desired return, would be the sum of 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 types. For the area, the number of farms would decrease by 3,928, or 42.4 percent (Table VIII). This would involve changing from 9,263 farms presently in the area to 5,335 farms.

The largest decrease in number of farms would occur on rolling loam soils. Presently there are 1,771 farms on this soil type. The

TABLE VIII

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	-	1,562	-1,122
Cropland	537,548	344	537,328	-
Percent change	-	-	-	41.8
Clay				
Number of farms	2,447	-	1,427	-1,020
Cropland	780,850	547	780,569	-
Percent change	-	-	-	41.7
Level Loam				
Number of farms	2,361	-	1,817	544
Cropland	605,000	333	605,061	-
Percent change	-	-	-	23.0
Rolling Loam				
Number of farms	1,771	-	529	-1,242
Cropland	365,280	691	365,539	-
Percent change	-	-	-	70.1
Area				
Number of farms	9,263	-	5,335	-3,928
Cropland	2,288,678	-	2,288,497	-
Percent change	-	-	-	42.4

number of farms consistent with $3,000 return would be 529 farms, for a required decrease of 1,242 farms or 70.1 percent. The smallest change would be required on level loam soils. On this soil type there are presently 2,361 farms. The maximum number of farms consistent with a $3,000 return would be 1,817 for a decrease of 544 farms and a percentage decrease of 23 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 IX). These farms include 976,665 acres of cropland. For the different soil types, the range is from 33 farms above the minimum requirement on rolling loam soil to 699 farms above the minimum requirement for level loam soil.

On each soil type the cropland in farms below the minimum size are assumed to adjust into farms of the minimum size required. For the area, a maximum of 2,891 farms would be possible on these resources. Therefore, by summing 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, would be 4,504 farms. This would be a decrease of 4,759 farms, or a 51.4 percent decrease.

The largest decrease again would be in rolling loam farms where a decrease of 70.4 percent in farm numbers would be required. The smallest decrease (41.2 percent) would be required on level loam soil.

TABLE IX

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	759	1,208	-1,239
Cropland	780,850	547	365,438	415,412	415,173	780,611	-
Percent change	-	-	-	-	-	-	50.6
Level Loam							
Number of farms	2,361	-	699	1,662	690	1,389	-972
Cropland	605,000	333	375,100	229,900	229,770	604,870	-
Percent change	-	-	-	-	-	-	41.2
Rolling Loam							
Number of farms	1,771	-	33	1,738	492	525	-1,246
Cropland	365,280	691	25,354	339,926	339,972	365,326	-
Percent change	-	-	-	-	-	-	70.4
Area							
Number of farms	9,263	-	1,613	7,650	2,891	4,504	-4,759
Cropland	2,288,678	-	976,665	1,312,013	1,311,715	2,288,380	-
Percent change	-	-	-	-	-	-	51.4

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 X). 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 farms to 221 farms. This would be a decrease of 1,550 farms and a percentage decrease of 87.5 percent. The largest absolute decrease in farm numbers would occur in sandy soil farms. Farm numbers on this type soil would have to be decreased from 2,684 farms to 913 farms. This would be a decrease of 1,771 farms and a percentage decrease of 66.0 percent.

The smallest reduction in farm numbers would occur in level loam farms. On this type soil, the number of farms would be decreased from 2,361 farms to 1,131 farms. This is a decrease of 1,230 farms and a percentage decrease of 52.3 percent.

Adjustment Assuming Present Size Distribution

There are presently 530 farms within the area with cropland acreage above the minimum requirement to yield a $5,000 return to operator labor and management (Table XI). These farms control 494,142 acres of cropland. These farms range from zero farms presently above the requirements to obtain the income on rolling loam soils to 285 farms above the minimum requirements to obtain the desired income on level loam soils.

TABLE X

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	-	913	-1,771
Cropland	537,548	589	537,757	-
Percent change	-	-	-	66.0
Clay				
Number of farms	2,447	-	903	-1,554
Cropland	780,850	865	781,095	-
Percent change	-	-	-	63.5
Level Loam				
Number of farms	2,361	-	1,131	-1,230
Cropland	605,000	535	605,085	-
Percent change	-	-	-	52.1
Rolling Loam				
Number of farms	1,771	-	221	-1,550
Cropland	365,280	1,652	365,092	-
Percent change	-	-	-	87.5
Area				
Number of farms	9,263	-	3,168	-6,095
Cropland	2,288,678	-	2,289,029	-
Percent change	-	-	-	65.8

TABLE XI

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 Type	Present	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	784	874	-1,810
Cropland	537,548	589	75,579	461,969	461,776	537,355	-
Percent change	-	-	-	-	-	-	67.4
Clay							
Number of farms	2,447	-	155	2,292	709	864	-1,583
Cropland	780,850	865	167,492	613,358	613,285	780,777	-
Percent change	-	-	-	-	-	-	64.7
Level Loam							
Number of farms	2,361	-	285	2,076	662	947	-1,414
Cropland	605,000	535	251,075	353,925	354,170	605,241	-
Percent change	-	-	-	-	-	-	59.9
Rolling Loam							
Number of farms	1,771	-	0	1,771	221	221	-1,550
Cropland	365,280	1,652	0	365,280	365,092	365,092	-
Percent change	-	-	-	-	-	-	87.5
Area							
Number of farms	9,263	-	530	8,733	2,376	2,906	-6,357
Cropland	2,288,678	-	494,142	1,794,532	1,794,325	2,288,465	-
Percent change	-	-	-	-	-	-	68.6

If the cropland acreage presently in farms below the minimum requirements to return the desired income were adjusted 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 decrease farm numbers from 9,263 to 2,906. This would be a decrease of 6,357 farms or 68.6 percent.

The largest percentage decrease would occur in farms on rolling loam soils. This decrease would be 87.5 percent, or from 1,771 farms presently to 221 farms. Sandy soils would have the largest decrease in farm numbers, 1,810 farms. This would be a 67.4 percent decrease. The smallest decrease would occur on level loam soils, where farm numbers would be decreased by 1,414 farms, or by 59.9 percent.

Adjustment For $7,000 Return

If all the cropland in the area were adjusted into farming units of the minimum size to obtain a $7,000 return to operator labor and management, a maximum of 2,224 farms would be possible in the area (Table XII). This would be a decrease of 7,039 farms from the present 9,263 farms in the area, for a decrease of 76.0 percent.

The largest percentage decrease would occur in farms on the rolling loam soils, where a 92.4 percent decrease would be required. The largest decrease in farm numbers would occur in farms on sandy soils, where the decrease would be 2,031 farms, or 75.7 percent. The smallest change would be in farms on level loam soils, where the number of farms would have to decrease by 1,572 farms. This would be a decrease of 66.6 percent in farm numbers on level loam soils.

TABLE XII

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	-	653	-2,031
Cropland	537,548	823	537,419	-
Percent change	-	-	-	75.7
Clay				
Number of farms	2,447	-	647	-1,800
Cropland	780,850	1,206	780,282	-
Percent change	-	-	-	73.6
Level Loam				
Number of farms	2,361	-	789	-1,572
Cropland	605,000	767	605,163	-
Percent change	-	-	-	66.6
Rolling Loam				
Number of farms	1,771	-	135	-1,636
Cropland	365,280	2,696	363,960	-
Percent change	-	-	-	92.4
Area				
Number of farms	9,263	-	2,224	-7,039
Cropland	2,288,678	-	2,286,824	-
Percent change	-	-	-	76.0

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 XIII). These farms control only 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 farms above the minimum cropland requirement to obtain the desired income.

When the cropland acreage presently in farms below the minimum acreage requirement is adjusted into farms of the minimum size, a maximum of 1,929 farms are possible. Adding these farms to the 199 farms presently above the minimum size would give a maximum of 2,128 farms for the area with the present farm size distribution. This would be a decrease of 7,135 farms, or 77.0 percent.

Farms on rolling loam soils would be decreased by 1,636 farms, or by 92.4 percent. Farms on sandy soils would decrease by 2,046 farms, or 76.2 percent. Farms on level loam soils would be decreased by 1,641 farms, or by 69.5 percent. This was the smallest percentage decrease of any soil type.

Implications For Labor Adjustment

These estimates imply that there are a substantial number of farm operators who are now operating farms with cropland average 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 would be in nonfarm employment.

TABLE XIII

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	602	638	-2,046
Cropland	537,548	823	41,692	495,856	495,446	537,138	-
Percent change	-	-	-	-	-	-	76.2
Clay							
Number of farms	2,447	-	42	2,405	593	635	-1,812
Cropland	780,850	1,206	65,748	715,102	715,158	780,906	-
Percent change	-	-	-	-	-	-	74.0
Level Loam							
Number of farms	2,361	-	121	2,240	599	720	-1,641
Cropland	605,000	767	145,200	459,800	459,433	604,633	-
Percent change	-	-	-	-	-	-	69.5
Rolling Loam							
Number of farms	1,771	-	0	1,771	135	135	-1,636
Cropland	365,280	2,696	0	365,280	363,960	363,960	-
Percent change	-	-	-	-	-	-	92.4
Area							
Number of farms	9,263	-	199	9,064	1,929	2,128	-7,135
Cropland	2,288,678	-	252,640	2,036,038	2,033,997	2,286,637	-
Percent change	-	-	-	-	-	-	77.0

Consider, for example, the possible implications of the indicated adjustments for a $3,000 farm operator labor and management return. The indicated needed adjustment is to decrease farm numbers by 4,759 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 9,518,000 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 removing 6,357 operators. This could add 12,714,000 hours of labor to the nonfarm work force. For a $7,000 return to operator labor and management, 7,135 operators would be removed from the farms. This could add 14,270,000 hours to the nonfarm labor force.

It is probable that all of this labor would not go into nonfarm employment. Some of the labor, especially at the higher income levels, would be needed to meet the hired labor requirements of the farms remaining. However, it is quite evident that there is a need for some adjustment in labor from farm to nonfarm employment. To implement this adjustment, policies could be formulated which will train this farm labor for nonfarm employment and help the farm labor in moving to and obtaining nonfarm employment. Also, policies could give consideration to helping farmers remaining in agriculture to obtain the necessary capital to increase farm size to the indicated minimum size.

Aggregate Area Output And Requirements

In determining the maximum number of farms possible in the area for operators to obtain the specified incomes, it was assumed that all farms would be organized to include the optimum combination of enterprises as programmed for these incomes. Therefore, with these assumptions, the reorganization of farms in the area would change the composition of the output of the area. This change in output must be considered in evaluating the implications of the needed adjustment.

The program results for the different specified returns indicate that as the size of farm increases for each soil type, the combination of enterprises on the farms maintains a fairly constant ratio. A minor exception is the larger-sized clay farms. At the $7,000 income level, the acreage in sudan grazing is decreased, with blue panic-sudan grazing added as an enterprise.

In estimating the aggregate acreages of the various crops, the assumption is made that even though the farms which are presently above the required size for adjustment will not decrease in size, these farms will utilize the same enterprises in the same ratio as the farms which adjust farm size. The linearity of the enterprise uses is more clearly shown when aggregates are made for the three specified income levels. The aggregate acreage of all crops and the aggregate number of cows and feeders is virtually the same for each aggregation. The minor differences could be due to rounding the individual farm enterprise levels to the nearest whole number. Some differences are shown in the requirement for operator labor, hired labor, machinery investment and operating capital for the three aggregates. Therefore, Table XIV shows the

TABLE XIV

AREA AGGREGATE ACREAGE OF CROPS, NUMBERS OF LIVESTOCK AND RESOURCE REQUIREMENTS, AFTER INDICATED ADJUSTMENTS IN FARM SIZE AND ENTERPRISE COMBINATIONS, FOR SPECIFIED SOILS OF LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA, CURRENT LAND AND LABOR PRICES

Item	Unit	Soil Types				Area Total
		Sandy	Clay	Level Loam	Rolling Loam	
Aggregates consistent with $3,000, $5,000 and $7,000 return						
Crops						
Cotton	Acres	165,572	95,775	121,739	69,299	449,385
Wheat	Acres	70,290	375,301	176,240	124,315	746,155
Alfalfa	Acres	95,282	-	138,092	34,914	268,288
Grain sorghum	Acres	49,984	-	127,190	64,538	241,712
Oats	Acres	-	32,821	-	-	32,821
Small grain hay	Acres	26,554	107,025	16,353	14,812	164,744
Small grain grazing	Acres	34,364	42,810	27,255	13,754	118,183
Sudan grazing	Acres	-	107,025	-	-	107,025
Reseeded cropland	Acres	95,282	-	-	43,907	139,189
Fallow	Acres	-	22,832	-	-	22,832
Cows	Number	14,058	-	7,268	8,464	29,790
Feeders	Number	71,852	216,904	65,412	34,914	389,082
Investment in Land and Buildings	Dollars	109,964,800	104,974,401	185,984,486	79,588,050	480,511,737

TABLE XIV (continued)

Item	Unit	Soil Types				Area Total
		Sandy	Clay	Level Loam	Rolling Loam	
$3,000 Return Requirement						
Operator Labor	Hours	2,105,598	1,732,757	2,190,996	865,062	6,894,413
Hired Labor	Hours	341,494	581,837	810,688	283,933	2,017,952
Machinery Investment	Dollars	13,253,570	17,466,480	16,661,890	7,907,492	55,289,432
Operating Capital	Dollars	22,188,210	35,707,821	18,048,261	10,828,101	86,772,393
$5,000 Return Requirement						
Operator Labor	Hours	1,498,030	1,316,408	1,517,224	378,794	4,712,456
Hired Labor	Hours	562,611	792,091	859,269	595,595	2,809,566
Machinery Investment	Dollars	12,194,028	14,195,160	11,785,020	6,307,119	44,481,327
Operating Capital	Dollars	22,541,970	36,044,148	18,343,689	11,102,819	88,032,636
$7,000 Return Requirement						
Operator Labor	Hours	1,093,532	1,017,823	1,227,491	231,390	3,570,236
Hired Labor	Hours	821,717	1,067,458	1,012,480	739,260	3,640,915
Machinery Investment	Dollars	9,638,933	12,276,825	11,294,535	6,287,625	39,497,918
Operating Capital	Dollars	24,512,314	36,298,641	18,598,308	11,200,815	90,610,078

aggregate acreage of crops, number of cows and feeders, and investment in land and buildings which would be applicable to the three income levels. The operator labor, hired labor, machinery investment and operating capital for each of the income levels are also shown.

As the farm-size requirement becomes larger, fewer farms are possible in the area, so that fewer hours of operator labor are required for the higher income level aggregates. The aggregate requirement of hired labor increases for the higher income level aggregates. However, the total labor requirement would be smaller for the higher income aggregates, because as operator labor became more of a limiting factor, the program optimum shifted from cotton enterprises which are hand harvested to cotton enterprises which are machine harvested.

The machinery investment does not increase proportionately with the increase in acreage requirements. Therefore, the machinery investment is proportionately smaller for the higher income aggregates. The larger size farms require more expenditures on hired labor. Therefore the aggregate operating capital requirement increases as the requirements for higher income levels are aggregated.

The cotton and wheat acreage would be approximately the present acreage allotments since the present allotments were used as restrictions in the program (Table XV). The expected acreage after adjustment for alfalfa hay, grain sorghum and small grain hay would be a substantial increase over the present acreage of these crops. Present acreage in grazing crops is not available. However, it is expected that the estimates of acreage of these crops after adjustment is also a substantial increase over the present acreage level.

TABLE XV

ESTIMATED PRESENT ACREAGE OF CROPS AND NUMBER OF LIVESTOCK, ESTIMATED ACREAGE OF CROPS AND NUMBER OF LIVESTOCK AFTER ADJUSTMENT AND EXPECTED CHANGE IN ACREAGE AND NUMBERS FOR THE INCLUDED RESOURCES OF THE LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Crops or Animals	Unit	Present Level[1]	Estimated Level After Adjustment	Estimated Change
Cotton	Acres	461,161	449,385	- 11,776
Wheat	Acres	744,334	746,155	1,821
Alfalfa	Acres	71,670	268,288	196,618
Grain sorghum	Acres	175,139	241,712	66,573
Oats	Acres	43,633	32,821	- 10,812
Small grain hay	Acres	13,911	164,744	150,933
Small grain grazing	Acres	[2]	118,183	NA
Sudan grazing	Acres	[2]	107,025	NA
Reseeded cropland	Acres	[2]	139,189	NA
Cows	Numbers	[3]	29,790	NA
Feeders	Numbers	72,434[3]	389,082	NA

[1]Preliminary estimates - 1959 Census of Agriculture, Department of Commerce, Bureau of Census.

[2]No estimates of grazing acreage was obtainable from preliminary 1959 census data.

[3]Estimate of cows and calves sold off included farms.

The present estimate is for cows and calves sold on included farms, so that no comparison of cows and feeders can be drawn. However, from comparing the number of cows and feeders on the farms in the sample survey of the area with the programmed number of cows and feeders per farm, a substantial increase in livestock numbers, especially feeders, is indicated. There may be some doubt whether the present market can adjust enough to supply this number of feeders to farmers at the time desired so that the number can be increased to this level immediately.

The conclusion drawn from these results is that with farms reorganized for the programmed optimum combination of enterprises, the aggregate output of the area will not be affected by the size of the farms. However, the size of the farms will affect the quantity of resources, especially labor and capital, used in producing the output.

Capital Requirements

The results presented indicate that a substantial quantity of capital is required to operate a farm of the size necessary to obtain the income levels programmed. 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 capital requirements would be of considerable interest and a definite 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

$116,696 (Table XVI). This total includes $90,094 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 requirement.

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 $5,000 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 $216,057 in land investment, 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 to the average investment per worker in industry. Estimated investment per worker for selected corporations are shown in Table XVII. 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 of the study.

The lack of adequate financing may be a serious obstacle to the adjustment of all farms to a size necessary to obtain a return to operator labor and management comparable to that which could be earned

TABLE XVI

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	12,240	9,170	14,948	10,364
Operating capital	14,205	25,023	9,933	20,469	16,265
Total capital	93,090	110,826	121,461	185,867	116,696
Percent labor & mgmt. return per dollar investment	3.22	2.71	2.47	1.67	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	14,041
Operating capital	24,694	39,916	16,219	50,239	27,788
Total capital	158,526	161,962	190,833	438,158	193,506
Percent labor & mgmt. return per dollar investment	3.15	3.07	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 XVII

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 etroleum 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 Gypsom	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.

in industry. The majority of farmers in the area do not own enough land to meet the equity requirements for financing such expansion under present policies of lending agencies. Either new lending policies must be formulated or farmers must depend on methods other than land purchase to increase the size of the operation.

It is possible that new lending policies might be achieved either by the private lending agencies changing their present equity requirements or by governmental action to supplement the credit sources now available to farmers.

Presently in the area many owner operators are renting additional land. If rental land is available, this provides a means for immediate adjustment to the necessary size of farm. Money to make smaller land purchases could be borrowed with the farmers' present equity, and as the equity position improves, all the necessary additional land could be purchased.

Further study and consideration should be given to the problem of financing agricultural operations. Consideration could be given to the types of changes and methods of changing the policies and practices of lending agencies, both private and governmental, in making farm loans. Such changes could expediate the adjustments in farm size and numbers.

CHAPTER VI

RETURNS TO OWNED RESOURCES

In making decisions, farm operators may be willing to accept returns to owned resources other than operator labor as part of the desired income goal. The operator return in these instances would be a return to operator-owned resources rather than returns to operator labor and management. The minimum resource requirement and adjustment pattern to obtain this type of return might be quite different from the requirements to obtain the same level of return to operator labor and management.

Within the area of the study, most farmers own some land, machinery and other resources. Most of these operators would probably consider the return to this land and machinery as part of the desired income. The important question would be: How much more land will they need to obtain an equitable income? On all four soil situations, the model size of farm owned by the operator was 160 acres of land. Program solutions were obtained to determine the quantity of land which would have to be purchased in addition to the land already owned for the operator to obtain each of the income levels.

In constructing the model for the analysis, the same land composition and labor restrictions as in the previous model were used. The operator was assumed to own 160 acres of land with no specified return required for this land. The operator was also assumed to own the

machinery required to operate the farm. No interest was charged on the machinery investment, but since a long-term planning period is assumed, machinery depreciation was charged so that the worn out could be replaced. Any additional land required could be purchased at an interest of 5 percent. However, the interest and principal on any purchased land is to be ammortized in 33 equal annual payments. Programs were computed on each of the four soil situations, but only at current land and hired labor prices.

The Results

All of the results and requirements for this analysis are shown in Appendix E. The primary interest is the difference in the requirements for the return to operator-owned resources and returns to operator labor and management. Only the cropland requirement and the requirement for purchasing cropland are shown in this chapter.

On clay soils, a $3,000 return to operator-owned resources can be obtained on a minimum of 450 acres of cropland (Table XVIII). This requires the purchase of 325 acres in addition to the 125 acres already owned. A $5,000 return to operator-owned resources can be obtained on a minimum of 815 acres of cropland. This requires the purchase of 690 additional acres of cropland. A minimum of 1,211 acres of cropland is required to obtain a $7,000 return to operator-owned resources. This requires the purchase of 1,085 additional acres.

On level loam soils, a minimum of 185 acres of cropland is required to obtain a $3,000 return to operator-owned resources. This requires

TABLE XVIII

ESTIMATED MINIMUM CROPLAND[a] REQUIREMENT TO OBTAIN SPECIFIED RETURNS TO OPERATOR-OWNED RESOURCES,[b] 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	450	815	1,211
	Purchased Cropland	acres	325	690	1,085
Level Loam					
	Total Cropland	acres	185	443	768
	Purchased Cropland	acres	60	319	644
Rolling Loam					
	Total Cropland	acres	593	1,341	2,216
	Purchased Cropland	acres	469	1,216	2,091
Sandy					
	Total Cropland	acres	236	525	829
	Purchased Cropland	acres	111	400	705

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

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

the purchase of 60 additional acres. A $5,000 return to operator-owned resources can be obtained on a minimum of 443 acres of cropland. The purchase of 319 additional acres of cropland is required. A minimum of 768 acres of cropland is required to obtain a $7,000 return to operator-owned resources. This requires 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 1,344 acres of cropland is required to obtain a $5,000 return to operator owned resources. This would require the purchase of 1,216 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 236 acres, with the purchase of 111 acres required. A $5,000 return to operator-owned resources can be obtained with a minimum of 525 acres of cropland, of which 400 acres would be purchased. The minimum cropland requirement to obtain a $7,000 return to operator-owned resources is 829 acres. The purchase of 705 additional acres is required.

Comparison of Results

The analysis of this chapter has been made to determine the specified income levels as a return to operator-owned resources. In Chapter IV, analyses were made to determine the same income levels as a return to operator labor and management. It would be expected that the minimum

resource requirements to obtain the income level as returns to operator-owned resources are less than the minimum requirements to obtain the same incomes as 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 types than can a $3,000 return to operator labor and management (Table XIX). The difference ranges from 98 acres for clay and rolling loam soils 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.

A $5,000 return to operator-owned resources can also be made on fewer cropland acres than a $5,000 return to operator labor and management. The difference at this level of return ranges from 50 fewer acres on clay farms to 311 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. On Rolling Loam soils, a $7,000 return to operator-owned resources can be obtained on 480 fewer acres of cropland than a $7,000 return to operator labor and management. The return to operator labor and management assumes a return of 5 percent on all land and 6 percent on machinery investment. The return assumes no return to the first 160 acres of land and the machinery. However, the remainder of the required land investment is charged at a rate of 5 percent and ammortized for 33 years. At the $7,000 return level, the payment on the investment in additional land is nearing or equals the 5 percent

TABLE XIX

COMPARISON OF THE MINIMUM LAND AND OPERATING CAPITAL REQUIREMENT TO OBTAIN THE SPECIFIED INCOMES AS RETURNS TO OWNED RESOURCES (CHAPTER VI) AND RETURNS TO OPERATOR LABOR AND MANAGEMENT (CHAPTER IV) CURRENT LAND AND LABOR PRICES

		- Income Levels -					
		$3,000		$5,000		$7,000	
Type of Soil	Unit	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	Requirement for Return to Owned Resources	Requirement for Return to Operator Labor and Management
Clay							
Cropland	acres	450	547	815	865	1,211	1,206
Operating capital	dollars	20,428	25,023	37,496	39,916	56,255	56,103
Level Loam							
Cropland	acres	185	333	443	535	168	767
Operating capital	dollars	5,412	9,933	13,397	16,219	23,621	23,572
Rolling Loam							
Cropland	acres	593	691	1,341	1,652	2,216	2,696
Operating capital	dollars	17,438	20,469	40,541	50,239	67,896	82,969
Sandy							
Cropland	acres	236	344	525	589	829	823
Operating capital	dollars	11,541	14,205	21,572	24,690	35,326	37,538

return on the 160 acres. Therefore, the requirement for the two analyses are approximately equal.

The analysis to determine the requirements to obtain a specified return to operator-owned resources does not provide a specified return to the investment in the originally-owned acreage of land. However, this acreage of land does provide a basis for staying in farming and may have a speculative value to the farmer. Land value has tended to increase over time in this country. Therefore, by owning this land, the value of the operators equity may increase. Since the analyses require the owner-operator to purchase the additional acreage needed, his equity also increases as he pays off the indebtedness. At the end of the 33 year period, he will have gained full ownership of the total land investment of the farm.

The analysis to obtain the minimum requirement to obtain the specified income as return to operator labor and management, assumes the farmer views land strictly as an investment. The investment must yield a specified return each year. Any speculative value in having investment in land is pure gain or profit above the farm operation. However, the model does assume the operator already owns the required land. If this land must be purchased, then the payment on the principal must come from the specified return to land and operator labor and management. After the indebtedness is paid off, the farm operator actually receives all the specified returns to land and operator labor and management. Only in the instances where the farmer already owns the land, or rents land for a cost equal to the specified return to land, would the operator immediately receive the specified return to operator labor and management when operating this size farm.

CHAPTER VII

SUMMARY AND IMPLICATIONS

This study had two over-all objectives. One was to determine the minimum resource requirements to obtain specified levels of return to operator labor and management on farms in the eleven-county area of the Low Rolling Plains of Southwestern Oklahoma. The second was to determine the required adjustments in farm numbers and resource use if all farmers remaining in agriculture obtain these levels of income. The specified incomes were determined to represent approximately the returns to similar quality labor in nonfarm employment.

Within the area, the soil was classified into four soil resource situations based on soil texture and productivity, climate, moisture, and land capability classes. A typical acre of land for each soil situation was defined so that each acre of land (and hence each optimum farm from the program solutions) had the same distribution of soil productivity classes as these classes were distributed for the total land area included in each situation.

Land currently used in farming enterprises which were not considered general adjustment opportunities, such as dairy, beef cattle ranches, etc., was excluded from the soil resource base. The productive alternatives which were considered in determining the optimum farm plans were limited to cotton, wheat, other feed grains, alfalfa and land-based livestock enterprises.

Estimated 1961 prices were used for all products and resources sold or used by farmers. The current price for land transactions was estimated. Also three variations from this current price, 25 percent below, 25 percent above and 50 percent above, were used for different computations. Three variations in hired labor price, current, 50 percent above and 100 percent above current price, were also used for different computations. Current allotment restrictions on cotton and wheat production were assumed.

Linear programming techniques were used to determine the minimum land requirement and the optimum combination of enterprises to obtain three levels of operator labor and management return for each of twelve different combinations of land and hired labor prices on each of the four soil situations. Within the framework of the model, a return of 5 percent was required on the total land investment and a return of 6 percent was required on machinery and operating capital (above the returns to operator labor and management).

Results

The minimum resource requirements which will yield a farm-operator labor and management return equal to the return to labor in nonfarm employment are considerably higher than the present average resource use. At current price levels, the minimum resource required to obtain a $3,000 return to operator labor and management ranged from 426 acres of land and $121,461 of total capital on level loam soils to 885 acres of land and $185,867 total capital on Rolling Loam soils. Within the included land area, only 1,613 farms, or 17.4 percent, are

currently at or above the minimum farm size to obtain this level of return. If all the included land area were adjusted into farms of the minimum size to obtain this return, farm numbers would be decreased by 3,928 farms (42.4 percent). Assuming that the farms currently above the minimum size would not be adjusted, the number of farms would have to be reduced by 4,759 farms (51.4 percent), for all farmers to obtain, at a minimum, a $3,000 return to operator labor and management.

The minimum resource requirements to obtain a $5,000 return to operator labor and management (which is approximately the average return to nonfarm labor) ranged from 684 acres of land and $190,885 total capital on Level Loam soils, to 2,114 acres of land and $438,156 total capital on Rolling Loam soils. Currently only 530 farms (5.7 percent) in the land area included in the study are at or above the minimum size to obtain this level of return. If all of the included soils were adjusted into farms of the minimum size to obtain a $5,000 return, farm numbers would be reduced by 6,095 farms (65.8 percent). Assuming the farms currently above the minimum required size would not adjust, the number of farms would be reduced by 6,357 farms (68.6 percent) if all farmers are to receive, at a minimum, a $5,000 return to operator labor and management.

The minimum resource requirements for a $7,000 return to operator labor and management ranged from 982 acres of land and $273,481 total capital on Level Loam soils to 3,450 acres of land and $716,044 total capital on Rolling Loam soils. Currently, only 199 farms (2.1 percent) are at or above the minimum size to obtain this return. If all the included soil resources were adjusted into farms of the minimum size to

obtain a $7,000 return, farm numbers would be decreased by 7,039 farms (76.0 percent). Assuming the farms currently above the required minimum acreage remain at their present size, the number of farms would be reduced by 7,135 farms (77.0 percent) for all farmers to receive, at a minimum, this return to operator labor and management.

Since a return of 5 percent of the total investment in land was required for all solutions, any change in land price significantly affected the minimum land requirement. On the other hand, changes in the hired labor price affected the minimum solution only when the basic solution required a substantial amount of hired labor in the operation. On all soil situations, except Rolling Loam, the minimum farm size to obtain these income levels with land priced at the current level or below was small enough so that only a small quantity of hired labor was required. Therefore, increases in the hired labor price with land priced at these levels did not significantly change the solutions. With land prices above the current level, hired labor price increases did make a significant difference in the solutions.

On Rolling Loam soils, the desired income could not be obtained with land priced at the current level and hired labor priced at $2.00 per hour, or with land priced at any level above the current price. On Level Loam soils, the income could not be obtained when land price was increased to 50 percent above the current price. On Sandy and Clay soils, the income could not be obtained (with land price at 50 percent above the current level) when labor price was increased above the current level.

The aggregate acreage of cotton and wheat for the reorganized farms would be (because of the allotment restriction) approximately the same

as the current acreage of these crops on the soil resources. The acreage of feed grains and alfalfa hay would be a substantial increase above the 1959 acreage as reported in the Census of Agriculture. Although the number of feeders and cattle on the included farms in 1959 could not be accurately determined from the limited preliminary census, the aggregate number of cattle on the reorganized farms is suspected to be substantially above the number of cattle presently on these farms. Also a considerable acreage of the lower productivity classes of cropland would be reseeded to pasture.

It is probable that most farmers own some resources for farm operations. If the farmer is willing to accept a return to these owned resources as part of the farm operator return, the specified return can possibly be made with fewer required resources than if the return is only to farm-operator labor and management. Programs were computed in which the operator was assumed to own a quarter section of land and the machinery to operate the farm, but was required to buy (with a 33-year payment period) any additional land required to obtain the specified income. The $3,000 and $5,000 return could be obtained on fewer acres than in the analysis in which the returns were only to operator labor and management. However, the land requirement for a $7,000 return was approximately the same for both analyses except on Rolling Loam soil. On this soil situation, the farmer owning a quarter section of land could also obtain a $7,000 return on fewer acres than was required if the return were only to operator labor and management.

Implications

In the past, farm programs have been designed to increase farm income by supporting the prices of agricultural commodities and restricting production by allotment controls. However, many feel that these programs have kept many small and inefficient operators in agriculture. Also, the average farm income continues to be much lower than the average income in nonfarm employment. It seems that these programs alone are not the solution to the farm problem.

Programs which support farm prices, but which also tend to keep excess labor in agriculture, do not provide for the maximum efficiency of the agriculture sector of the economy or for the entire economy. Economic growth may be retarded because of the inefficient use of labor in agriculture.

Farm policies to increase net farm income could be oriented toward adjustments which move labor from agriculture into other employment. Farmers remaining in agriculture could then adjust into larger farm operations and increase their income.

The results of this study indicate that over 80 percent of the farmers within the area of the study are too small, even with the most efficient operation, to obtain 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 these displaced farm operators could be used as hired labor on the reorganized farms, most of them will require employment in nonfarm work. In most instances, they will require training in nonfarm skills. Also, obtaining nonfarm employment probably will require moving to another area to perform the work.

The study indicates that farm output will not decrease with a substantial outward adjustment of farm labor if the remaining farms reorganize into larger units. Possibilities are that farm output will continue to increase even with less labor in agriculture. The surplus problem could continue to plague agriculture. Therefore, probably some restrictions on land use will also be required.

The study also indicates that present land prices are probably higher than present farm income justifies, based on the interest rates assumed in the study. The estimated increase in average farm income obtainable from the labor adjustments could not justify further increases in land prices. If these increases do occur, the income to operator labor and management of the farmers remaining in agriculture will be much lower than estimated.

Need for Further Research

The analyses for this study were made only at the current level of prices for farm commodities and resources except for land and hired labor. Agricultural prices have shown considerable fluctuations in the past and probably will do so in the future. Therefore, further research postulating these expected changes, or using variations in product and resource prices, will be very helpful in further analyzing the problem.

The capital market will be very instrumental in reorganizing the farms in agriculture. Research is needed to determine ways and means for farmers to obtain credit or the desired capital to increase the farm size to the level necessary to obtain the equitable income. Moving farmers out of agriculture will not be enough. The remaining farmers must be able to utilize the resources and adjust the farm operation into larger units.

The analysis of Chapter VI utilized only one size of farm ownership on each of the soil situations. Since all the situations react in approximately the same way, much more useful analysis could be made by varying the size of the owned operation on any soil situation and making an analysis for these various sizes.

Limitations of the Study

Although the study did vary the price of land and hired labor, no attempt was made to evaluate the reaction of the prices to the adjustment. As more labor leaves agriculture, the competitive bidding for farm labor will become greater. Therefore, farm wage rates will probably increase. Also, the adjustments could affect land prices. Farmers wishing to leave agriculture will place more land on the market. However, with the remaining farmers desiring to increase farm size, there will be a larger demand for farm land. Which of these interactions will be stronger, and which direction land price will go, would be difficult to postulate. However, it is conceivable that land values would change as the adjustments take place.

The study has ignored the possibility of off-farm work or part-time farming. Widespread opportunities for some off-farm work to meet part of the income goal would greatly reduce the requirement for farm income. Therefore, many more farmers could be supported by agriculture with their dual-role farming situation.

It must be emphasized that the results presented herein 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 had perfect knowledge. The study is not intended to predict the actual reaction of farmers, nor the actual adjustment pattern farmers will take.

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A P P E N D I C E S

APPENDIX A, TABLE I

DEFINITIONS OF LAND RESOURCE SITUATIONS AND YIELD LEVELS BY LAND CLASSES, CLAY SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Dry Land

C_b - Land Capability Class IIs. Deep, level (0 to 1 percent slope) with negligible to moderate erosion. Soil Units 1 and 5, Foard-Tillman equivalents.

C_c - Land Capability Class IIIe. Deep, moderately sloping (1 to 3 percent slopes) with negligible to moderate erosion. Soil Units 1 and 5, Foard-Tillman equivalents.

C_d - Land Capability Class IVe. Sloping (3 to 5 percent slopes) with negligible to moderately severe erosion, or moderately sloping (B slopes) with moderately severe erosion. Soil Units 1 and 5, Foard-Tillman equivalents.

C_e - All other cropland classes. Rolling (5 to 8 percent slopes) or lesser slopes with severe erosion. Not adapted to harvested crops.

Crop	Unit	C_b	C_c	C_d	C_e
Wheat (continuous)					
after row crop	bu.	14	12	10	--
(6 mo. fallow)	bu.	17	14	11	--
after 12 mo. fallow	bu.	19	16	12	--
Cotton	lb. lint	175	125	--	--
Oats (continuous)	bu.	28	20	15	--
Small grain hay	ton	1.6	1.5	1.4	--
Grazing[1]					
Sudan	AUM	3.0	2.8	2.6	1.9
Grazed out small grain	AUM	3.1	2.9	2.8	1.9
Harvested small grain	AUM	.4	.35	.3	.2
Blue panic grass	AUM	3.4	3.2	3.0	2.1

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

Source: John W. Goodwin, et al., Resource Requirements, Costs and Expected Returns; Alternative Crop and Livestock Enterprises; Clay Soils of the Rolling Plains of Southwestern Oklahoma, Processed Series P-357, Oklahoma Agricultural Experiment Station, in cooperation with Farm Economics Research Division, Agricultural Research Service, U. S. Department of Agriculture, Stillwater, Oklahoma, September, 1960.

APPENDIX A, TABLE II

DEFINITIONS OF LAND RESOURCE SITUATIONS AND YIELD LEVELS BY LAND CLASSES, LOAM SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Dry Land

L_a - Land Capability Class I. Deep, level (0 to 1 percent slope) with negligible to moderate erosion. Soil Units 2, 4, 7, and 9. Upland-Tipton, St. Paul, and Carey Soils; Bottomland-Spur and Canadian Soils (or their equivalents).

L_b - Land Capability Class II. Deep, moderately sloping (1 to 3 percent slopes) with negligible to moderate erosion. Same soils as above.

L_c - Land Capability Class III. Sloping (3 to 5 percent slopes) with negligible to moderately severe erosion, or moderately sloping (B slopes) with moderately severe erosion. Same soils as above plus Quinlan and Vernon soils (or their equivalents).

L_d - Land Capability Class IV. Rolling (5 to 8 percent slopes) or lesser slopes with severe erosion. Same soils as L_c.

L_e - All other cropland classes. Shallow or severely eroded on variable slopes. Not adapted to row crops.

Crop	Unit	L_a	L_b	L_c	L_d	L_e
Cotton	lb. lint	275	225	185	100	--
Wheat	bu.	23	18	14	11	--
Alfalfa						
hay basis	ton	3.0	2.25	--	--	--
hay and seed basis	ton	2.5	1.75	--	--	--
(seed)	lb.	100	75	--	--	--
Grain sorghum	lb.	1,600	1,450	1,200	900	--
Forage sorghum	ton	2.2	2.0	1.7	1.2	--
Small grain hay	ton	2.0	1.8	1.5	1.0	--
Grazing[1]						
Sudan	AUM	3.0	2.4	1.7	1.3	1.0
Grazed out small grain	AUM	4.0	3.5	3.0	2.8	2.0
Harvested small grain	AUM	.6	.5	.4	.3	--

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

Source: Larry J. Connor, et al., Resource Requirements, Costs and Expected Returns; Alternative Crop and Livestock Enterprises; Loam Soils of the Rolling Plains of Southwestern Oklahoma, Processed Series P-368, Oklahoma Agricultural Experiment Station, in cooperation with the Farm Economics Research Division, Agricultural Research Service, U. S. Department of Agriculture, Stillwater, Oklahoma, February, 1961.

APPENDIX A, TABLE III

DEFINITIONS OF LAND RESOURCE SITUATIONS AND YIELD LEVELS BY LAND CLASSES, SANDY SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Dry Land

S_b - Land Capability Class II. Deep, level to moderate slope (0 to 3 percent). Soil Units 70, 7X, 12, 12X. Miles, Dill, Pratt, and Enterprise soils (or their equivalents).

S_c - Land Capability Class III. Deep, moderately sloping (3 to 5 percent). Same soils as above.

S_d - Land Capability Class IV. Sloping (5 to 8 percent). Same soils as above plus some Brownfield and Nobscott soils (deep-plowed Brownfield soils would be included in the S_b group).

S_e - All other cropland classes. Rolling over 8 percent slope or lesser slope with severe erosion or shallow soil. (Not adapted to row crops.)

Crop	Unit	S_b	S_c	S_d	S_e
Cotton[1]	lb. lint	325	275	150	--
Wheat[2]	bu.	18	14	8	--
Grain sorghum[3]	lb.	1,750	1,300	1,000	--
Alfalfa[4]					
hay basis	ton	2.5	2.0	--	--
hay and seed basis	ton hay	2.0	1.5	--	--
	lb. seed	75	50	--	--
Small grain hay[2]	ton	1.7	1.5	1.2	--
Forage sorghum[3]	ton	2.0	1.7	1.0	--
Grazing[5]					
Sudan[6]	AUM	2.7	1.9	1.3	.9
Grazed out small grain	AUM	3.3	2.8	2.3	1.5
Harvested small grain	AUM	.4	.3	.2	--
Rye cover crop	AUM	.5	.4	.3	--

[1]100 lbs. 10-20-10 and rye cover crop.

[2]100 lbs. 13-39-0.

[3]100 lbs. 16-20-0.

[4]100 lbs. 8-32-16 for establishment and 100 lbs. of 0-46-0 during life of stand (4 years). Not more than 25 percent of cropland in each adapted class may be in alfalfa.

[5]Permanent pasture grazing yield is 1 AUM per acre of range.

[6]150 lbs. 16-20-0.

Source: Percy L. Strickland, Jr., et al., Resource Requirements, Costs and Expected Returns; Alternative Crop and Livestock Enterprises; Sandy Soils of the Rolling Plains of Southwestern Oklahoma, Oklahoma Agricultural Experiment Station Processed Series P-369, February, 1961.

APPENDIX B, TABLE I

ASSUMED CURRENT (1961) PRICES RECEIVED BY FARMERS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Item	Unit	Price (dollars)
Cotton, lint (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 B, Table II.

APPENDIX B, TABLE II

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 Average
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
	- 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 Jackson L. James and James S. Plaxico, Beef Cattle Prices; Seasonal Movements and Price Differentials on the Oklahoma City Market, Oklahoma Agricultural Experiment Station Bulletin B-486, February, 1957.

APPENDIX B, TABLE III

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

APPENDIX B, TABLE III (Continued)

Item	Unit	Price (dollars)
Hauling		
Cotton	cwt. seed cotton	$ .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
Fuel and Lubricant		
Gasoline	gal.	.20
L. P. 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 IV

ASSUMED COMPLEMENT OF 4-ROW MACHINERY,[a] CLAY SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Item	Quantity	Specification	Acquisition Price[b]
			(dollars)
Tractor	1	4 or 3-16 tricycle, L.P., P.S. hydraulic system, PTO, 3 point hitch, 51 h.p.	$8400.00
Moldboard	1	3-16" interval	415.00
Oneway	1	12 ft.	900.00
Spike-tooth Harrow	1	3-section (24 ft.)	135.00
Planter	1	4-row wheel plain for corn or cotton	630.00
Cultivator	1	4-row	610.00
Grain drill	1	16-8" plain drag chain	550.00
Tool Bar	1	12 ft. with plows and interval	495.00
		Total Investment	8135.00
		Average Investment	4067.50
		Annual Interest Charge[c]	244.05
		Annual Depreciation Charge[d]	715.88

[a]Cotton, wheat, and hay crops are assumed to be custom harvested.

[b]Acquisition price is the average price obtained in a survey of machinery dealers in Southwestern Oklahoma.

[c]Annual interest is 6 percent of average investment.

[d]Annual depreciation is calculated by subtracting salvage value (12 percent of new value) from the new value and depreciating the remainder on a straight line basis for a ten-year period.

APPENDIX B, TABLE V

ASSUMED COMPLEMENT OF 4-ROW MACHINERY,[a] LOAM SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Item	Quantity	Specification	Acquisition Price[b]
			(dollars)
Tractor	1	4 or 3-16 tricycle, L.P., P.S. hydraulic system, PTO, 3 point hitch, 51 h.p.	$4,400.00
Moldboard	1	4-16" interval	520.00
Oneway	1	12 ft.	900.00
Tool Bar	1	12 ft. with plows and interval	495.00
Planter	1	4-row with Pre-emerge equipment	1,020.00
Cultivator	1	4-row	610.00
Gyromor	1	5 ft. lighthousing interval	360.00
Grain drill	1	16-8" press wheel fertilizer	730.00
Spike-tooth Harrow	1	3-section (24 ft.)	135.00
		Total Investment	9,170.00
		Average Investment	4,585.00
		Annual Interest Charge[c]	275.10
		Annual Depreciation Charge[d]	806.90

[a]Cotton, wheat and hay crops are assumed to be custom harvested.

[b]Acquisition price is the average price obtained in a survey of machinery dealers in Southwestern Oklahoma.

[c]Annual interest charge is figured at 6 percent of the average investment.

[d]Annual depreciation was figured by subtracting the salvage value (12 percent of the new value) from the new value and depreciating the remainder on a straight line basis for a ten-year period.

APPENDIX B, TABLE VI

ASSUMED COMPLEMENT OF 4-ROW MACHINERY,[a] SANDY SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Item	Quantity	Specification	Acquisition Price[b]
			(dollars)
Tractor	1	4 or 3-16 tricycle, L.P., P.S. hydraulic system, PTO, 3 point hitch, 51 h.p.	$4,400.00
Moldboard	1	4-16" interval	520.00
Tool Bar	1	12 ft. with plows and interval	415.00
Monitor	1	4-row	495.00
Planter	1	4-row wheel plain for cotton or corn	720.00
Cultivator	1	4-row	610.00
Gyromor	1	5 ft.	360.00
Grain drill	1	16-8" press wheel fertilizer	730.00
Cyclone Rye Seeder	1	6-row	100.00
Spike-tooth Harrow	1	3-section	135.00
		Total Investment	8,485.00
		Average Investment	4,242.50
		Annual Interest Charge[c]	254.55
		Annual Depreciation Charge[d]	746.68

[a]Cotton, wheat and hay crops are assumed to be custom harvested.

[b]Acquisition price is the average price obtained in a survey of machinery dealers in Southwestern Oklahoma.

[c]Annual interest is 6 percent of average investment.

[d]Annual depreciation is calculated by subtracting salvage value (12 percent of new value) from the new value and depreciating the remainder on a straight line basis for a ten-year period.

APPENDIX B, TABLE VII

THREE LEVELS OF ASSUMED ANNUAL OVERHEAD COST FOR FARMS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Item	Size of Operation		
	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

APPENDIX C

PROGRAMMED SOLUTIONS FOR RETURNS TO OPERATOR LABOR AND MANAGEMENT

The program results presented in this section were computed by linear programming techniques[1] on the IBM 650 computer. Separate programs were computed for three specified levels of return on four separate soil situations for each combination of four variations in land price and three variations in hired labor price. The results indicated by "no solution" mean that the solution obtained at this combination of land and labor prices did not provide for the operator labor and management return desired.

The operating capital includes the total capital required to purchase production goods and services including feeder animals. Operating and overhead expense include the actual expense for feed, seed, fertilizer, etc., plus interest on the annual operating capital.[2] The hours of hired labor shown do not include the labor for cotton chopping which is assumed to be contracted at $2.50 per acre.

The actual returns to operator labor and management deviate from the specified income target in some instances. This is because of the error involved in rounding the individual enterprise levels and resource requirements. Also, in some of the programs, interest was computed for

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[1] See footnote 20, page 24.

[2] See page 34 for a definition of annual operating capital.

the total operating capital. This required that the net returns be adjusted for the difference between the interest on total operating capital and interest on annual operating capital.

The model requires a specified return of five percent on land investment and six percent on average machinery investment above the return to operator labor and management. The net return to the farm operation would be the sum of the return to operator labor and management, the return to land investment, six percent times one-half of the machinery investment, and six percent times the amount of operating capital owned by the operator.

APPENDIX C, TABLE I

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[a]	$131.25	$157.50
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	580	701	825	1,896
Cropland	Acres	453	547	644	1,481
Cotton	Acres	54	65	77	178
Wheat	Acres	218	262	309	711
Oats	Acres	19	23	27	65
Small Grain Hay	Acres	62	75	89	203
Sudan Grazing	Acres	62	75	87	166
Small Grain Grazing	Acres	25	30	36	83
Blue Panic-Sudan	Acres	0	0	0	33
Fallow	Acres	13	16	19	42
Feeders	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	Dollars	45,675	73,563	108,281	298,620
Machinery	Dollars	12,240	12,240	12,240	21,804
Operating Capital[b]	Dollars	20,658	25,023	29,510	69,378
Total Capital Requirement	Dollars	78,573	110,826	150,031	389,802
Gross Receipts	Dollars	13,255	15,998	18,794	43,267
Operating and Overhead Expense	Dollars	6,478	7,679	8,916	22,760
Return to Land[c]	Dollars	2,285	3,678	5,412	14,922
Machinery Interest and Depreciation[d]	Dollars	1,465	1,465	1,465	2,579
Return to Operator Labor and Management	Dollars	3,027	3,176	3,001	3,006

APPENDIX C, TABLE I (Continued)

Item	Unit	Land Price Per Acre $78.75	$105.00[a]	$131.25	$157.50
Hired Labor at $1.50 Per Hour					
Total Land	Acres	598	733	942	
Cropland	Acres	467	573	736	
Cotton	Acres	56	69	88	
Wheat	Acres	224	275	353	
Oats	Acres	20	24	31	
Small Grain Hay	Acres	65	79	101	
Sudan Grazing	Acres	63	78	100	
Small Grain Grazing	Acres	26	32	41	
Blue Panic-Sudan	Acres	0	0	0	
Fallow	Acres	13	16	22	
Feeders	Animal	130	158	204	
Operator Labor	Hour	1,210	1,280	1,386	No Solution
Hired Labor	Hour	241	387	613	
Investment					
Land and Buildings	Dollars	47,093	76,965	123,637	
Machinery	Dollars	12,420	12,420	12,420	
Operating Capital[b]	Dollars	21,386	26,393	34,183	
Total Capital Requirement	Dollars	80,899	115,778	170,240	
Gross Receipts	Dollars	13,659	16,692	21,494	
Operating and Overhead Expense	Dollars	6,671	8,217	10,831	
Return to Land[c]	Dollars	2,356	3,848	6,180	
Machinery Interest and Depreciation[d]	Dollars	1,466	1,466	1,466	
Return to Operator Labor and Management	Dollars	3,166	3,161	3,017	

APPENDIX C, TABLE I (Continued)

Item	Unit	Land Price Per Acre $78.75	$105.00[a]	$131.25	$157.50
Hired Labor at $2.00 Per Hour					
Total Land	Acres	617	772	1,264	
Cropland	Acres	482	603	1,264	
Cotton	Acres	58	72	118	
Wheat	Acres	231	290	474	
Oats	Acres	21	25	42	
Small Grain Hay	Acres	66	82	136	
Sudan Grazing	Acres	66	83	132	
Small Grain Grazing	Acres	26	33	55	
Blue Panic-Sudan	Acres	0	0	2	
Fallow	Acres	14	18	28	
Feeders	Animal	134	167	273	
Operator Labor	Hour	1,220	1,292	1,547	
Hired Labor	Hour	263	430	977	
Investment					
Land and Buildings	Dollars	48,589	81,060	165,900	
Machinery	Dollars	12,420	12,420	12,420	
Operating Capital[b]	Dollars	22,243	28,063	46,739	
Total Capital Requirement	Dollars	83,252	121,543	227,195	
Gross Receipts	Dollars	14,092	17,598	28,798	
Operating and Overhead Expense	Dollars	7,029	8,887	15,786	
Return to Land[c]	Dollars	2,431	4,053	8,292	
Machinery Interest and Depreciation[d]	Dollars	1,466	1,466	1,466	
Return to Operator Labor and Management	Dollars	3,166	3,192	3,001	

No Solution

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE II

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[a]	$131.25	$157.50
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	915	1,108	1,668	4,652
Cropland	Acres	715	865	1,303	3,634
Cotton	Acres	86	103	156	436
Wheat	Acres	343	415	626	1,744
Oats	Acres	30	37	57	159
Small Grain Hay	Acres	99	119	180	500
Sudan Grazing	Acres	97	118	146	407
Small Grain Grazing	Acres	40	48	72	202
Blue Panic-Sudan	Acres	0	0	29	82
Fallow	Acres	20	26	37	104
Feeders	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	Dollars	72,056	116,326	218,925	732,690
Machinery	Dollars	15,720	15,720	19,182	53,498
Operating Capital[b]	Dollars	32,870	39,916	60,789	172,303
Total Capital Requirement	Dollars	120,646	161,962	298,896	958,491
Gross Receipts	Dollars	20,889	25,257	38,079	106,136
Operating and Overhead Expense	Dollars	10,217	12,345	19,854	58,185
Return to Land[c]	Dollars	3,605	5,816	10,942	36,611
Machinery Interest and Depreciation[d]	Dollars	1,855	1,855	2,268	6,327
Return to Operator Labor and Management	Dollars	5,212	5,241	5,015	5,013

APPENDIX C, TABLE II (Continued)

Item	Unit	Land Price Per Acre $78.75	$105.00[a]	$131.25	$157.50
Hired Labor at $1.50 Per Hour					
Total Land	Acres	959	1,193	2,538	
Cropland	Acres	750	932	1,983	
Cotton	Acres	90	112	238	
Wheat	Acres	360	447	952	
Oats	Acres	32	40	87	
Small Grain Hay	Acres	103	128	273	
Sudan Grazing	Acres	102	127	222	
Small Grain Grazing	Acres	42	51	110	
Blue Panic-Sudan	Acres	0	0	45	
Fallow	Acres	21	27	56	
Feeders	Animal	204	258	549	
Operator Labor	Hour	1,396	1,505	1,714	No Solution
Hired Labor	Hour	631	988	3,587	
Investment					
Land and Buildings	Dollars	75,521	125,265	333,113	
Machinery	Dollars	15,720	15,720	29,187	
Operating Capital[b]	Dollars	34,776	43,531	94,981	
Total Capital Requirement	Dollars	126,017	184,516	457,281	
Gross Receipts	Dollars	21,906	27,208	57,917	
Operating and Overhead Expense	Dollars	11,003	13,770	32,810	
Return to Land[c]	Dollars	3,778	6,263	16,649	
Machinery Interest and Depreciation[d]	Dollars	1,855	1,855	3,452	
Return to Operator Labor and Management	Dollars	5,270	5,320	5,006	

APPENDIX C, TABLE II (Continued)

Item	Unit	Land Price Per Acre $78.75	$105.00[a]	$131.25	$157.50
Hired Labor at $2.00 Per Hour					
Total Land	Acres	1,014	1,311		
Cropland	Acres	792	1,024		
Cotton	Acres	95	123		
Wheat	Acres	380	491		
Oats	Acres	33	45		
Small Grain Hay	Acres	109	141		
Sudan Grazing	Acres	108	117		
Small Grain Grazing	Acres	44	57		
Blue Panic-Sudan	Acres	0	21		
Fallow	Acres	23	29		
Feeders	Animal	220	282	No Solution	No Solution
Operator Labor	Hour	1,423	1,658		
Hired Labor	Hour	704	1,173		
Investment					
Land and Buildings	Dollars	79,853	137,655		
Machinery	Dollars	15,720	15,720		
Operating Capital[b]	Dollars	37,153	48,625		
Total Capital Requirement	Dollars	132,726	202,000		
Gross Receipts	Dollars	23,117	29,897		
Operating and Overhead Expense	Dollars	12,004	15,818		
Return to Land[c]	Dollars	3,995	6,883		
Machinery Interest and Depreciation[d]	Dollars	1,855	1,855		
Return to Operator Labor and Management	Dollars	5,263	5,341		

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE III

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[a]	$131.25	$157.50
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	1,259	1,543	2,610	7,552
Cropland	Acres	983	1,206	2,039	5,900
Cotton	Acres	118	144	245	708
Wheat	Acres	472	578	979	2,832
Oats	Acres	42	53	89	258
Small Grain Hay	Acres	135	166	281	811
Sudan Grazing	Acres	133	135	228	661
Small Grain Grazing	Acres	54	67	113	328
Blue Panic-Sudan	Acres	0	27	46	133
Fallow	Acres	29	36	58	169
Feeders	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	Dollars	99,146	162,054	342,563	1,189,440
Machinery	Dollars	18,975	18,975	30,015	86,848
Operating Capital[b]	Dollars	45,489	56,103	95,780	280,552
Total Capital Requirement	Dollars	163,610	237,132	468,358	1,556,840
Gross Receipts	Dollars	28,686	35,247	59,543	172,280
Operating and Overhead Expense	Dollars	14,228	17,674	31,871	76,425
Return to Land[c]	Dollars	4,960	8,103	17,122	78,587
Machinery Interest and Depreciation[d]	Dollars	2,239	2,239	3,550	10,271
Return to Operator Labor and Management	Dollars	7,259	7,231	7,000	6,997

APPENDIX C, TABLE III (Continued)

Item	Unit	Land Price Per Acre $78.75	$105.00[a]	$131.25	$157.50
Hired Labor at $1.50 Per Hour					
Total Land	Acres	1,351	1,726	4,670	
Cropland	Acres	1,055	1,348	3,648	
Cotton	Acres	127	162	438	
Wheat	Acres	507	647	1,751	
Oats	Acres	46	59	159	
Small Grain Hay	Acres	144	186	502	
Sudan Grazing	Acres	118	151	409	
Small Grain Grazing	Acres	59	75	203	
Blue Panic-Sudan	Acres	24	30	82	
Fallow	Acres	30	38	104	
Feeders	Animal	293	373	1,010	
Operator Labor	Hour	1,571	1,617	1,734	No Solution
Hired Labor	Hour	1,251	1,989	8,021	
Investment					
Land and Buildings	Dollars	106,391	181,230	612,938	
Machinery	Dollars	18,975	18,975	53,705	
Operating Capital[b]	Dollars	49,577	63,904	176,865	
Total Capital Requirement	Dollars	174,953	264,109	843,508	
Gross Receipts	Dollars	30,858	39,368	106,555	
Operating and Overhead Expense	Dollars	15,906	20,620	62,554	
Return to Land[c]	Dollars	5,323	9,062	30,635	
Machinery Interest and Depreciation[d]	Dollars	2,239	2,239	6,351	
Return to Operator Labor and Management	Dollars	7,390	7,447	7,015	

APPENDIX C, TABLE III (Continued)

Item	Unit	Land Price Per Acre $78.75	$105.00[a]	$131.25	$157.50
Hired Labor at $2.00 Per Hour					
Total Land	Acres	1,484	2,012		
Cropland	Acres	1,159	1,572		
Cotton	Acres	139	188		
Wheat	Acres	556	755		
Oats	Acres	51	69		
Small Grain Hay	Acres	160	216		
Sudan Grazing	Acres	130	176		
Small Grain Grazing	Acres	64	87		
Blue Panic-Sudan	Acres	26	36		
Fallow	Acres	33	45		
Feeders	Animal	321	435	No Solution	No Solution
Operator Labor	Hour	1,588	1,651		
Hired Labor	Hour	1,512	2,552		
Investment					
Land and Buildings	Dollars	116,855	211,260		
Machinery	Dollars	18,975	18,975		
Operating Capital[b]	Dollars	55,413	72,125		
Total Capital Requirement	Dollars	191,253	306,360		
Gross Receipts	Dollars	33,871	45,916		
Operating and Overhead Expense	Dollars	18,365	25,713		
Return to Land[c]	Dollars	5,847	10,563		
Machinery Interest and Depreciation[d]	Dollars	2,239	2,239		
Return to Operator Labor and Management	Dollars	7,420	7,401		

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE IV

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[a]	$300	$360
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	326	426	567	
Cropland	Acres	255	333	443	
Cotton	Acres	51	67	88	
Wheat	Acres	74	97	129	
Alfalfa	Acres	58	76	100	
Grain Sorghum	Acres	54	70	94	
Small Grain Hay	Acres	7	9	12	
Small Grain Grazing	Acres	11	15	20	
Reseeded Cropland	Acres	-	-	-	
Cows	Animal	3	4	6	
Feeders	Animal	28	36	48	
Operator Labor	Hour	1,331	1,339	1,457	
Hired Labor	Hour	0	213	390	
Investment					
Land and Buildings	Dollars	58,680	102,358	170,100	
Machinery	Dollars	9,170	9,170	9,170	
Operating Capital[b]	Dollars	7,471	9,933	13,413	
Total Capital Requirement	Dollars	75,321	121,461	192,683	
Gross Receipts	Dollars	11,071	14,484	19,274	
Operating and Overhead Expense	Dollars	3,965	5,131	6,687	
Return to Land[c]	Dollars	2,934	5,118	8,505	
Machinery Interest and Depreciation[d]	Dollars	1,082	1,082	1,082	
Return to Operator Labor and Management	Dollars	3,089	3,153	3,000	

No Solution

APPENDIX C, TABLE IV (Continued)

Item	Unit	Land Price Per Acre $180	$240[a]	$300	$360
Hired Labor at $1.50 Per Hour					
Total Land	Acres	326	430	612	
Cropland	Acres	255	336	478	
Cotton	Acres	51	67	96	
Wheat	Acres	78	97	139	
Alfalfa	Acres	58	76	108	
Grain Sorghum	Acres	54	71	101	
Small Grain Hay	Acres	7	9	13	
Small Grain Grazing	Acres	11	16	21	
Reseeded Cropland	Acres	-	-	-	
Cows	Animal	3	4	7	
Feeders	Animal	28	37	52	
Operator Labor	Hour	1,331	1,334	1,490	
Hired Labor	Hour	0	222	456	
Investment					No Solution
Land and Buildings	Dollars	58,680	103,200	183,600	
Machinery	Dollars	9,170	9,170	9,170	
Operating Capital[b]	Dollars	7,471	10,328	14,878	
Total Capital Requirement	Dollars	75,321	122,698	207,648	
Gross Receipts	Dollars	11,071	14,609	20,836	
Operating and Overhead Expense	Dollars	3,965	5,243	7,547	
Return to Land[c]	Dollars	2,934	5,160	9,180	
Machinery Interest and Depreciation[d]	Dollars	1,082	1,082	1,082	
Return to Operator Labor and Management	Dollars	3,089	3,124	3,027	

APPENDIX C, TABLE IV (Continued)

Item	Unit	Land Price Per Acre $180	$240[a]	$300	$360
Hired Labor at $2.00 Per Hour					
Total Land	Acres	326	435	684	
Cropland	Acres	255	340	534	
Cotton	Acres	51	68	107	
Wheat	Acres	74	99	155	
Alfalfa	Acres	58	76	121	
Grain Sorghum	Acres	53	72	112	
Small Grain Hay	Acres	7	9	14	
Small Grain Grazing	Acres	11	16	25	
Reseeded Cropland	Acres	-	-	-	
Cows	Animal	3	5	7	
Feeders	Animal	28	37	58	
Operator Labor	Hour	1,331	1,351	1,554	No Solution
Hired Labor	Hour	0	232	545	
Investment					
Land and Buildings	Dollars	58,680	104,400	205,200	
Machinery	Dollars	9,170	9,170	9,234	
Operating Capital[b]	Dollars	7,471	10,465	16,766	
Total Capital Requirement	Dollars	75,321	124,035	221,200	
Gross Receipts	Dollars	11,071	14,793	23,230	
Operating and Overhead Expense	Dollars	3,965	5,360	8,870	
Return to Land[c]	Dollars	2,934	5,220	10,260	
Machinery Interest and Depreciation[d]	Dollars	1,082	1,082	1,094	
Return to Operator Labor and Management	Dollars	3,089	3,131	3,006	

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE V

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[a]	$300	$360
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	514	684	1,179	
Cropland	Acres	401	535	921	
Cotton	Acres	80	107	184	
Wheat	Acres	117	155	267	
Alfalfa	Acres	91	121	209	
Grain Sorghum	Acres	85	113	195	
Small Grain Hay	Acres	10	14	24	
Small Grain Grazing	Acres	18	25	42	
Reseeded Cropland	Acres	-	-	-	
Cows	Animal	5	7	12	
Feeders	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	Dollars	92,520	164,244	353,700	
Machinery	Dollars	10,420	10,420	15,916	
Operating Capital[b]	Dollars	11,984	16,219	28,627	
Total Capital Requirement	Dollars	114,924	190,883	398,243	
Gross Receipts	Dollars	17,453	23,260	40,070	
Operating and Overhead Expense	Dollars	6,576	8,698	15,496	
Return to Land[c]	Dollars	4,626	8,212	17,685	
Machinery Interest and Depreciation[d]	Dollars	1,230	1,230	1,886	
Return to Operator Labor and Management	Dollars	5,021	5,120	5,003	

APPENDIX C, TABLE V (Continued)

Item	Unit	Land Price Per Acre $180	$240[a]	$300	$360
Hired Labor at $1.50 Per Hour					
Total Land	Acres	522	710	1,560	
Cropland	Acres	408	555	1,219	
Cotton	Acres	82	111	243	
Wheat	Acres	118	161	353	
Alfalfa	Acres	92	126	277	
Grain Sorghum	Acres	86	117	258	
Small Grain Hay	Acres	11	15	32	
Small Grain Grazing	Acres	19	25	56	
Reseeded Cropland	Acres	-	-	-	
Cows	Animal	6	7	16	
Feeders	Animal	44	60	133	
Operator Labor	Hour	1,498	1,573	1,714	
Hired Labor	Hour	188	583	2,257	
Investment					
Land and Buildings	Dollars	93,960	170,400	468,000	
Machinery	Dollars	10,420	10,420	21,060	
Operating Capital[b]	Dollars	12,281	17,851	39,324	
Total Capital Requirement	Dollars	116,661	198,671	528,384	
Gross Receipts	Dollars	17,744	24,134	53,036	
Operating and Overhead Expense	Dollars	6,650	9,243	22,107	
Return to Land[c]	Dollars	4,698	8,520	23,400	
Machinery Interest and Depreciation[d]	Dollars	1,230	1,230	2,496	
Return to Operator Labor and Management	Dollars	5,166	5,141	5,033	

No Solution

APPENDIX C, TABLE V (Continued)

Item	Unit	Land Price Per Acre $180	$240[a]	$300	$360
Hired Labor at $2.00 Per Hour					
Total Land	Acres	532	739	8,640	
Cropland	Acres	416	577	6,750	
Cotton	Acres	83	115	1,350	
Wheat	Acres	121	167	1,957	
Alfalfa	Acres	94	131	1,530	
Grain Sorghum	Acres	88	122	1,424	
Small Grain Hay	Acres	12	15	179	
Small Grain Grazing	Acres	12	27	310	
Reseeded Cropland	Acres	-	-	-	
Cows	Animal	6	7	90	
Feeders	Animal	45	63	736	
Operator Labor	Hour	1,514	1,592	1,714	
Hired Labor	Hour	203	611	19,068	
Investment					
Land and Buildings	Dollars	95,760	177,360	2,592,000	
Machinery	Dollars	10,420	10,420	116,640	
Operating Capital[b]	Dollars	12,655	18,242	237,493	
Total Capital Requirement	Dollars	118,835	206,022	2,946,133	
Gross Receipts	Dollars	18,105	25,099	293,656	
Operating and Overhead Expense	Dollars	6,870	9,757	145,235	
Return to Land[c]	Dollars	4,788	8,868	129,600	
Machinery Interest and Depreciation[d]	Dollars	1,230	1,230	13,824	
Return to Operator Labor and Management	Dollars	5,217	5,244	4,997	

No Solution

[a] Assumed current price.

[b] 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.

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

[d] Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE VI

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[a]	$300	$360
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	734	982	1,929	
Cropland	Acres	574	767	1,507	
Cotton	Acres	115	153	301	
Wheat	Acres	166	222	437	
Alfalfa	Acres	130	164	341	
Grain Sorghum	Acres	121	162	319	
Small Grain Hay	Acres	15	20	40	
Small Grain Grazing	Acres	27	35	69	
Reseeded Cropland	Acres	-	-	-	
Cows	Animal	8	10	20	
Feeders	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	Dollars	132,120	235,594	578,700	
Machinery	Dollars	14,315	14,315	26,042	
Operating Capital[b]	Dollars	17,366	23,572	47,466	
Total Capital Requirement	Dollars	163,801	273,481	652,208	
Gross Receipts	Dollars	24,946	33,363	65,547	
Operating and Overhead Expense	Dollars	9,657	12,778	26,525	
Return to Land[c]	Dollars	6,606	11,780	28,935	
Machinery Interest Depreciation[d]	Dollars	1,686	1,686	3,086	
Return to Operator Labor and Management	Dollars	6,997	7,119	7,001	

APPENDIX C, TABLE VI (Continued)

Item	Unit	Land Price Per Acre $180	$240[a]	$300	$360
Hired Labor at $1.50 Per Hour					
Total Land	Acres	756	1,040	2,925	
Cropland	Acres	591	813	2,285	
Cotton	Acres	118	162	457	
Wheat	Acres	171	236	663	
Alfalfa	Acres	134	184	518	
Grain Sorghum	Acres	125	171	482	
Small Grain Hay	Acres	16	22	60	
Small Grain Grazing	Acres	27	38	105	
Reseeded Cropland	Acres	-	-	-	
Cows	Animal	8	11	31	
Feeders	Animal	64	88	249	
Operator Labor	Hour	1,686	1,714	1,714	No Solution
Hired Labor	Hour	491	1,148	5,319	
Investment					
Land and Buildings	Dollars	136,080	249,600	877,500	
Machinery	Dollars	14,315	14,315	39,487	
Operating Capital[b]	Dollars	18,140	27,056	75,548	
Total Capital Requirement	Dollars	168,535	290,971	992,535	
Gross Receipts	Dollars	25,703	35,340	99,423	
Operating and Overhead Expense	Dollars	9,961	13,927	43,845	
Return to Land[c]	Dollars	6,804	12,480	43,875	
Machinery Interest and Depreciation[d]	Dollars	1,686	1,686	4,680	
Return to Operator Labor and Management	Dollars	7,252	7,247	7,023	

APPENDIX C, TABLE VI (Continued)

Item	Unit	Land Price Per Acre $180	$240[a]	$300	$360
Hired Labor at $2.00 Per Hour					
Total Land	Acres	781	1,117	27,785	
Cropland	Acres	610	873	21,706	
Cotton	Acres	122	174	4,340	
Wheat	Acres	177	253	6,293	
Alfalfa	Acres	138	198	4,921	
Grain Sorghum	Acres	129	184	4,580	
Small Grain Hay	Acres	16	23	574	
Small Grain Grazing	Acres	28	41	998	
Reseeded Cropland	Acres	-	-	-	
Cows	Animal	8	12	290	
Feeders	Animal	67	95	2,363	
Operator Labor	Hour	1,711	1,714	1,714	
Hired Labor	Hour	523	1,311	65,117	
Investment					
Land and Buildings	Dollars	140,580	268,080	8,335,500	
Machinery	Dollars	14,315	14,315	375,097	
Operating Capital[b]	Dollars	19,012	28,349	770,844	
Total Capital Requirement	Dollars	173,907	310,744	9,481,441	
Gross Receipts	Dollars	26,525	38,003	994,298	
Operating and Overhead Expense	Dollars	10,591	15,660	526,066	
Return to Land[c]	Dollars	7,029	13,404	416,775	
Machinery Interest and Depreciation[d]	Dollars	1,686	1,686	44,456	
Return to Operator Labor and Management	Dollars	7,219	7,253	7,001	

No Solution

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE VII

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[a]	$212.50	$255.00
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	617	885		
Cropland	Acres	482	691		
Cotton	Acres	91	131		
Wheat	Acres	164	235		
Alfalfa	Acres	46	66		
Grain Sorghum	Acres	86	122		
Small Grain Hay	Acres	20	28		
Small Grain Grazing	Acres	18	26		
Reseeded Cropland	Acres	58	83		
Cows	Animal	11	16		
Feeders	Animal	46	66		
Operator Labor	Hour	1,482	1,625	No Solution	No Solution
Hired Labor	Hour	187	530		
Investment					
Land and Buildings	Dollars	78,668	150,450		
Machinery	Dollars	14,315	14,948		
Operating Capital[b]	Dollars	14,111	20,469		
Total Capital Requirement	Dollars	107,094	185,867		
Gross Receipts	Dollars	16,061	23,000		
Operating and Overhead Expense	Dollars	7,404	10,757		
Return to Land[c]	Dollars	3,933	7,523		
Machinery Interest and Depreciation[d]	Dollars	1,719	1,719		
Return to Operator Labor and Management	Dollars	3,005	3,001		

APPENDIX C, TABLE VII (Continued)

Item	Unit	Land Price Per Acre $127.50	$170.00[a]	$212.50	$255.00
Hired Labor at $1.50 Per Hour					
Total Land	Acres	631	1,185		
Cropland	Acres	494	926		
Cotton	Acres	93	176		
Wheat	Acres	167	314		
Alfalfa	Acres	47	88		
Grain Sorghum	Acres	98	163		
Small Grain Hay	Acres	11	38		
Small Grain Grazing	Acres	17	35		
Reseeded Cropland	Acres	59	111		
Cows	Animal	11	21		
Feeders	Animal	45	87		
Operator Labor	Hour	1,498	1,681	No Solution	No Solution
Hired Labor	Hour	188	1,018		
Investment					
Land and Buildings	Dollars	80,452	189,500		
Machinery	Dollars	14,315	15,998		
Operating Capital[b]	Dollars	14,103	28,210		
Total Capital Requirement	Dollars	108,870	233,808		
Gross Receipts	Dollars	16,322	30,778		
Operating and Overhead Expense	Dollars	7,580	15,805		
Return to Land[c]	Dollars	4,023	10,072		
Machinery Interest and Depreciation[d]	Dollars	1,719	1,896		
Return to Operator Labor and Management	Dollars	3,000	3,004		

APPENDIX C, TABLE VII (Continued)

Item	Unit	Land Price Per Acre $127.50	$170.00[a]	$212.50	$255.00
Hired Labor at $2.00 Per Hour					
Total Land	Acres	646			
Cropland	Acres	504			
Cotton	Acres	95			
Wheat	Acres	172			
Alfalfa	Acres	48			
Grain Sorghum	Acres	100			
Small Grain Hay	Acres	11			
Small Grain Grazing	Acres	18			
Reseeded Cropland	Acres	61			
Cows	Animal	12			
Feeders	Animal	46			
Operator Labor	Hour	1,511	No Solution	No Solution	No Solution
Hired Labor	Hour	195			
Investment					
Land and Buildings	Dollars	82,365			
Machinery	Dollars	14,315			
Operating Capital[b]	Dollars	14,546			
Total Capital Requirement	Dollars	111,226			
Gross Receipts	Dollars	16,709			
Operating and Overhead Expense	Dollars	7,872			
Return to Land[c]	Dollars	4,118			
Machinery Interest and Depreciation[d]	Dollars	1,719			
Return to Operator Labor and Management	Dollars	3,000			

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE VIII

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	$127.50	$170.00[a]	$212.50	$255.00
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	948	2,114		
Cropland	Acres	740	1,652		
Cotton	Acres	140	314		
Wheat	Acres	251	562		
Alfalfa	Acres	71	157		
Grain Sorghum	Acres	131	291		
Small Grain Hay	Acres	30	68		
Small Grain Grazing	Acres	28	62		
Reseeded Cropland	Acres	89	198		
Cows	Animal	17	38		
Feeders	Animal	70	156		
Operator Labor	Hour	1,636	1,714	No Solution	No Solution
Hired Labor	Hour	632	2,695		
Investment					
Land and Buildings	Dollars	120,870	359,380		
Machinery	Dollars	15,720	28,539		
Operating Capital[b]	Dollars	21,979	50,239		
Total Capital Requirement	Dollars	158,569	438,158		
Gross Receipts	Dollars	24,621	54,845		
Operating and Overhead Expense	Dollars	11,685	28,487		
Return to Land[c]	Dollars	6,044	17,969		
Machinery Interest and Depreciation[d]	Dollars	1,885	3,382		
Return to Operator Labor and Management	Dollars	5,007	5,007		

APPENDIX C, TABLE VIII (Continued)

Item	Unit	Land Price Per Acre $127.50	$170.00[a]	$212.50	$255.00
Hired Labor at $1.50 Per Hour					
Total Land	Acres	1,003	5,340		
Cropland	Acres	784	4,172		
Cotton	Acres	149	792		
Wheat	Acres	266	1,418		
Alfalfa	Acres	74	396		
Grain Sorghum	Acres	138	824		
Small Grain Hay	Acres	32	91		
Small Grain Grazing	Acres	29	149		
Reseeded Cropland	Acres	94	501		
Cows	Animal	18	96		
Feeders	Animal	75	372		
Operator Labor	Hour	1,646	1,714	No Solution	No Solution
Hired Labor	Hour	722	9,288		
Investment					
Land and Buildings	Dollars	127,882	854,400		
Machinery	Dollars	15,720	72,090		
Operating Capital[b]	Dollars	23,125	130,265		
Total Capital Requirement	Dollars	166,727	1,056,755		
Gross Receipts	Dollars	26,055	137,631		
Operating and Overhead Expense	Dollars	12,772	78,703		
Return to Land[c]	Dollars	6,394	45,390		
Machinery Interest and Depreciation[d]	Dollars	1,885	8,544		
Return to Operator Labor and Management	Dollars	5,004	4,994		

APPENDIX C, TABLE VIII (Continued)

Item	Unit	Land Price Per Acre $127.50	$170.00	$212.50	$255.00
Hired Labor at $2.00 Per Hour					
Total Land	Acres	1,077			
Cropland	Acres	841			
Cotton	Acres	160			
Wheat	Acres	286			
Alfalfa	Acres	80			
Grain Sorghum	Acres	149			
Small Grain Hay	Acres	35			
Small Grain Grazing	Acres	31			
Reseeded Cropland	Acres	101			
Cows	Animal	19			
Feeders	Animal	80			
Operator Labor	Hour	1,660	No Solution	No Solution	No Solution
Hired Labor	Hour	837			
Investment					
Land and Buildings	Dollars	137,318			
Machinery	Dollars	15,720			
Operating Capital[b]	Dollars	25,923			
Total Capital Requirement	Dollars	168,961			
Gross Receipts	Dollars	27,964			
Operating and Overhead Expense	Dollars	14,212			
Return to Land[c]	Dollars	6,866			
Machinery Interest and Depreciation[d]	Dollars	1,885			
Return to Operator Labor and Management	Dollars	5,001			

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE IX

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[a]	$212.50	$255.00
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	1,337	3,450		
Cropland	Acres	1,044	2,696		
Cotton	Acres	198	512		
Wheat	Acres	355	916		
Alfalfa	Acres	99	256		
Grain Sorghum	Acres	184	474		
Small Grain Hay	Acres	43	111		
Small Grain Grazing	Acres	39	101		
Reseeded Cropland	Acres	125	324		
Cows	Animal	24	61		
Feeders	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	Dollars	170,468	586,500		
Machinery	Dollars	20,630	46,575		
Operating Capital[b]	Dollars	31,353	82,969		
Total Capital Requirement	Dollars	222,451	716,044		
Gross Receipts	Dollars	34,706	89,430		
Operating and Overhead Expense	Dollars	16,907	47,588		
Return to Land[c]	Dollars	8,523	29,325		
Machinery Interest and Depreciation[d]	Dollars	2,270	5,520		
Return to Operator Labor and Management	Dollars	7,006	6,997		

APPENDIX C, TABLE IX (Continued)

Item	Unit	Land Price Per Acre $127.50	$170.00[a]	$212.50	$255.00
Hired Labor at $1.50 Per Hour					
Total Land	Acres	1,452	10,010		
Cropland	Acres	1,134	7,820		
Cotton	Acres	215	1,485		
Wheat	Acres	386	2,659		
Alfalfa	Acres	108	743		
Grain Sorghum	Acres	200	1,545		
Small Grain Hay	Acres	47	171		
Small Grain Grazing	Acres	42	279		
Reseeded Cropland	Acres	136	939		
Cows	Animal	26	180		
Feeders	Animal	107	698		
Operator Labor	Hour	1,714	1,714	No Solution	No Solution
Hired Labor	Hour	1,466	18,911		
Investment					
Land and Buildings	Dollars	185,130	1,601,600		
Machinery	Dollars	20,630	135,135		
Operating Capital[b]	Dollars	34,864	261,424		
Total Capital Requirement	Dollars	240,624	1,998,159		
Gross Receipts	Dollars	37,677	257,951		
Operating and Overhead Expense	Dollars	19,146	149,857		
Return to Land[c]	Dollars	9,256	85,085		
Machinery Interest and Depreciation[d]	Dollars	2,270	16,016		
Return to Operator Labor and Management	Dollars	7,005	6,993		

APPENDIX C, TABLE IX (Continued)

Item	Unit	Land Price Per Acre $127.50	$170.00[a]	$212.50	$255.00
Hired Labor at $2.00 Per Hour					
Total Land	Acres	1,612			
Cropland	Acres	1,260			
Cotton	Acres	239			
Wheat	Acres	428			
Alfalfa	Acres	120			
Grain Sorghum	Acres	249			
Small Grain Hay	Acres	27			
Small Grain Grazing	Acres	45			
Reseeded Cropland	Acres	151			
Cows	Animal	29			
Feeders	Animal	113			
Operator Labor	Hour	1,714			
Hired Labor	Hour	1,733			
Investment					
Land and Buildings	Dollars	205,530	No Solution	No Solution	No Solution
Machinery	Dollars	30,630			
Operating Capital[b]	Dollars	38,611			
Total Capital Requirement	Dollars	264,771			
Gross Receipts	Dollars	41,600			
Operating and Overhead Expense	Dollars	22,095			
Return to Land[c]	Dollars	10,276			
Machinery Interest and Depreciation[d]	Dollars	2,220			
Return to Operator Labor and Management	Dollars	7,009			

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE X

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[a]	$200	$240
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	360	440	502	1,146
Cropland	Acres	281	344	392	896
Cotton	Acres	87	106	121	271
Wheat	Acres	36	45	51	116
Alfalfa	Acres	50	61	69	159
Grain Sorghum	Acres	26	32	36	83
Small Grain Hay	Acres	14	17	19	44
Small Grain Grazing	Acres	18	22	25	57
Reseeded Cropland	Acres	50	61	70	159
Cows	Animal	7	9	10	23
Feeders	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	Dollars	43,200	70,400	100,400	275,040
Machinery	Dollars	8,485	8,485	8,485	13,752
Operating Capital[b]	Dollars	11,544	14,205	16,262	38,187
Total Capital Requirement	Dollars	63,229	93,090	122,686	326,979
Gross Receipts	Dollars	12,199	14,909	17,007	38,856
Operating and Overhead Expense	Dollars	5,680	6,952	7,551	19,327
Return to Land[c]	Dollars	2,520	3,960	5,522	14,898
Machinery Interest and Depreciation[d]	Dollars	1,001	1,001	1,001	1,627
Return to Operator Labor and Management	Dollars	2,998	2,996	2,993	3,004

APPENDIX C, TABLE X (Continued)

Item	Unit	Land Price Per Acre $120	$160[a]	$200	$240
Hired Labor at $1.50 Per Hour					
Total Land	Acres	361	447	528	
Cropland	Acres	282	349	413	
Cotton	Acres	87	109	128	
Wheat	Acres	37	45	54	
Alfalfa	Acres	50	62	73	
Grain Sorghum	Acres	26	32	38	
Small Grain Hay	Acres	14	17	20	
Small Grain Grazing	Acres	18	22	26	
Reseeded Cropland	Acres	50	62	74	
Cows	Animal	7	9	10	
Feeders	Animal	38	47	56	
Operator Labor	Hour	1,352	1,405	1,532	No Solution
Hired Labor	Hour	28	127	221	
Investment					
Land and Buildings	Dollars	43,320	71,520	105,600	
Machinery	Dollars	8,485	8,485	8,485	
Operating Capital[b]	Dollars	11,599	14,400	17,248	
Total Capital Requirement	Dollars	63,404	94,405	131,333	
Gross Receipts	Dollars	12,244	15,160	17,904	
Operating and Overhead Expense	Dollars	5,439	7,135	8,095	
Return to Land[c]	Dollars	2,527	4,023	5,808	
Machinery Interest and Depreciation[d]	Dollars	1,001	1,001	1,001	
Return to Operator Labor and Management	Dollars	3,277	3,001	3,000	

APPENDIX C, TABLE X (Continued)

Item	Unit	Land Price Per Acre $120	$160[a]	$200	$240
Hired Labor at $2.00 Per Hour					
Total Land	Acres	362	455	564	
Cropland	Acres	283	356	442	
Cotton	Acres	88	111	137	
Wheat	Acres	37	46	57	
Alfalfa	Acres	51	63	79	
Grain Sorghum	Acres	26	33	41	
Small Grain Hay	Acres	14	17	22	
Small Grain Grazing	Acres	18	23	28	
Reseeded Cropland	Acres	50	63	78	
Cows	Animal	7	9	11	
Feeders	Animal	38	48	59	
Operator Labor	Hour	1,354	1,455	1,585	
Hired Labor	Hour	29	137	262	
Investment					
Land and Buildings	Dollars	43,440	72,800	112,800	
Machinery	Dollars	8,485	8,485	8,485	
Operating Capital[b]	Dollars	11,660	14,590	18,686	
Total Capital Requirement	Dollars	63,585	95,875	139,971	
Gross Receipts	Dollars	12,294	15,444	19,133	
Operating and Overhead Expense	Dollars	5,754	7,343	8,923	
Return to Land[c]	Dollars	2,534	4,095	6,204	
Machinery Interest and Depreciation[d]	Dollars	1,001	1,001	1,001	
Return to Operator Labor and Management	Dollars	3,005	3,005	3,005	

No Solution

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE XI

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[a]	$200	$240
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	610	753	1,056	2,874
Cropland	Acres	476	589	825	2,245
Cotton	Acres	148	182	256	696
Wheat	Acres	62	76	107	292
Alfalfa	Acres	85	104	146	398
Grain Sorghum	Acres	44	55	77	208
Small Grain Hay	Acres	23	29	40	110
Small Grain Grazing	Acres	30	38	53	143
Reseeded Cropland	Acres	84	104	146	398
Cows	Animal	12	15	21	57
Feeders	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	Dollars	73,200	120,480	211,200	689,760
Machinery	Dollars	13,356	13,356	13,356	34,488
Operating Capital[b]	Dollars	19,443	24,690	35,076	97,892
Total Capital Requirement	Dollars	105,989	158,526	239,632	822,140
Gross Receipts	Dollars	20,694	25,534	35,786	97,405
Operating and Overhead Expense	Dollars	10,455	12,933	18,655	53,842
Return to Land[c]	Dollars	3,660	6,024	10,550	34,488
Machinery Interest and Depreciation[d]	Dollars	1,576	1,576	1,576	4,081
Return to Operator Labor and Management	Dollars	5,002	5,000	4,995	4,994

APPENDIX C, TABLE XI (Continued)

Item	Unit	Land Price Per Acre $120	$160[a]	$200	$240
Hired Labor at $1.50 Per Hour					
Total Land	Acres	626	795	1,365	
Cropland	Acres	489	621	1,068	
Cotton	Acres	152	192	330	
Wheat	Acres	63	81	139	
Alfalfa	Acres	87	110	190	
Grain Sorghum	Acres	45	58	99	
Small Grain Hay	Acres	24	30	52	
Small Grain Grazing	Acres	31	40	68	
Reseeded Cropland	Acres	87	110	189	
Cows	Animal	12	16	27	
Feeders	Animal	66	84	143	
Operator Labor	Hour	1,639	1,714	1,714	No Solution
Hired Labor	Hour	334	636	1,912	
Investment					
Land and Buildings	Dollars	75,120	127,200	273,000	
Machinery	Dollars	13,356	13,356	16,380	
Operating Capital[b]	Dollars	20,564	26,443	46,664	
Total Capital Requirement	Dollars	109,040	166,999	336,044	
Gross Receipts	Dollars	21,226	26,953	46,282	
Operating and Overhead Expense	Dollars	10,894	13,922	25,687	
Return to Land[c]	Dollars	3,756	6,360	14,650	
Machinery Interest and Depreciation[d]	Dollars	1,576	1,576	1,938	
Return to Operator Labor and Management	Dollars	5,000	4,995	5,007	

APPENDIX C, TABLE XI (Continued)

Item	Unit	Land Price Per Acre $120	$160[a]	$200	$240
Hired Labor at $2.00 Per Hour					
Total Land	Acres	644	852	3,274	
Cropland	Acres	503	665	2,557	
Cotton	Acres	156	206	813	
Wheat	Acres	65	86	332	
Alfalfa	Acres	87	118	454	
Grain Sorghum	Acres	47	62	237	
Small Grain Hay	Acres	25	33	126	
Small Grain Grazing	Acres	32	42	163	
Reseeded Cropland	Acres	89	118	452	
Cows	Animal	13	16	65	
Feeders	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	Dollars	77,280	136,320	654,800	
Machinery	Dollars	13,356	13,356	39,288	
Operating Capital[b]	Dollars	21,335	27,836	118,489	
Total Capital Requirement	Dollars	111,971	177,512	802,577	
Gross Receipts	Dollars	21,821	28,715	110,971	
Operating and Overhead Expense	Dollars	11,383	15,333	68,581	
Return to Land[c]	Dollars	3,864	6,756	32,740	
Machinery Interest and Depreciation[d]	Dollars	1,576	1,576	4,649	
Return to Operator Labor and Management	Dollars	4,998	5,060	5,001	

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX C, TABLE XII

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[a]	$200	$240
Hired Labor at $1.00[a] Per Hour					
Total Land	Acres	840	1,053	1,676	4,646
Cropland	Acres	656	823	1,308	3,629
Cotton	Acres	203	255	406	1,125
Wheat	Acres	85	107	170	472
Alfalfa	Acres	117	146	232	644
Grain Sorghum	Acres	61	76	121	337
Small Grain Hay	Acres	32	40	64	178
Small Grain Grazing	Acres	42	52	84	232
Reseeded Cropland	Acres	116	146	231	642
Cows	Animal	17	21	33	92
Feeders	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	Dollars	100,800	168,480	335,200	1,115,040
Machinery	Dollars	14,761	14,761	20,112	55,752
Operating Capital[b]	Dollars	27,672	37,538	56,301	158,328
Total Capital Requirement	Dollars	143,233	220,779	411,693	1,329,120
Gross Receipts	Dollars	28,478	35,684	56,808	157,476
Operating and Overhead Expense	Dollars	14,695	18,523	30,669	88,128
Return to Land[c]	Dollars	5,040	8,424	16,760	55,752
Machinery Interest and Depreciation[d]	Dollars	1,741	1,741	2,380	6,597
Return to Operator Labor and Management	Dollars	7,000	6,995	6,999	6,999

APPENDIX C, TABLE XII (Continued)

Item	Unit	Land Price Per Acre $120	$160[a]	$200	$240
Hired Labor at $1.50 Per Hour					
Total Land	Acres	884	1,147	2,445	
Cropland	Acres	691	896	1,912	
Cotton	Acres	214	278	592	
Wheat	Acres	90	116	248	
Alfalfa	Acres	123	159	339	
Grain Sorghum	Acres	64	83	177	
Small Grain Hay	Acres	34	44	94	
Small Grain Grazing	Acres	44	57	122	
Reseeded Cropland	Acres	122	159	338	
Cows	Animal	17	23	48	
Feeders	Animal	93	121	256	
Operator Labor	Hour	1,714	1,714	1,714	
Hired Labor	Hour	836	1,425	4,603	
Investment					
Land and Buildings	Dollars	106,080	183,520	489,000	
Machinery	Dollars	14,761	14,761	29,340	
Operating Capital[b]	Dollars	29,599	30,917	85,350	
Total Capital Requirement	Dollars	150,440	237,198	603,690	
Gross Receipts	Dollars	29,968	38,873	82,889	
Operating and Overhead Expense	Dollars	15,882	20,960	47,962	
Return to Land[c]	Dollars	5,344	9,176	24,445	
Machinery Interest and Depreciation[d]	Dollars	1,741	1,741	3,472	
Return to Operator Labor and Management	Dollars	7,000	6,995	7,005	

No Solution

APPENDIX C, TABLE XII (Continued)

Item	Unit	Land Price Per Acre $120	$160[a]	$200	$240
Hired Labor at $2.00 Per Hour					
Total Land	Acres	939	1,276	7,750	
Cropland	Acres	732	997	6,056	
Cotton	Acres	227	309	1,876	
Wheat	Acres	95	129	707	
Alfalfa	Acres	130	177	1,074	
Grain Sorghum	Acres	68	92	562	
Small Grain Hay	Acres	36	49	277	
Small Grain Grazing	Acres	47	64	387	
Reseeded Cropland	Acres	130	177	1,073	
Cows	Animal	18	25	153	
Feeders	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	Dollars	112,680	204,160	1,550,000	
Machinery	Dollars	14,761	14,761	93,000	
Operating Capital[b]	Dollars	31,632	42,396	285,130	
Total Capital Requirement	Dollars	159,073	261,317	1,928,130	
Gross Receipts	Dollars	31,618	43,036	262,685	
Operating and Overhead Expense	Dollars	17,242	24,089	167,178	
Return to Land[c]	Dollars	5,634	10,208	77,500	
Machinery Interest and Depreciation[d]	Dollars	1,741	1,714	11,005	
Return to Operator Labor and Management	Dollars	7,000	6,997	7,001	

No Solution

[a]Assumed current price.

[b]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.

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

[d]Machinery interest is computed at six 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 twelve percent of the total investment from the total investment and dividing by 10 years.

APPENDIX D, 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 (780,850 Acres)

		Land Price Per Acre									
		$ 78.85					$105.00[b]				
Hired Labor Per Hour	Present Number of Farms	Cropland Requirement Per Farm	Maximum[a] Number of Farms Possible	Change From Present	Percentage Change	Present Number Above Level	Cropland Requirement Per Farm	Maximum[a] Number of Farms Possible	Change From Present	Percentage Change	Present Number Above Level
				$3,000 Return to Operator Labor and Management							
$1.00[b]	2,447	453	1,724	-723	-29.4	629	547	1,428	-1,019	-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	602	1,295	-1,152	-47.1	361
				$5,000 Return to Operator Labor and Management							
$1.00[b]	2,447	715	1,092	-1,355	-55.4	262	865	903	-1,544	-63.1	155
$1.50	2,447	750	1,041	-1,406	-57.5	230	932	838	-1,609	-65.8	125
$2.00	2,447	792	986	-1,461	-59.7	191	1,024	763	-1,686	-68.9	84
				$7,000 Return to Operator Labor and Management							
$1.00[b]	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

APPENDIX D, TABLE I (Continued)

Hired Labor Per Hour	Present Number of Farms	Land Price Per Acre: $131.25 Cropland Requirement Per Farm	$131.25 Maximum[a] Number of Farms Possible	$131.25 Change From Present	$131.25 Percentage Change	$131.25 Present Number Above Level	$157.50 Cropland Requirement Per Farm	$157.50 Maximum[a] Number of Farms Possible	$157.50 Change From Present	$157.50 Percentage Change	$157.50 Present Number Above Level
					$3,000 Return to Operator Labor and Management						
$1.00[b]	2,447	644	1,213	-1,234	-50.4	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[b]	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[b]	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				

[a]Number of farms possible if all farmers adjusted to this level, i.e., those above adjust downward and those below adjust upward.

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

APPENDIX D, TABLE II

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 (605,000 Acres)

Hired Labor Per Hour	Present Number of Farms	Land Price Per Acre: $180.00 Cropland Requirement Per Farm	$180.00 Maximum[a] Number of Farms Possible	$180.00 Change From Present	$180.00 Percentage Change	$180.00 Present Number Above Level	$240.00[b] Cropland Requirement Per Farm	$240.00[b] Maximum[a] Number of Farms Possible	$240.00[b] Change From Present	$240.00[b] Percentage Change	$240.00[b] Present Number Above Level
$3,000 Return to Operator Labor and Management											
$1.00[b]	2,361	255	2,373	+12	+.5	944	333	1,817	-544	-23.0	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[b]	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[b]	2,361	574	1,056	-1,305	-55.3	245	767	788	-1,573	-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

APPENDIX D, TABLE II (Continued)

Hired Labor Per Hour	Present Number of Farms	Cropland Requirement Per Farm	Maximum[a] Number of Farms Possible	Change From Present	Percentage Change	Present Number Above Level	Cropland Requirement Per Farm	Maximum[a] Number of Farms Possible	Change	Percentage Change	Present Number Above Level
		Land Price Per Acre									
		$3,000 Return to Operator Labor and Management									
$1.00[b]	2,361	443	1,366	-995	-42.1	414	No Solution	No Solution	No Solution	No Solution	No Solution
$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[b]	2,361	921	657	-1,707	-72.3	68	No Solution	No Solution	No Solution	No Solution	No Solution
$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	No Solution	No Solution	No Solution	No Solution	No Solution
$1.50	2,361	2,285	265	-2,096	-88.8	10					
$2.00	2,361	21,706	28	-2,333	-98.8	0					

[a]Number of farms possible if all farmers adjusted to this level, i.e., those above adjust downward and those below adjust upward.

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

APPENDIX D, TABLE III

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 PRECENTAGE CHANGE IF ALL FARMERS ADJUST, AND NUMBER OF FARMS CURRENTLY ABOVE LEVEL; ROLLING LOAM SOILS OF LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

Total Cropland (365,280 Acres)

Hired Labor Per Hour	Present Number of Farms	Cropland Requirement Per Farm	Maximum[a] Number of Farms Possible	Change From Present	Percentage Change	Present Number Above Level	Cropland Requirement Per Farm	Maximum[a] Number of Farms Possible	Change From Present	Percentage Change	Present Number Above Level
				$3,000 Return to Operator Labor and Management							
$1.00[b]	1,771	482	758	-1,016	-57.4	137	691	529	-1,242	-70.1	33
$1.50	1,771	494	739	-1,032	-58.3	128	926	394	-1,377	-77.8	9
$2.00	1,771	504	725	-1,046	-59.1	121	No Solution				
				$5,000 Return to Operator Labor and Management							
$1.00[b]	1,771	740	494	-1,277	-72.1	26	1,652	221	-1,550	-87.5	0
$1.50	1,771	784	466	-1,305	-73.7	22	4,172	88	-1,683	-95.0	0
$2.00	1,771	841	434	-1,337	-75.5	16	No Solution				
				$7,000 Return to Operator Labor and Management							
$1.00[b]	1,771	1,044	350	-1,421	-80.2	0	2,696	135	-1,636	-92.4	0
$1.50	1,771	1,134	322	-1,449	-81.8	0	7,820	47	-1,724	-97.3	0
$2.00	1,771	1,260	290	-1,481	-83.6	0	No Solution				

[a]Number of farms possible if all farmers adjusted to this level, i.e., those above adjust downward and those below adjust upward.

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

APPENDIX D, TABLE IV

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)

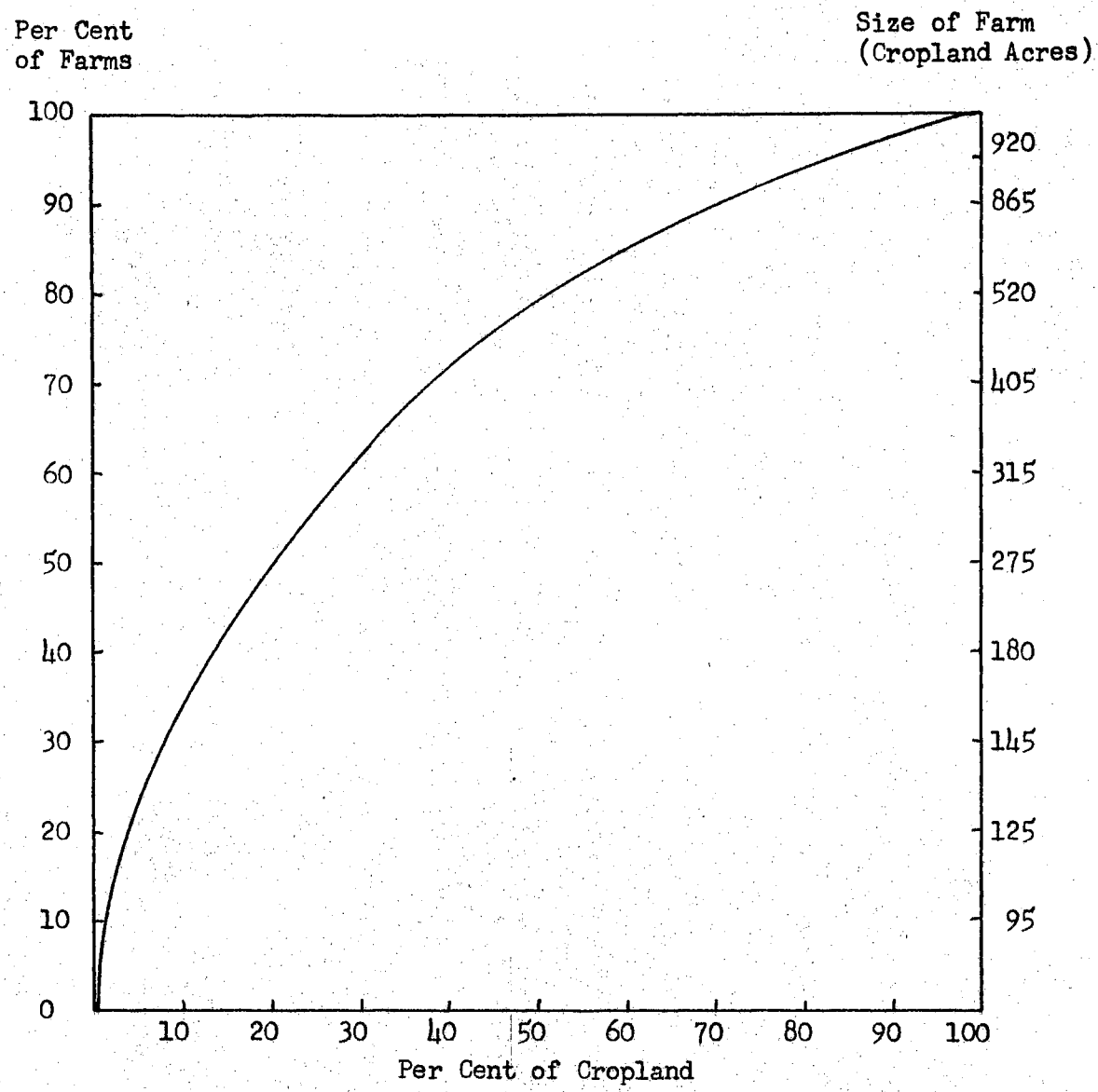
Hired Labor Per Hour	Present Number of Farms	Land Price Per Acre: $120.00 Cropland Requirement Per Farm	$120.00 Maximum[a] Number of Farms Possible	$120.00 Change From Present	$120.00 Percentage Change	$120.00 Present Number Above Level	Land Price Per Acre: $160.00[b] Cropland Requirement Per Farm	$160.00[b] Maximum[a] Number of Farms Possible	$160.00[b] Change From Present	$160.00[b] Percentage Change	$160.00[b] Present Number Above Level
$3,000 Return to Operator Labor and Management											
$1.00[b]	2,684	281	1,913	-771	-28.7	650	344	1,562	-1,122	-41.8	432
$1.50	2,684	282	1,906	-778	-29.0	650	349	1,540	-1,144	-42.4	420
$2.00	2,684	283	1,899	-785	-29.2	650	356	1,510	-1,174	-43.7	402
$5,000 Return to Operator Labor and Management											
$1.00[b]	2,684	476	1,129	-1,555	-57.9	175	589	913	-1,771	-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	503	1,069	-1,615	-60.2	140	665	808	-1,876	-69.9	71
$7,000 Return to Operator Labor and Management											
$1.00[b]	2,684	656	819	-1,865	-69.5	72	823	653	-2,031	-75.7	36
$1.50	2,684	691	778	-1,906	-71.0	66	896	600	-2,084	-77.6	21
$2.00	2,684	732	734	-1,950	-72.7	57	997	539	-2,145	-79.9	21

APPENDIX D, TABLE IV (Continued)

Hired Labor Per Hour	Present Number of Farms	Land Price Per Acre: $120.00 Cropland Requirement Per Farm	$120.00 Maximum[a] Number of Farms Possible	$120.00 Change From Present	$120.00 Percentage Change	$120.00 Present Number Above Level	$160.00[b] Cropland Requirement Per Farm	$160.00[b] Maximum[a] Number of Farms Possible	$160.00[b] Change From Present	$160.00[b] Percentage Change	$160.00[b] Present Number Above Level
$3,000 Return to Operator Labor and Management											
$1.00[b]	2,684	392	1,371	-1,313	-48.9	304	896	600	-2,084	-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	-54.5	224	No Solution				
$5,000 Return to Operator Labor and Management											
$1.00[b]	2,684	825	652	-2,032	-75.7	35	2,245	239	-2,445	-91.1	0
$1.50	2,684	1,068	503	-2,181	-81.3	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[b]	2,684	1,308	411	-2,273	-84.7	14	3,629	148	-2,536	-94.5	0
$1.50	2,684	1,912	281	-2,403	-89.5	8	No Solution				
$2.00	2,684	6,056	88	-2,596	-96.7	0	No Solution				

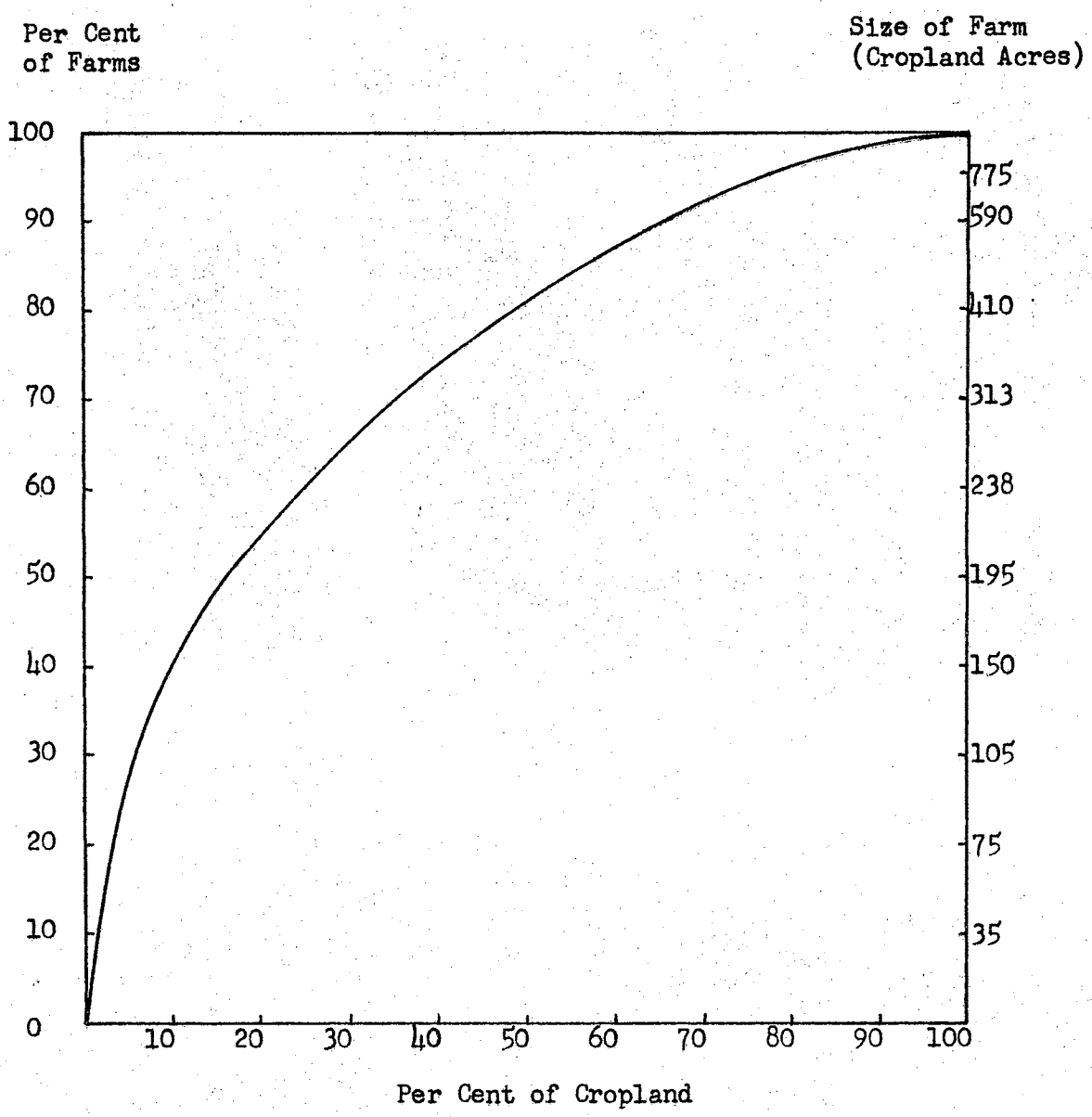
[a]Number of farms possible if all farmers adjusted to this level, i.e., those above adjust downward and those below adjust upward.

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



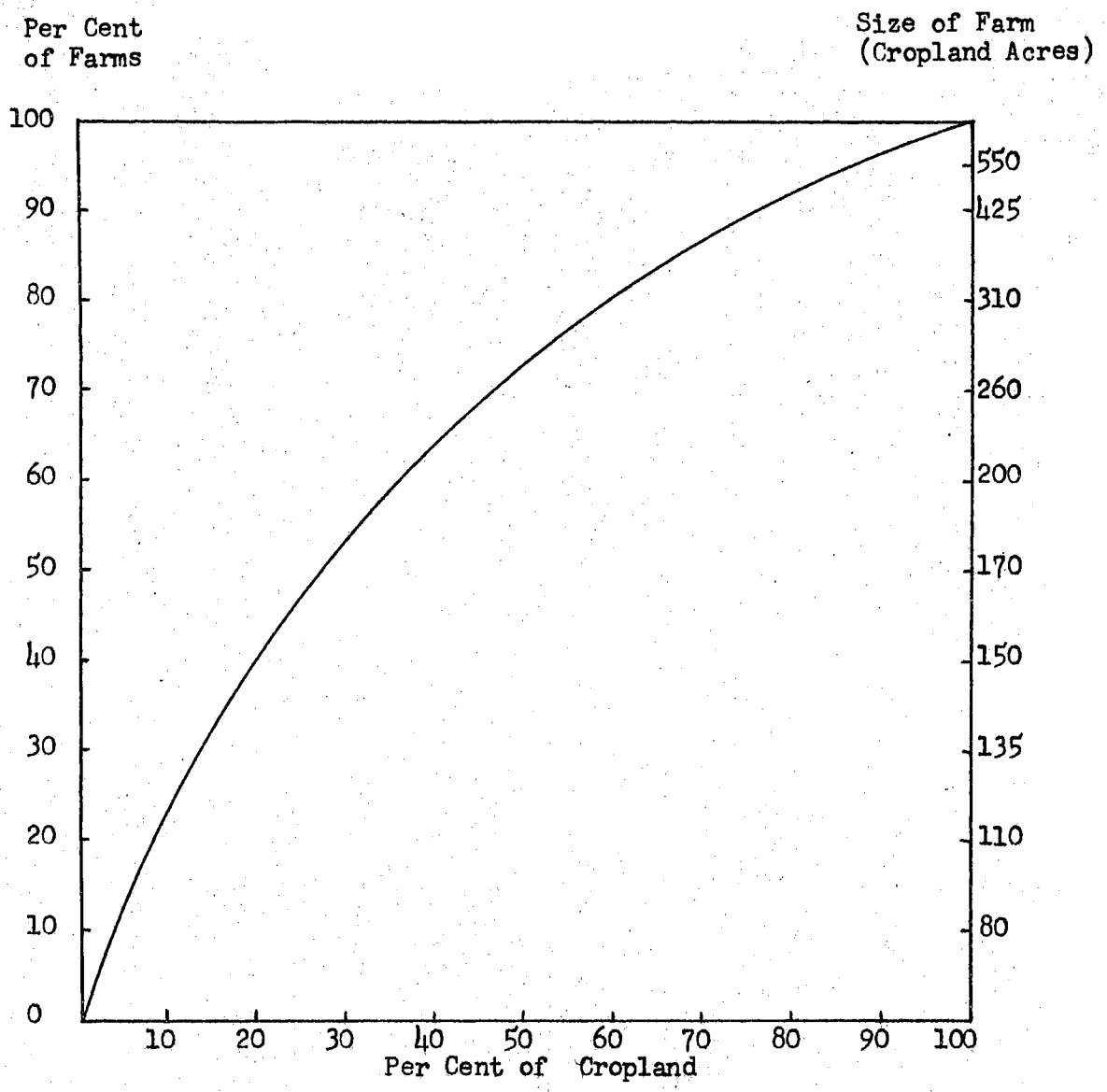
TOTAL FARMS - 2447, TOTAL CROPLAND - 780,850 acres

Appendix D, Figure 1. Estimated Current Percentage Distribution of Farms by Size, Clay Soils of the Low Rolling Plains of Southwestern Oklahoma.



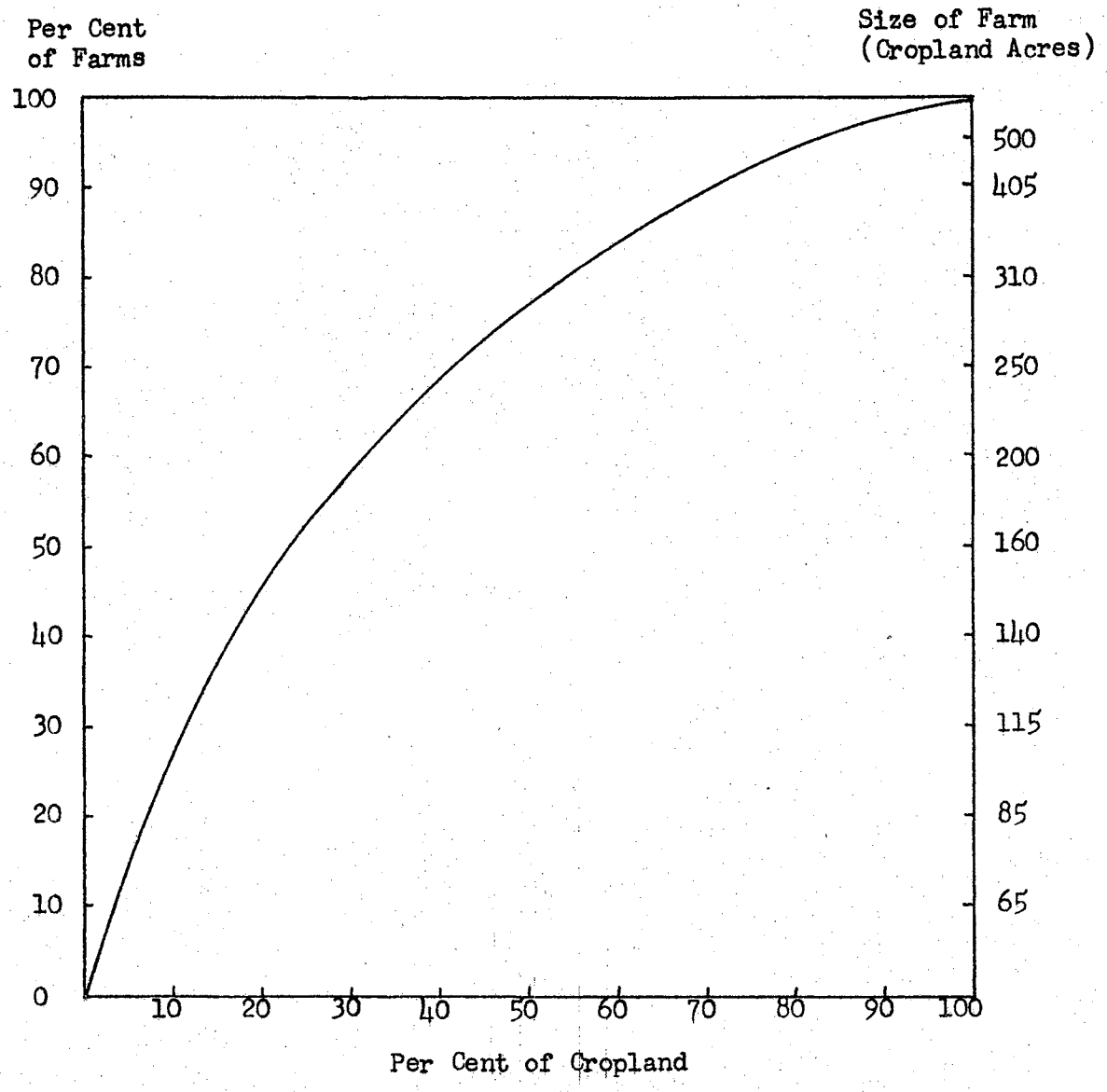
TOTAL FARMS - 2360, TOTAL CROPLAND - 605,000 acres

Appendix D, Figure 2. Estimated Current Percentage Distribution of Farms by Size, Level Loam Soils of the Low Rolling Plains of Southwestern Oklahoma.



TOTAL FARMS - 1771, TOTAL CROPLAND - 365,280 acres

Appendix D, Figure 3. Estimated Current Percentage Distribution of Farms by Size, Rolling Loam Soils of the Low Rolling Plains of Southwestern Oklahoma.



TOTAL FARMS - 2683, TOTAL CROPLAND - 537,548 acres

Appendix D, Figure 4. Estimated Current Percentage Disbribution of Farms by Size, Sandy Soils of the Low Rolling Plains of Southwestern Oklahoma.

APPENDIX E, TABLE I

ESTIMATED MINIMUM RESOURCE REQUIREMENTS TO OBTAIN SPECIFIED RETURNS TO OPERATOR OWNED RESOURCES,[a] CLAY SOILS OF LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA, CURRENT LAND ($105 PER ACRE) AND HIRED LABOR ($1.00 PER HOUR) PRICES

Item	Net Returns		
	$3,000	$5,000	$7,000
Total land	576	1,043	1,549
Cropland	450	814	1,211
Land purchased	416	883	1,389
Crops			
Cotton	54	98	145
Wheat	216	391	581
Oats	19	35	53
Small grain hay	61	112	166
Small grain grazing	25	45	67
Sudan grazing	61	111	136
Blue Panic Sudan	-	-	27
Fallow	13	23	35
Feeders	124	225	355
Operator Labor	1,205	1,448	1,595
Hired Labor	218	750	1,638
Investment in land owned	16,800	16,800	16,800
Value of land purchased	43,680	92,715	145,845
Machinery investment	12,420	15,720	18,975
Operating Capital	20,428	37,496	56,255
Gross Receipts	13,120	23,778	35,328
Operating and Overhead Expense	6,301	11,600	17,549
Land payment[b]	2,729	5,792	9,112
Machinery Depreciation	1,093	1,383	1,670
Return to Operator	2,997	5,003	6,997

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

[b]The purchased land is amortized at five percent interest for 33 years.

APPENDIX E, TABLE II

ESTIMATED MINIMUM RESOURCE REQUIREMENTS TO OBTAIN SPECIFIED RETURNS TO OPERATOR OWNED RESOURCES,[a] LEVEL LOAM SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA, CURRENT LAND ($240 PER ACRE) AND HIRED LABOR ($1.00 PER HOUR) PRICES

Item	Net Returns		
	$3,000	$5,000	$7,000
Total land	237	569	984
Cropland	185	443	768
Land purchased	77	409	824
Crops			
Cotton	37	89	154
Wheat	53	128	223
Alfalfa	43	101	175
Grain sorghum	39	93	162
Small grain hay	5	12	20
Small grain grazing	9	20	35
Cows	2	6	10
Feeders	20	48	84
Operator Labor	1,050	1,496	1,714
Hired Labor	0	316	960
Investment in land owned	38,400	38,400	38,400
Value of land purchased	18,480	98,160	197,670
Machinery investment	9,170	10,420	14,315
Operating capital	5,412	13,397	23,621
Gross Receipts	7,999	19,341	33,448
Operating and Overhead Expense	3,027	7,280	12,827
Land payment[b]	1,155	6,139	12,365
Machinery Depreciation	806	916	1,259
Return to Operator	3,011	5,006	6,997

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

[b]The purchased land is amortized at five percent interest for 33 years.

APPENDIX E, TABLE III

ESTIMATED MINIMUM RESOURCE REQUIREMENTS TO OBTAIN SPECIFIED RETURNS TO OPERATOR OWNED RESOURCES,[a] ROLLING LOAM SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN, CURRENT LAND ($170 PER ACRE) AND HIRED LABOR ($1.00 PER HOUR) PRICES

Item	Net Returns		
	$3,000	$5,000	$7,000
Total land	760	1,717	2,836
Cropland	593	1,341	2,216
Land purchased	600	1,557	2,676
Crops			
Cotton	113	255	421
Wheat	201	456	753
Alfalfa	57	128	211
Grain sorghum	105	237	391
Small grain hay	24	55	91
Small grain grazing	22	50	83
Reseeded cropland	71	161	266
Cows	13	31	50
Feeders	57	127	209
Operator labor	1,606	1,714	1,714
Hired labor	328	1,946	4,198
Investment in land owned	27,200	27,200	27,200
Value of land purchased	102,000	264,690	428,160
Machinery investment	12,315	15,720	20,630
Operating Capital	17,438	40,541	67,896
Gross Receipts	19,768	44,551	73,533
Operating and Overhead Expense	9,079	21,637	36,276
Land payment[b]	6,372	16,535	28,419
Machinery Depreciation	1,240	1,383	1,815
Return to Operator	3,122	4,996	7,023

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

[b]The purchased land is amortized at five percent interest for 33 years.

APPENDIX E, TABLE IV

ESTIMATED MINIMUM RESOURCE REQUIREMENTS TO OBTAIN SPECIFIED RETURNS TO OPERATOR OWNED RESOURCES,[a] SANDY SOILS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA, CURRENT LAND ($160 PER ACRE) AND HIRED LABOR ($1.00 PER HOUR) PRICES

Item	Net Returns		
	$3,000	$5,000	$7,000
Total land	302	673	1,062
Cropland	236	525	829
Land purchased	142	513	902
Crops			
Cotton	74	163	257
Wheat	30	68	108
Alfalfa	42	93	147
Grain sorghum	22	49	77
Small grain hay	24	26	41
Small grain grazing	16	34	53
Reseeded cropland	29	93	146
Cows	2	13	21
Feeders	47	71	112
Operator Labor	1,271	1,690	1,714
Hired Labor	0	396	1,241
Investment in land owned	25,600	25,600	25,600
Investment in land purchased	22,720	82,080	144,320
Machinery investment	8,450	13,356	14,761
Operating capital	11,541	21,572	35,326
Gross Receipts	10,915	22,524	36,036
Operating and Overhead Expense	5,405	11,131	18,713
Land payment[b]	1,428	5,127	9,025
Machinery Depreciation	1,001	1,175	1,297
Return to Operator	3,051	5,091	7,001

[a]Operator labor and managmement, 160 acres of land and farm machinery.

[b]The purchased land is amortized at five percent interest for 33 years.

VITA

Percy Leo Strickland, Jr.

Candidate for the Degree of

Doctor of Philosophy

Thesis: MINIMUM RESOURCE REQUIREMENTS AND RESOURCE ADJUSTMENTS FOR SPECIFIED FARM INCOME LEVELS, LOW ROLLING PLAINS OF SOUTHWESTERN OKLAHOMA

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Biographical:

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