SUGGESTED ORGANIZATIONS FOR BEEF-WHEAT 320 ACRE AND 480 ACRE FARMS IN SOUTHEASTERN KANSAS

by

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INTRODUCTION

Kansas agriculture has changed greatly in the last half century. The society of agricultural people has been settled a relatively short time and has been exposed to many pronounced and revolutionary technological advances. As combines, tractors, improved crop varieties, agricultural chemicals, fertilizers, and other continuous advances in production technique were adopted, change has become the rule rather than the exception. These advances in farm production have brought about larger investment in land, machinery, and equipment and the need of greater skill in the management of a farm.

Figure 1 gives the Type-of-Farming Areas in Kansas and shows the variations in agricultural production. For example, Type-of-Farming Area 2 in the eastern part of the state, produces more corn, oats, alfalfa, and less wheat. These crops fit well in dairy and livestock enterprises. Type-of-Farming Area 12 in the western part of the state produces considerable wheat and grain sorghum along with range livestock.

Over the years production areas for certain crops have changed. For example 40 to 50 years ago, considerable land was planted to corn in central and southwestern Kansas, however, "by 1945-49 no county in the southwestern third of the state harvested as much as 5,000 acres (corn) per year and even in central Kansas the acreage devoted to corn was a small fraction of that

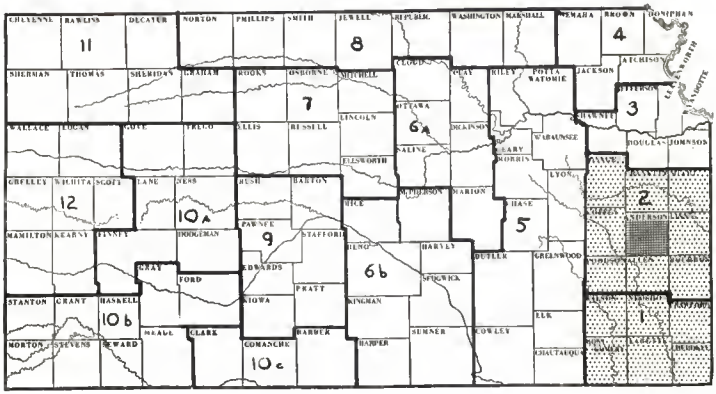

Fig. 1. Type-of-Farming Areas in Kansas. Source: Leo M. Hoover, Kansas Agriculture After 100 Years, Kansas Agricultural Experiment Station Bulletin 392, p. 18.

Area 1--Cash grain, livestock, dairy, general, part-time and residential farms. Wheat, corn, oats in order.
Area 2--Livestock, cash grain, dairy, general. Corn, wheat, oats.
Area 3--Cash grain, livestock, dairy, general, part-time and residential. Corn, wheat, oats, hay.
Area 4--Cash grain, livestock, general, dairy. Part of the Corn Belt.
Area 5--Range livestock, cash grain, general, dairy. Wheat, sorghums, hay.
Area 6a--Cash grain, livestock, general. Wheat, sorghums, hay, some corn.
Area 6b--Similar to 6a, more wheat, less corn, less pasture, less livestock but more dairying.
Area 7--Cash grain, livestock, general. Wheat, sorghums, very little corn.
Area 8--Cash grain, livestock, general. More hay and much more corn that Area 6 or 7.
Area 9--Cash grain, some livestock and general. High percentage in cropland, wheat dominant.
Area 10a--Cash grain, livestock, some general. Wheat and grain sorghums.
Area 10b--More cash grain, less livestock and general than 10a. Sorghums more important.
Area 10c--Less cash grain, more livestock, especially range livestock, than 10a or 10b.
Area 11--Cash grain, livestock, general. Wheat, sorghums, some corn.
Area 12--Cash grain, range livestock, some general. Wheat, sorghums. Average size largest of all areas.

used for wheat production."[1]

The produotivity of farmers has shown a remarkable increase. Agriculture production has exceeded the necessary requirements of food and fiber for the growing population as evidenced by present agricultural surpluses. However, with adequate production, or rather over-production in recent decades, the farmer has been required to direct his interest toward keeping pace with industrial and social changes in the economy as the latter advance their standards of living.

An indication of the importance of agriculture in Kansas is suggested by cash farm income from marketings and government payments in 1958 amounting to a little over 1.2 billion dollars. Of this amount, livestock and livestock produots accounted for 46 percent; crops, 51 percent; and government payments, 3 percent.[2]

Over the years, Kansas farmers have operated under conditions which are of lesser concern to non-farm business. Not only are farm businesses subject to fluotuation in the prices of many of the commodities they sell, but are directly affected by weather hazards. Drought, hail, wind, and floods are of constant concern to farmers.

The prevailing trend in agriculture business necessitates increasing the amount of farm income spent on produotion relative

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1. L. M. Hoover, Kansas Agriculture After 100 Years, Kansas Agricultural Experiment Station Bulletin 392, p. 34.
2. U.S. Department of Agriculture, Agricultural Marketing Service, Farm Income Situation, February 1960.

to the amount spent for family consumption. "A relatively large increase in production expenses has caused net farm income to decline during the period since World War II, despite the fact that gross farm income has increased."[1] This cost-price squeeze which has developed in agriculture is making it more difficult than ever for farmers to obtain adequate farm incomes.[2]

The cost-price squeeze is well described by the following:

> That realized gross income of farmers in the United States during the post-war period has varied from a low of $31.8 billion in 1949 to a high of $38.3 billion in 1958. Although there has been considerable variation from year to year, the trend has been upward. Production expenses of farmers have been increasing rather persistently and at a rapid rate, varying from a low of $17.2 billion in 1947 to a high of $26 billion in 1959. With production expenses increasing at a much more rapid rate than realized gross income, realized net income declined sharply. Aggregate realized net income fluctuated between a high of $16.8 billion in 1947 and a low of $11 billion in 1959.[3]

These problems which are continually confronting farmers, are making it necessary for those engaged in agriculture to make adjustments. For some it means leaving the farm and finding employment in other business. Those remaining must concentrate their efforts on selecting the proper enterprise combinations and producing their chosen products by the most efficient methods. These farm problems are not peculiar to any one area in the United States or Kansas, but apply to all the sectors of the farm

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1. "Agriculture Growth and the Rural Economy," Monthly Review, Federal Reserve Bank of Kansas City, June 1960, p. 3.
2. The term "cost-price squeeze" is the ever-increasing cost of production items farmers buy, with the gross income of farmers remaining the same or declining.
3. "Agriculture Growth and the Rural Economy", op. cit., pp. 3,4.

economy. However, there are some areas where these farm problems appear to be more serious.

The Problem

Statements have been made by those informed on farming conditions in Kansas, that perhaps one of the crucial farm problem areas in this state is in southeastern Kansas. This is well verified by a statement of Professor D. A. Knight, Department of Agricultural Economics, Kansas State University, in which he states:

> The problems of Anderson County farms are representative of those for many farms in southeast Kansas. Farms are small, the stock of available resources is limited, and incomes of many farmers are low. To increase their incomes the farmers must make certain adjustments in the quantities Although a few farms realized high incomes as defined here, the incomes on many farms were low. More than one half (54.7%) had incomes of less than $6,000 and almost one fourth had incomes of less than $3,000. Approximately three fourths of the farmers had incomes of less than $8,000 and the income of these farmers was only slightly more than 50 percent of the total.[1]

Incomes in this statement refer to gross farm income. If farm expenses are estimated at 59 percent of gross farm income, it is apparent that the net farm incomes are too low on many farms.[2]

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1. Dale A. Knight, Resource Use and Productivity and Farm Income, Anderson County, Kansas, 1950, Kansas Agricultural Experiment Station, Agricultural Economics Report 88, p. 1.

2. Farm Management Association records for 1950 for type of farming area 2 (Anderson County is in this area) showed that farm expenses were 59 percent of gross farm income. It is acknowledged that farms in these Farm Management Associations are larger and perhaps better managed than the average farm in the area, however, this 59 percent may not "Be too much in error for all farms in the area." Farm Management Summary and Analysis, 1950, Report by Type-of-Farming Area, Kansas Agricultural Experiment Station, Agricultural Economics Report 41.

It was thought that a study of this nature could best be developed if one representative county were studied instead of all 15 counties in southeast Kansas (Type-of-Farming Area 1 and 2). Anderson was selected as this representative county. The previous quotation stated that "The problems of Anderson County farms are representative of those for many farms in south east Kansas." This county posseeses typical charaoteristics of southeast Kansas. Table 1 shows the land distribution to be very near the averages computed for the distribution of Type-of-Farming Areas 1 and 2 combined. Fortunately recent studies were available for Anderson County with regard to crop and livestock production requirements.[1] Because Anderson County lies near the center of the area studied, it was assumed that data from these previous studies in this county would provide more accurate information than could be obtained by any other means. Anderson County is also subject to average climatic conditions, soil fertility, and topographical features which are similar to other parts of the area studied. It had within it, a representative of nearly every general soil type in Southeast Kansas.[2]

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1. Studies published on farming in Anderson County and relative to this thesis include: (a) Dale A. Knight, Practices and Requirements for the Production of Farm Crops, Anderson County, Kansas, 1950, Kansas Agricultural Experiment Station, Agricultural Economics Report 65; (b) Dale A. Knight, Beef Cattle Production in Anderson and Labette Counties, Kansas, 1950, Kansas Agricultural Experiment Station, Agricultural Economics Report 76; (c) Dale A. Knight, Resource Use and Productivity and Farm Income, Anderson County, Kansas, 1950, Kansas Agricultural Experiment Station, Agricultural Economics Report 88.

2. O. W. Bidwell, Major Soils in Kansas, Kansas Agricultural Experiment Station Circular 336.

Table 1. Acreage and percent distribution of land in combined Typee-of-Farming Areas 1 and 2, and Anderson County, 1954.

Land Use[1]	Type-of-Farming Areas 1 and 2		Anderson County	
	Acres	% Total Land	Acres	% Total Land
Total cropland	2,761,980	52.4	175,166	52.7
Total land pastured	2,324,626	44.1	139,990	42.1
Cropland pastured	184,466	3.5	5,766	1.7
Pasture other than cpld.	2,140,160	40.6	134,224	40.4
Lots, waste, roads, etc.	276,670	5.2	16,145	4.9
Woodland not pastured	95,000	1.8	6,633	2.0
Total nonproductive land	371,670	7.0	22,778	6.9
Total land in farms	5,273,810	100.0	332,168	100.0

1. Source: 1954 Census of Agriculture, U.S. Department of Commerce.

The problem for this study was that the financial returns for farming on many farms in Anderson County were too low. In order to attack this problem it was first necessary to consider elements responsible for these unfavorable farm incomes. There were many causes for this, among the more important were: low prices for farm products, high production costs, natural hazards resulting in low farm production, too many and too small farm enterprises, wrong enterprise, insufficient capital, lack of managerial ability on the part of the farmer, size of farm acreage too small, etc. Of all these responsible factors mentioned, this study was concerned, however, only with: (a) farm acreages too small, and (b) organization of the farm enterprises (too many enterprises, enterprises too small and not the proper combination of enterprises).

Objectives

The purpose of this study was to offer some answers to the problem which has just been stated. The suggested solutions given here have not, of course, exhausted all the possible answers which could have been given. A study of this kind must have some limitations. However, this study did offer some concrete suggestions which should be helpful to farmers in southeastern Kansas.

Specifically the objectives of this study were:

1. Select farm sizes of adequate acreage.

2. For each size of farm the following farm organizations were developed:[1]

   (a) General farm - (livestock-cash grain)

   (b) Primarily livestock, some cash grain

   (c) Primarily cash grain, some livestock

The general hypothesis of this study was that farm organizations for 320 and 480 acre farms in Anderson County, Kansas, could be developed which would provide an adequate farm income. The reasoning here was that by setting up these various indicated farm organizations for these two size farms, an evaluation was possible as to the probable farm returns. These various farm organizations

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1. Farm organization as used in this manuscript refers to a combination of farm enterprises. Farm organization is also frequently used in a different context, that is referring to groups of farmers organized for some political, professional or social objective, as for example, the Farm Bureau, the Farmers Union or the Grange.

may then be ueed as a guide in farm planning.

The criteria for adequate income for this study was baeed on another etudy which tried to answer this question "How much land and other resources do farmers need to combine with their labor and management in order to obtain levele of earnings similar to thoee of semiskilled and skilled workers in nonfarm employment?"[1] Mr. Brewster suggested "For each of these situations, the amount and kinds of resources required to enable operatore to have earnings (labor and management) of $2,500 and $3,500 were estimated. One or the other of these figures approximated the 1954 median earnings of semiskilled industrial workers in each of the statee under consideration."[2] Adjusting for increase in price level comparable incomee for $2,500 and $3,500 for 1959 would be $2,745 and $3,843 respeotively.[3] The figure of $3,843 ie used in this study for what might be considered an adequate inoome for Kaneae.

DESCRIPTION OF THE AREA

The land in eoutheast Kansas was not homogeneous from the etandpoint of soil types, nor was it found to be particularly

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1. John M. Brewster, Farm Resources Need for Specified Income Levels, Agriculture Information Bulletin No. 180, U.S. Department of Agriculture, Agriculture Reeearch Service, p. 1.
2. Ibid., p. 1.
3. Consumer Price - all items: 1947-49 = 100; 1954 = 114.8; 1959 = 124.6. Council of Economic Advisere, Economic Indicators, May 1960, prepared for the Joint Economic Committee, U.S. Government Printing Office, Washington 1960.

fertile unless proper management and fertilization practices were employed. The minimum depth to bedrock was from ½ to 4 feet, which indicates relatively shallow soils requiring good management to be productive.[1] Most soils had moderate to slow permeability through a heavy claypan subsoil.

The topography varied considerably, ranging from undulating and rolling slopes susceptible to erosion and excessive draining in the upland area to nearly level and even poor drainage in the alluvial soils of the flood plains and terraces. Recommended soil conservation practices were required on the majority of the land area to control erosion.

Almost without exception, cropland in southeast Kansas needed regular applications of lime to neutralize high soil acidity. Ellis predicted the amount of lime required to neutralize acid soils in a particular area to be very closely related to the annual rainfall.[2] Southeast Kansas was located in a moderately heavy rainfall area (38" to 40" annually) and was included in a belt of relatively acid soil.

The low level of soil fertility suggested extensive use of commercial fertilizers. Most crops required additional nitrogen, and in limited cases, potassium to furnish adequate soil nutrients for the higher yields. Soil was characteristically deficient in phosphorous which should have been almost universally

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1. O. W. Bidwell, Major Soils of Kansas, Kansas Agricultural Experiment Station, Circular 336, pp. 14, 15.
2. Roscoe Ellis, Jr., Liming Soils in Kansas, Kansas Agricultural Experiment Station, Circular 313, p. 3.

applied. "The phosphorous need is greatest in the southeastern part of Kansas on soils subjected to heavy rainfall and on soils in other parts of the eastern half of the state, especially where erosion has removed much of the surface soil."[1] Mixed fertilizers provide sufficient amounts of deficient elements. Soil conditions normally responded well to good soil management and fertilizer. Legumes were recommended to maintain a satisfactory level of organic matter in the soil.

Climate

The climate in southeast Kansas was found to be relatively mild and suitable for general farming. Figure 2 shows the annual precipitation which varied from 34 inches in the northeastern section to 42 inches in the southeast. Figure 3 shows annual average precipitation by months in Anderson County. This 16 year period showed increasing precipitation in early spring to June and then a sharp decrease in the midsummer months of July and August. Again in September, rainfall increased and then steadily declined through the fall and winter. The implication herein serves as a warning to summer crop production. Annual drought could be expected so regular soil moisture conserving management practices should be employed.

Figure 4 given the annual mean temperature ranging from 56 degrees in the northern counties to 58 degrees in the southern

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1. O. W. Bidwell, op. cit., p. 15.

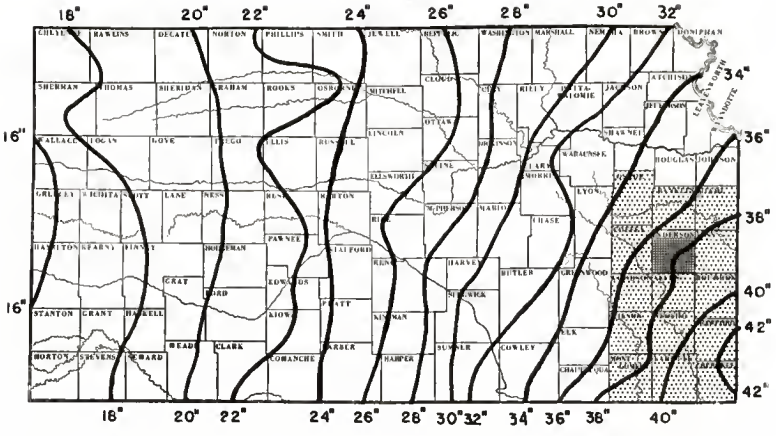

Fig. 2. Average annual Kansas precipitation. (Based on 1898-1942 period.) Source: O. W. Bidwell, Major Soils of Kansas, Kansas Agricultural Experiment Station Circular 336, p. 4.

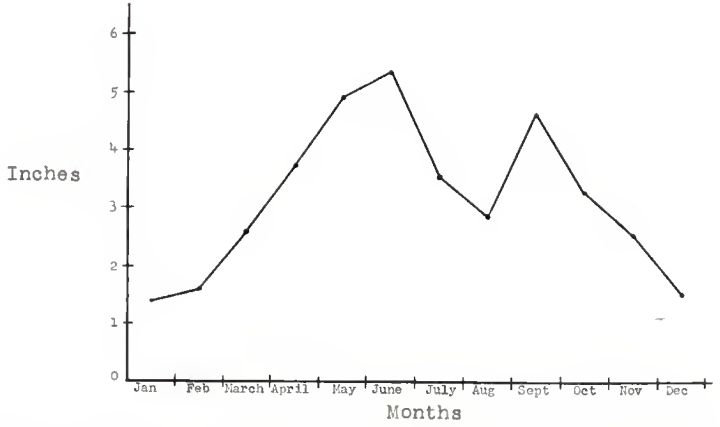

Fig. 3. Normal precipitation by months, Garnet, Anderson County, Kansas. (Based on 1931-1946 period.) Source: Climate of Kansas, Report of the Kansas State Board of Agriculture, 1948.

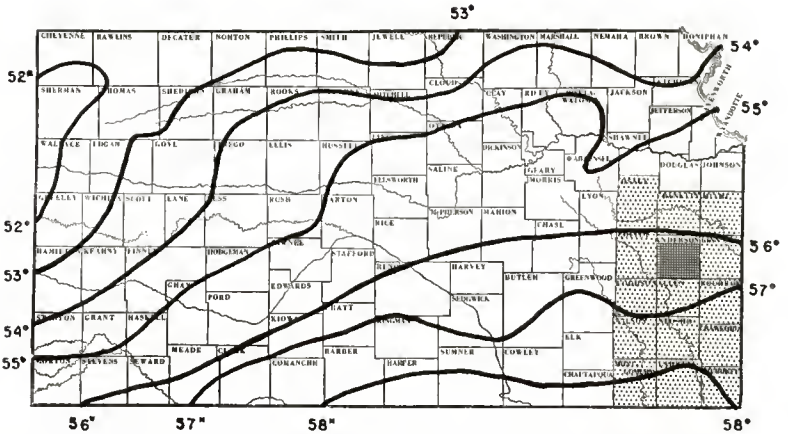

Fig. 4. Annual mean temperatures. (Based on 1898-1942 period.) Source: O. W. Bidwell, Major Soils of Kansas, Kansas Agricultural Experiment Station Circular 336, p. 5.

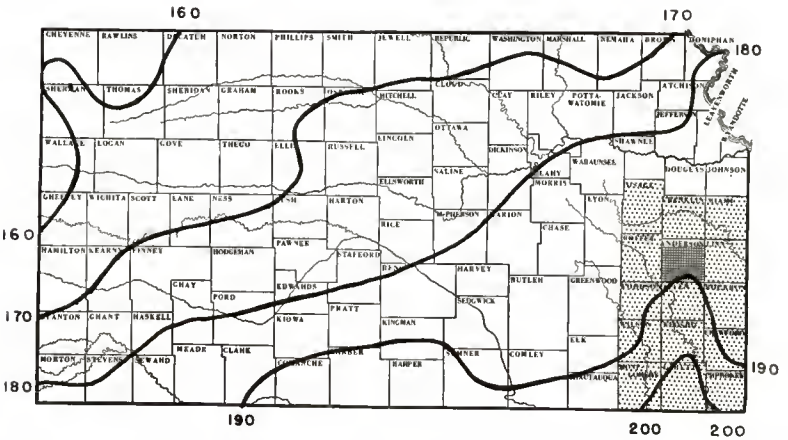

Fig. 5. Average length of growing season. (Consecutive days with minimum temperature above 32° F.) Source: O.W. Bidwell, Major Soils of Kansas, Kansas Agricultural Experiment Station Circular 336, p. 5.

counties of Type-of-Farming Areas 1 and 2. The length of growing season or average number of consecutive days with minimum temperature above 32 degrees was 190 to 200 as illustrated in Figure 5.

Land Distribution

Land in Type-of-Farming Areas 1 and 2 was divided into 3 classifications: total cropland, pasture other than cropland, and total nonproductive land.[1] Table 1 shows the actual acreages and the calculated percentage of land in each class. The computation of total acreas for each classification was based on totals for the 15 counties in Type-of-Farming Areas 1 and 2 which were calculated from data in the 1954 Census. Total cropland was taken directly from the totals and occupies 52 percent of the total land area.

Pasture other than cropland was computed by subtracting cropland used for pasture from total land pasture. The resulting 41 percent of the total land was thought to be an accurate indication of the amount of pasture available. Pasture land classified in this manner must not be assumed to be entirely composed of good native pasture since woodland and other poor quality pasture were included.

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1. Nonproductive land included all land not belonging in pasture or cropland such as woodland not pastured, roads, waste, farmstead, wasteland and levee.

The remaining land was classified as nonproductive land calculated by adding all waste, etc., and woodland not pastured. This category comprizes 7 percent of the total land area and was assumed to return no cash return to the farm. Homes, farmsteads and feedlots were placed in this class.

Land Use

Type-of-Farming Areas 1 and 2 were best adapted to general farming with numerous beef, dairy, and hog enterprizes.[1] Under good management, small grains, legumes and pasture crops were found best suited to the prevailing soil and climatic conditions. Available data indicated wheat, corn, oats, soybeans, alfalfa, sorghum for grain, and sorghum for silage were the important crops and occupied 76 percent of the cropland.[2]

THE BUDGET

Budget analysis was employed in the study, just as it has been effectively used for many years in farm management

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1. See Fig. 1, p. 2.
2. Kansas State Board of Agriculture, Price Patterns, 1954-55; 1955-56; 1956-57; 1957-58. Specified crops in 15 counties in Type-of-Farming Areas 1 and 2 were calculated to occupy the following percentages of cropland: corn 17.2 percent, wheat 21.9 percent, oats 11.1 percent, soybeans 10.7 percent, alfalfa 6.6 percent, sorghum for grain 8.2 percent, sorghum for forage .3 percent, other crops 24 percent, total 100 percent.

research.[1] Heady and Jensen have set forth the function of a farm budget.

> The answer is the budget or farm plan, a formal or informal device for setting down the different crops or livestock which can be produced and in deciding which alternative is most profitable. It is also used to decide the best production methods--whether to use horse or tractor power, or large or small machines. The farm plan or budget is to the farmer what the blueprint or architect specifications are to the building contractor. It shows what is to become and how to do it. In setting up a budget or plan, we set down the prospective acreas of each crop and the numbers of each livestock; we evaluate farming practices and estimate the yields and production; income and costs are computed and finally net income is made. If we make up budgets for several systems of farming, we predict which one will be most profitable. Every good businessman makes up a plan of this sort; he budgets his use of capital and labor.[2]

Thus, budgeting is a technique for assembling and organizing information in order to facilitate decisions with respect to the management of farm resources. This study made full use of the budget analysis fully utilizing economic principles with regards to the selection of production techniques and the resultant organization analysis. Since a budget is no better than the data in it, considerable detail was given to how standards were developed for this study.

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1. A few examples in which the budget technique has been successfully used here at Kansas State University are: (a) R. J. Doll, Planning the Farm Business in the Bluestem Belt of Kansas, Kansas Agricultural Experiment Station Bulletin 294; (b) R. J. Doll, Planning the Farm Business in South Central Kansas, Kansas Agricultural Experiment Station Bulletin 312; (c) R. J. Doll and Emery Castle, Suggested Adjustments for Southwestern Kansas, Kansas Agricultural Experiment Station Circular 267; (d) J.W. Koudele and N. R. Sheets, Estimated Capital Requirements, Costs, and Returns of the Egg Enterprise in Kansas, Kansas Agricultural Experiment Station Technical Bulletin 103.

2. Earl O. Heady and Harold R. Jensen, Farm Management Economics, p. 91.

General Procedure

Aeseesor's rolls, ceneue data, Kaneas State Board of Agriculture biennial reports, experiment etetion data, farm management rscords and other eources of information were ueed in developing these various farm organizations. The advice of various agricultural specialists was also used.

A farm organization for a general farm wae first dsveloped for the 320 acre and 480 acre farm. Then a primarily oash-grain farm and a primarily livestock farm were developed for the 320 and 480 acre farme. There were then three different farm organizations for each size of farm. Thus a oomparisen could be made of the financial returns for each farm organization.

General Assumptione

One important baeic aesumption characterizing this etudy wae above average managerial oapability of the farm operator. It wes the firm belief of authorities that thie specifio assumption played a more etrategic role in farm operation than any other factor of produotion (i.e., land, labor, or capital).

> In each inetance, a Maeter Farmer has operated under the same laws, in the same climate, with ths same markets, transportation facilities, informational aids, eto., ae have his neighbors. In most inetancee, hs started, economically. "From ecratch," ae probably wae true of most of his neighbore. But this particular farmer and his family have poeeeesed and exercieed pereietently certain human qualitiee either not poeeeseed to the same degres or not

exercieed to the eame extent by his neighbors.[1] This aseumption granted the hypothetical budgeted operations contained herein, a distinct advantage over current "average operatione" in southeast Kansee. Therefore, the willingnees of the operator to carefully observe, analyze, and make the decisions most beneficial to his farm operation were assumed throughout this thesis.

A second aseumption limits the size of enterprise to that which required very limited hired labor in addition to that furniehed by the operator and his family and limited off farm reeources. Labor wae assumed to be hired only during extremely rushed periode such as the harvest of various crops. Hired labor was needed for efficient operation of specific taeks euch as baling, combining, oornpicking, and forage harvesting.

Each farming system was assumed to be on an uninoorporated owner-operator basis. Additional technical aseumptions are described in eucceeding sections relevant to their specifio coneideration. With few noted exceptions, all prices and production etandards were based on average future expectations over a three to five year time period immediately subsequent to the date of writing.

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1. F. D. Farrell, Kansas Rural Institutions: VII. Kansas Master Farmers, Kansas Agrioultural Experiment Station Circular 274, p. 38.

Crop Budget Requirements

A regular crop sequence based on a four year stand of alfalfa was considered sufficient to maintain the soil condition, providing alfalfa was established on each acre of cropland at some time during the sequence. This practice was necessary to maintain a satisfactory structural condition in the characteristically tight, clay pan soils. Within the crop sequence, it was the opinion of agronomists at Kansas State University that wheat could follow milo, sorghum for silage, or soybeans the same year.

Yields. Crop yields were estimated for corn, wheat, milo, soybeans, sorghum for silage, and alfalfa hay. The yields used for budget purposes were based on conditions of good management and consequently were somewhat higher than average for the area. Table 2 shows yields used for all budgets in this study.

Yields were based on common recommended varieties for southeast Kansas such as Pawnee wheat, recommended commercial varieties of hybrid corn, Hong Kong soybeans, Kansas common alfalfa, Atlas sorgo for silage, and recommended commercial varieties of hybrid milo. Recent performance tests indicated considersble yield advantage of hybrid milo over varieties such as Midland and Plainsman.[1] Hybrid sorghums for silage held a less distinct advantage. There was some question whether hybrid sorghums were

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1. A. L. Clapp, Kansas Grain Sorghum Performance Tests 1958, Agricultural Experiment Station Bulletin 403.

Table 2. Crop yields for Anderson County, Kansas.

Crop	Yield per acre[1]
Corn	34 bushels
Wheat	28 bushels
Soybeans	15 bushels
Milo	32 bushels
Sorghum (silage)	9 tons
Alfalfa[2]	2.5 tons

1. Final determination of crop yields was made by Professor E. A. Cleavinger, Extension Specialist in Agronomy, KSU, Manhattan, Kansas, which were based on good management practices. However, the following references were used in computing these yields: Farm Facts, 1955-59, Kansas State Board of Agriculture; Farm Management Summary and Analysis Report for Association #6, 1955-58, Kansas Agricultural Experiment Station; Dale A. Knight, Resource Use and Productivity and Farm Income, Anderson County, Kansas, 1950, Kansas Agricultural Experiment Station, Agricultural Economics Report 88; and average yields at the Columbus Experiment Station, 1926-59, obtained from the Department of Agronomy, Kansas State University, Manhattan, Kansas.

2. Assume alfalfa was harvested for 4 years, then plowed under.

sufficiently improved over Atlas sorgo to merit extensive consideration. Experiment station results in 1957 and 1958 indicated yields of hybrids were not greater than those of the higher yielding varieties.[1] However, the experiment station were con-

1. A. L. Clapp, 1959 Experiment Station Results with Sudangrass, Millet, Forage Sorghum, and Soybean Varieties, Kansas Agricultural Experiment Station Report of Progress (mimeo) 38, p. 11.

stantly dsvsloping and testing now hybrids, and it appeared likely that in the near future, hybrids might surpass the common varietiss.

Planting Ratss. Sesd plsnting ratss were estimated by consldering rscommendations of the Agroncmy Dspartment, Kansas State University.[1] Refsrsnces to actual planting rates used in Andsrson County providsd a basis for sslecting rsalistic planting rates for varioue crops as shown in Table 3.

Table 3. Annual sssd rsquiremsnt and cost psr specified crop acrs.

Crop	Lbs. applisd psr acre	Purchasing unit	Amount psr acre/[1]	Cost per purchasing unit	Annual cost per acrs
				$	$
Corn	7	bu.	.125	11.00	1.38
Whsat	84	bu.	1.40	1.75	2.45
Soybeans	36	bu.	.60	3.00	1.80
Milo	5	cwt.	.05	16.00	.80
Sorghum (silage)	9	cwt.	.09	6.50	.59
Alfalfa[2]	15	cwt.	.15	33.00	(4.95) 1.24

1. Planting rates wers estimated within rangss rscommended with Crop Varisty and Planting Rscommendatione for Kaneas, Kansas Agricultural Expsriment Station Rsport 6. Actual planting rates in Anderson County as detsrminsd by Dals A. Knight, Practicss and Rsquiremsnts for ths Production of Farm Crops, Andsrson County, Kansas, 1950, Kansas Agricultural Expsrimsnt Station Agricultural Economics Report 65, to calculats the exact rats within the rscommsnded range.

2. A nsw stand of alfalfa was sstablishsd evsry 4 ysars, so an annual cost of $1.24 psr acre for sssd was calculated to be ¼ of ths cost of $4.95 for establishing a nsw stand.

1. Crop Varisty and Planting Recommsndations for Kansas, Kansas Agricultural Expsriment Station Rsport 6.

Fertilizer and Lime. Fertilizer requirements were derived from recommendations by the Kansas Agricultural Experiment Station and actual applications in Anderson County.[1] The amounts used for budget purposes were judged sufficient to supply the various crops with adequate quantities of nitrogen and phosphorus. Individual farms should have soil tests to find the precise amount of fertilizer required for particular fields. When only mixed fertilizer was applied to crops, there was some question concerning the amount of nitrogen supplied. It was thought additional nitrogen and organic matter supplied by farm manure would provide sufficient amounts of these nutrients benefits, when otherwise the quantity was minimum.

All fertilizers were applied at the time of seeding by means of a fertilizer attachment on the drill or planter. Some authorities recommended alternative practices of side dressing corn and sorghums at the first or second cultivation and top dressing wheat with ammonium nitrate any time until March 15, rather than applied with phosphorus at planting time. This practice was followed for corn and wheat, but not for sorghums. Sorghum requirements for nitrogen were somewhat less than for wheat or corn, so it was assumed additional side dressing was not necessary. Fertilizer rate of application, cost, and cost per acre for specified crops is shown in Table 4.

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1. F. W. Smith, Fertilizer Recommendations for Kansas, Kansas Agricultural Experiment Station Circular 285; Dale A. Knight, Practices and Requirements for the Production of Farm Crops, Anderson County, Kansas, 1950, Kansas Agricultural Experiment Station, Agricultural Economics Report 65.

Table 4. Annual fertilizer requirements and coste per acre for selected crops, Andereon County, Kansas.[1]

Crop	Superphosphate (0-45-0)			Mixed (16-20-0)			Ammonium nitrate (33.5% N)			Lime[2]			Ann. cost per acre
	Cost ($/cwt)	Amount (cwt)	Total coet ($)	Cost ($/cwt)	Amount (cwt)	Total coet ($)	Cost ($/cwt)	Amount (cwt)	Total cost ($)	Cost ($/cwt)	Amount (ton)	Total cost ($)	$
Corn				4.50	1.5	6.75	4.25	.75	3.19				9.94
Wheat				4.50	1.5	6.75	4.25	.5	2.13				8.88
Soybeans													
Milo				4.50	1.5	6.75							6.75
Sorghum (eilage)				4.50	1.5	6.75							6.75
Alfalfa[3]	4.00	3.6	14.40										3.60
All cropland										3.38	.2	.68	.68

1. Ratee of application baeed on information from F. W. Smith, Fertilizer Recommendatione for Kansas, Kaneae Agricultural Experiment Station Bulletin 285.

2. Lime was applied at a rate of 2.0 tons per acre every 10 yeare. Conesequently, an average annual application wae calculated to be .20 tone per crop acre.

3. Fertilizer was baeed on application of 360 pounde euperphosphate per acre before new stand was established every 4 yeare. Coet per acre was therefore $\frac{1}{4}$ of the coet of fertilizer when establishing a stand of alfalfa.

Fertilizer was not applied to soybeans. "No general recommendation is made for direct fertilization of soybeans."[1] Fertilizer response to soybeans has been erratic in experiment station tests and the increase in yield has not been large. Although soybeans were not fertilized in this study, a suggested application rate for phosphorus was 90 pounds superphosphate (0-45-0) per acre, in extremely phosphorus deficient areas.[2] All other crops responded well to good fertilizer management.

The need for lime in southeastern Kansas cannot be over emphasized. It was desirable to apply lime prior to establishing strong legumes. Alfalfa in particular, removed large amounts of lime, which in extreme cases, actually resulted in calcium starved plants. Furthermore, the highly acid soil limited the availability of phosphorus and other plant nutrients.[3] The effect of lime on various crop yields compared to yields of untreated plots was studied at the Columbus experiment field and especially pointed out the benefits of liming before legumes. Table 5 shows a 209 percent increase in alfalfa yield which illustrated the importance of liming alfalfa. Increased yields in other crops were probably due, in part, to the increased effectiveness of alfalfa in the crop sequence.

Lime was applied at a rate of 2.0 tons per acre every 10 years by a commercial lime spreader. It was assumed that lime

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1. F. W. Smith, op. cit., p. 14.
2. F. W. Smith, op. cit., p. 14.
3. Roscoe Ellis, Jr., op. cit., p. 3.

was applied prior to establishing a stand of alfalfa. However, if lime was applied only before alfalfa was established, the farm organizations with minimum alfalfa acreage would not receive a sufficient amount of lime to neutralize the acid soil. Therefore, lime was assumed to be applied at other times during the crop sequence to keep soil acidity at a recommended level.

Table 5. Effect of lime in a rotation of crops, Columbus Experiment Field, 1924-1954.

Crop	Number of	Average yield[1] per acre		Increase due to liming	% Increase in yield due to liming
		Unlimed	Limed		
Alfalfa	29	.53 ton	1.64 ton	1.11 ton	209.4
Corn	24	19.80 bu.	29.90 bu.	10.10 bu.	51.0
Flax	23	7.80 bu.	10.70 bu.	2.90 bu.	37.2
Oats	24	19.70 bu.	30.50 bu.	10.80 bu.	54.8
Wheat	24	16.30 bu.	21.60 bu.	5.30 bu.	32.5
Soybeans	24	10.10 bu.	11.70 bu.	1.60 bu.	15.9

1. Calculated from: F. W. Smith, F. E. Davidson and V. H. Peterson, Soil Fertility Investigations at Columbus Experiment Field, 1924 - 54.

It was realized A.S.C. payments would lower liming expenses, however, this was not considered in budgeting because to qualify for payments, lime must be applied immediately prior to establishing legume or grasses. Since legumes occupied only a small percent of the total cropland and were established every 4 years, the compensation would not have been of great significance as based on the average application of 2 tons per crop acre every 10 years. Lime applied at this rate was budgeted at .2 tons per acre annually at cost of $3.38 per ton. An annual lime cost

of $.68 per crop acre was derived and used in all budgets.

Pasture Stocking Rate. As mentioned previously, pasture in southeast Kansas varied considerably, ranging from excellent native Bluestem to areas of poor pasture that had been grossly overgrazed. While good Bluestem pasture may safely carry 1.3 - 1.4 A.U.M.'s per acre, ranges in extremely poor conditions were in such dire need of improvement that stocking would not be advisable.[1] These wide variations presented a complex problem of selecting an average stocking rate for the area. An average stocking rate of .5 to .7 A.U.M.'s per acre was considered reasonable for use in budgeting.[2]

Labor and Power Requirements. Estimated typical operations, typical dates, machinery required, labor and power hours and fuel used for specified crops are shown in the Appendix.[3] The labor and power requirements represent time actually spent in the field and reflect the influence of bad weather. Allowance was made for all normal operational duties such as adjustment, repair, greasing, etc., but does not account for time lost due to breakdowns and actual time for travel to and from the field. Consequently, these basic power and labor requirements were slightly low and needed to be adjusted upward to obtain realistic standards. Therefore, it was assumed that a man would need to spend 20 percent

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1. An A.U.M. (Animal Unit Month) is one month's grazing for an A.U. (animal unit) which is equal to a 1,000 pound beef animal.
2. This estimate was obtained from Kling L. Anderson, Professor Agronomy and range specialist, Kansas State University.
3. See Tables 56-62, pp. 121-128 in Appendix.

more time than the houre shown in the Appendix and that traotor hours and fuel requiremonts would be inoreased by 10 peroent.[1] These adjustments were considered adequate and compared favorable with Farm Management "Man Work Day Standards".[2] Table 6 shows adjusted labor, power, and fuel requirements used in budgeting to allow for breakdowne and travel to and from the office

Livestook Budget Requiremente

The beef cattle production bueineee is extremely complex in nature with many alternative cattle feeding systems poesible. For eaoh type of syetem, the objective of growing, growing and fattening, fattening, or any combination of these purpoees, there were many variations with respect to methode of handling, age and weight, original condition, grade, desired finish, eto., to further expand the possibilitiee of producing beef cattle.

For purposes of this study, the livestook systems have been restricted to deferred full fed eteere, and wintering and fattening heifers.[3] These programs have been eucceesful in Kansas in

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1. O. J. Scoville, J. A. Hodgee, Practicee and Costs on Wheat Farms in Western Kansas, 1947, Agricultural Experiment Station Circular 268, p. 20.

2. Kansas Farm Management Assooiation Acoount Book, Kansas State University, Extension Division and the Department of Agricultural Eoonomics, Form 2.

3. The progrsm of wintering and fattening heifers wae a modification of the etandard deferred systems. Heifer calves are bought in the fall, wintered well and put on full feed in May for market in late summer. This syetem ie adaptable to farms with limited pasture since the grazing phase ie omitted.

Table 6. Total labor, power, and fuel requirements for specified crops, Anderson County, Kansas

Crop	Average per acre[1]		
	Power[2]	Labor	Fuel
	Hrs.	Hrs.	gal.
Wheat:			
With combine	4.37	4.87	6.70
Without combine	3.62	3.96	5.40
Corn:			
With picker	7.28	8.09	9.60
Without picker	5.89	6.49	7.74
Soybeans:			
With combine	5.93	6.61	8.34
Without combine	4.90	5.48	6.78
Milo:			
With combine	5.73	6.40	7.79
Without combine	4.73	5.27	6.63
Sorghum for silage:			
With forage cutter	10.40	16.03	14.63
Without forage cutter	8.82	14.32	11.50
Alfalfa:			
Establish	4.83	5.28	8.20
Harvest, with baler	5.19	10.19	8.81
Harvest, without baler	3.83	7.24	4.85
Annual requirement, with baler[3]	6.40	11.49	10.86
Annual requirement, without baler[3]	5.04	8.54	6.90

1. Total requirements were calculated from data in Tables 56 through 62 in the Appendix which were adjusted upward by 20 percent for man hours and 10 percent for tractor and truck hours and gallons of fuel to account for breakdowns moving to and from field, servicing machines, etc.
2. Power hours are the sum of tractor and truck hours.
3. Annual requirements for alfalfa include requirements for establishing a new stand every 4 years.

the past, and were expected to continue. Such programs offered a large degree of flexibility, permitted utilization of farm produced grain and roughage, and profitable disposition of pasture crops. Also, the size of livestock enterprize was easily adjusted to meet varying requirements for feed, labor, capital, etc., as the individual farm deviated from the representative.

The Deferred Steer System. The deferred full feeding program was recognized as one of the more efficient systems of beef production. "It utilizes grass and roughages most efficiently in producing well finished young cattle, and has ranked near the top of the systems of beef production in Kansas."[1] The deferred steer program was adopted to the budgets with requirements as shown in Table 7. The regular phases of the system, wintering, grazing, and full feeding, were supplemented with a pre-wintering phase to make use of late fall pasture and available crop aftermath. This phase began with the purchase of good quality calves in normal condition for range calves purchased at 425 pounds about October 15th at $22/cwt. or $93.50/head. These calves were pastured on the available pasture and aftermath, with some additional grain and protein supplement near the end of the best grazing period. The calves were fed primarily to overcome their initial shrink and adjust to new surrounding and to gain an average of ½ pound per day.

Near the 1st of December, the calves were started on their wintering ration. This phase wintered them well to gain 1½ pounds per day on a limited amount of grain and good quality alfalfa hay, silage and protein supplement. Under these conditions, the cattle gained 225 pounds and were fleshy as they went to pasture May 1st.

The stocking rate for deferred steers was calculated to be

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1. V. E. McAdams, Deferred Full Feeding of Beef Cattle, Kansas State College Extension Circular, 238, p. 2.

Table 7. Deferred steer program, characteristics, requirements, and production, Anderson County, Kansas.[1]

Item	Unit	Phases				Total
		Pre-wintering	Wintering	Grazing	Full feeding	
Begin phase	Calendar date	Oct. 15	Dec. 1	May 1	Aug. 1	
End phase	Calendar date	Dec. 1	May 1	Aug. 1	Dec. 15	
Days in phase	Days	45	150	100	120	415
Gain[2]	Lbs.	25	225	100	300	650
Corn equivalent	bu.	2	10	0	31	43
Hay[3]	Ton	0	.3	0	.2	.5
Silage[3]	Ton	0	1.4	0	.6	2.0
Protein supplement	Lbs.	25	150	0	225	400
Salt and mineral	Lbs.					20
Grass	Acres	/4	0	3.5	0	3.5
Labor[5]	Hr/head	.95	3.15	.95	3.45	8.5
Power[5]	Hr/head	.50	2.00	.30	2.20	5.0

1.. This program was recommended by Kansas State University and approved by Professor Lot Taylor, Extension Specialist in Animal Husbandry.

2. Beginning weight of steers 425 lbs. and final weight 1,075 lbs.

3. Hay and silage were substituted for each other at a ratio of 3 tons silage to 1 ton hay.

4. Grass for pre-wintering phase included crop aftermath. If grass was available for grazing, pasture would not have been damaged by moderate fall grazing and was not considered in calculating the pasture stocking rate. However, as the grass and aftermath were utilized, grain and protein supplement were necessary to maintain the rate of gain.

5. Labor and power requirements were calculated from Dale A. Knight and C. F. Bortfeld, Labor and Power Requirements by Size of Beef Cattle Systems in Eastern Kansas, Kansas Agricultural Experiment Station Technical Bulletin 98.

3.5 acres per head during the three month grazing period. Deferred steers were estimated to average 700 pounds or .7 A.U. during the three month grazing season. On the basis of 2.10 A.U.M.'s required per steer and .6 A.U.M.'s available per acre for pasture, a stocking rate of 3.5 acres pasture per steer was calculated.[1] This stocking rate was thought to furnish sufficient summer grass for deferred steers and promote the general improvement of range conditions. It must be noted that this was an average stocking rate for southeast Kansas, and each pasture must be evaluated to determine its specific stocking rate.

The steers were expected to gain 1 pound per day on grass. Although it was not specified in the system summary, it would have been desirable to feed the steers limited protein and grain on grass near the end of their grazing phase when the pasture began to dry up. This would hold the grass gain and put the cattle in good condition to begin the full feeding phase August 1st.

The full feeding phase continued in the dry lot with a fattening ration of corn, hay, silage, and protein supplement in adequate amounts to produce 2.5 pounds daily gain. Over the 120 day full feeding period, the steers reached a grade of low choice to choice and were ready to sell at 1,075 pounds about December 15th.

A two percent death loss was subtracted from the 1,075 pound final fed weight. Furthermore, the actual weight at the market

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1. For explanation of A.U.M. and pasture stocking rate, refer to section "Pasture Stocking Rate", p. 26.

was assumed to be 96 percent of the final weight minus death loss.[1] This allowed an actual market weight of 1011.4 pounds sold at $23 per cwt. to gross $232.61 per head. With an initial cost of $93.50 per head, net receipts for deferred steers were $139.11 per head.

This late marketing date was recommended to take advantage of a recent historical price advantage which is partially due to increased carcass grades. Later markets have been somewhat less reliable than the earlier, but over a period of years, have proven advantageous.

> This trend, toward higher average returns from December and January marketing of deferred fed steers, should be noted as evidence of a shifting in the steer marketing structure. Evidently, more fat cattle are now being marketed during the early fall months from deferred feeding operations and commercial feed lots. Therefore, Kansas stockmen who wish to take more complete advantage of the grazing season to secure lower cost grains on their cattle, have a better opportunity to do so and still market the steers to good advantage, than was true in earlier years. The exception which still holds true is that in years of declining prices, selling in November is more desirable.[2]

Conceivably, if the operator was so lacking in available capital, he was unwilling to assume additional risk, then an earlier marketing date might have been preferred, even if less profitable in the long run.

The Wintering and Fattening Heifer System. A system of wintering and fattening heifers was adapted to the budgets to

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1. Purdue University, Agriculture Extension Service, Manual of Beef Cattle Management, November 1958, Table 9, p. 22.
2. Wilton B. Thomas, Profit Factors in Marketing and Management of Kansas Deferred Fed Steers and Heifers, Unpublished Master's Thesis, Kansas State University, 1960, p. 30 - 31.

allow additional livestock for efficient utilization of remaining farm produced roughages and grain when pasture was fully stocked. This system is shown in Table 8, and was similar to the deferred full feeding system except the grazing phase was omitted. Heifers were bought at 400 pounds at $20 per cwt. or $80.00 per head and handled in the same manner through the pre-wintering and wintering phases, but were placed in dry lot May 1st rather than pastured.

The heifers were full fed 3 months until they were sold around August 1st. During this time they were expected to gain 2½ pounds a day on the fattening ration. A selling weight of 875 pounds was expected to bring desirable prices in the mid-summer fat heifer market. A two percent death loss factor was also deducted from the 875 pound final fed weight of heifers. Actual market weight was assumed to be 97 percent of the final fed weight minus death loss.[1] The resulting actual weight at market was 831.78 pounds sold at $22 per cwt. to gross $182.99 per head. Gross receipts minus $80.00 purchase cost resulted in $102.99 net receipts per heifer.

Livestock Labor and Power Requirements. Total labor and power requirments for handling steer and heifer programs consisted of labor and power used in feeding silage, alfalfa, grain, protein and other tasks such as watering, checking herd, mixing and grinding feed, handling manure, vaccinating, spraying, hauling feed, working cattle, and veterinary labor. Since no beef-

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1. Purdue University, Agriculture Extension Service, op. cit., Table 13, p. 27.

Table 8. Wintering and fattening heifer program, characteristics, requirements, and production, Anderson County, Kansas.[1]

Item	Unit	Phases			Total
		Pre-wintering	Wintering	Full feeding	
Begin phase	Calendar date	Oct. 15	Dec. 1	May 1	
End phase	Calendar date	Dec. 1	May 1	Aug. 1	
Days in phase	Days	45	150	90	285
Gain[2]	Lbs.	25	225	225	475
Corn equivalent	bu.	1	8	21	30
Hay[3]	Ton	0	.3	.2	.5
Silage[3]	Ton	0	1.2	.3	1.5
Protein supplement	Lbs.	25	150	175	350
Salt and mineral	Lbs.				12
Grass	Acres	/4	0	0	/4
Labor[5]	Hr./head	.95	3.15	2.6	6.7
Power[5]	Hr./head	.50	2.00	2.0	4.5

1. This program was recommended by Kansas State University and approved by Professor Lot Taylor, Extension Specialist in Animal Husbandry.

2. Beginning weight of heifers 400 lbs, final weight 875 lbs.

3. Hay and silage were substituted for each other at a ratio of 3 tons silage to 1 ton hay.

4. Grass for pre-wintering phase included crop aftermath. If grass was available for grazing, pasture would not have been damaged by moderate fall grazing and was not considered in calculating the pasture stocking rate. However, as the grass and aftermath were utilized, grain and protein supplement were necessary to maintain the rate of gain.

5. Labor and power requirements were calculated from Dale A. Knight and C. F. Bortfeld, Labor and Power Requirements by Size of Beef Cattle System in Eastern Kansas, Kansas Agricultural Experiment Station Technical Bulletin 98.

feeding eyetem contained extremely emall or large numbere of cattle, the economiee of aoale were assumed to be negligible and all requirements were held constant for all sized enterpriees. Irregularities in available data neceaaitated thee budget aeeumptione, even though it would have been more realietic to show eome economy of labor and power ae size increasee.

Caeh Liveetock Expenaee. Liveetock expensee included veterinary eervice and medicine coste, feed bought, machinery power coet, and marketing coete. Veterinary eervice and medicine expensee were aeeumed to be $2.00 per head for both steere and heifere.

Feed coste were a total of all feed and eupplement purohaeed in addition to that produced on the farm. Milo was aseumed to eubstitute ae feed grain at 95 percent feeding value relative to oorn and wae purchased if additional grain was required.[1] At 95 percent feeding value of corn, milo wae the leaet ooet grain at $.85 per buehel and corn $.95 per buehel. Milo furniehed 100 pounds of corn equivalent for $1.60 while the higher priced oorn furnished 100 pounds oorn equivalent for $1.70. All milo purchaeed wae charged $.05 per buehel for trucking whioh was included under "Feed Grain Hauled" in the budgets. If grain in excese of that fed to liveetock was produced on the farm, all milo wae fed and the eurplue corn eold.

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1. Leonard W. Schruben, Ruth E. Clifton, How to Save When Buying Grains, Kaneae Agricultural Experiment Station Circular 299.

A relationship of .67 gallons of fuel consumed to .55 hours of power used in livestock production cited in Knight's study was adjusted to 1.22 gallons of fuel for one hour of power to calculate livestock machinery power cost.[1] The cost per hour of power for livestock was calculated similarly to machinery operating costs for crop production.[2] The computed cost of power was approximately 27.5¢ per hour for 5 hours total power requirements to give $1.38 per deferred steer and 4.5 hour total power requirements resulting in $1.24 per heifer.

Marketing costs were calculated at $.50/cwt. liveweight at market.[3] A per head marketing cost of $5.06 and $4.16 for steers and heifers respectively was calculated from their final market weights of 1011 and 832 pounds.

Livestock Investment and Fixed Expenses. The average investment for livestock enterprises was divided into three categories -- livestock, livestock equipment and buildings, and feed. The average investment during one year for these items was charged interest which was considered an "opportunity cost". When used in this manner, the opportunity cost indicates the income sacrificed if the operators capital involved in average investment for livestock enterprises were invested elsewhere at the same interest. On the otherhand, if the operator was required to

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1. Dale A. Knight, Beef Cattle Production in Anderson and Labette Counties, Kansas, 1950, Kansas Agricultural Experiment Station, Agricultural Economics Report 76, p. 17.

2. Fuel at $.20 per gallon, oil and lubricant at 12.4 percent of fuel cost. See "Farm Machinery and Equipment" section for detailed explanation.

3. Purdue University, Agriculture Extension Service, op. cit.

borrow this amount of capital from a lending institution, this cost would approximate his interest expense.

The average investment in steers and heifers was an average of purchase cost and sales receipts times the part of a year the cattle were owned. The average value of steers was $163.00 per head. Since they were kept on the farm 14 months, their average investment was 1.15 times the average value or $187.00. The average value of heifers was $131.50, but they were kept only nine months or .75 years, so the average investment was $99 per head.

An average livestock investment of $5 per head for both steers and heifers was assumed adequate for all equipment and buildings necessary for livestock production not included as real estate.[1] This livestock building and equipment investment was included with the other buildings and improvements on the farm in "Buildings and livestock equipment" as fixed capital.

Average feed investments were based on $76.90 per steer and $59.60 per heifer and were derived by totaling the cost of all feed required, (not including pasture) for one animal. It was assumed the average feed investment would be one-half the total feed cost, since normally feed would be stored on the farm about one-half year.[2]

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1. H. C. Love, J. H. Coolidge, R. D. McKinney, op. cit., p. 7.
2. Most roughage would be consumed in the winter after it was harvested; some grain would be fed to steers immediately after it was harvested in the fall; some would be fed to heifers in the summer; and the remainder fed to steers at the first of the feeding period in late summer.

Livestock were assumed to be insured for fire, lightning, vehicle injury, wind, and hail during six dangerous summer months at a rate of $4.20 per $1,000 coverage.[1] Steers and heifers were assumed to be insured for $115 and $90 or 75 percent of their average value during this six month period at an approximate cost of $.50 and $.40 respectively. Personal property tax on livestock was computed at the previously calculated levy or 48.54 mills.[2] Steers would have been assessed at approximately $30 per head January 1st and taxed at $1.45 per head.[3] On the same basis, heifers were assessed at $25 per head and taxed at $1.20 each. Tax and insurance on livestock were combined on a per head basis to derive a single fixed expense charge of $1.95 for steers and $1.60 for heifers.

Insurance on livestock equipment was calculated at nine percent of the average investment which also allowed for depreciation and repair.[4] Tax on livestock equipment was calculated on the same basis as tax on buildings and improvements.[5] These charges were calculated as composite fixed expenses in a catagory with other buildings and improvements on the farm.

Tax on livestock feed was based on an average assessment of

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1. Insurance rates and information regarding common coverage was obtained from the Kansas Farm Bureau Mutual Insurance Company, Manhattan, Kansas.
2. See Appendix, Table 63, p. 129.
3. Kansas Property Valuation Department, 1960 Schedule of Valuation--Livestock and Poultry.
4. H. C. Love, H. H. Coolidge, R. D. McKinney, op. cit., p. 10.
5. See section "Real Estate Taxes", p. 52.

30 percent of market value.[1] It was assumed approximately one-half the total livestock feed was on hand January 1st for tax purposes, the same as the average investment in feed. The resulting assessed value of feed in each budget was taxed at the calculated 48.54 levy.

Prices

Recent studies recognize that when the budget method is used for comparing the profitability of alternative farming systems, it is extremely important that price relationships among various farm commodities produced for sale and all items purchased by the farmer for farm operation be accurate.

> The validity of conclusions based on budgeting is likely to be influenced greatly by the choice of prices used, regardless of the accuracy of the physical coefficients used. With price relationships changing continuously, two different sets of prices may yield opposite conclusions as to comparative profitability. Hence, the importance of a wise choice of prices.[2]

Being cognizant that if the price of one commodity was too high in relation to another, a budget in which this commodity was important would show a more favorable organization than it should. Hence, the results of the study would be misleading and the purpose of the thesis defeated. For these reasons, particular care was taken to develop a set of prices that would show the general

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1. Kansas Property Valuation Department, 1960 Schedule of Valuation--Livestock and Poultry.
2. North Central Farm Management Research Committee. Budgeting in Farm Management Research, p. 17.

expected price level and reflect the proper price relationship among various items for the proceeding five year time period.

Historical series of prices received by farmers for products they sell and prices paid by them for items purchased for farm production were of assistance in computing prices used in budgeting. Present prices for these items were also considered. Since the farm organizations proposed in this study were for the next 5 years, any factors which might have influenced these prices during this time were of course considered in the final determination of budget prices.

Livestock Prices. The author recognized the estimation of future livestock prices as a study within itself, therefore, the opinions of an experienced livestock marketing specialist were used exclusively to set the general cattle price levels and relationships.[1] It was noted that cattle inventory numbers appeared near their peak in the cattle cycle, which, judging from past history, indicated a decline in cattle prices relative to the current prices. All cattle prices are shown in Table 9 and were estimated with special consideration to market weights, grades, and dates.

Crop Commodity Prices. The determination of prices received for crop commodities presented a difficult problem because government supports rates reflected a strong influence on com-

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1. Livestock prices were determined by Professor John McCoy, Department of Agriculture Economics, Kansas State University.

Table 9. Prices for livestock at specified weight and date of transaction.[1]

Type of livestock	Price per cwt.[2]	wt.	Price per head	Approximate date
	$	lbs.	$	
Steer calves	22.00	425	93.50	Oct. 15.
Heifer calves	20.00	400	80.00	Oct. 15
Fat steers	23.00	1011	232.61	Dec. 15
Fat heifers	22.00	832	182.99	Aug. 1

1. Livestock prices were determined by John McCoy, Professor of Agricultural Economics, Kansas State University, Manhattan, Kansas.

2. Prices were for replacement calves grading good to choice and slaughter steers and heifers grading choice. Calf prices were prices paid in Anderson County, Kansas, which included marketing and transportation costs. Fat slaughter animal prices were prices at terminal markets and excluded marketing and transportation costs.

modity price levels and relationships. It was concluded that present supports rates would indicate the most accurate trend in prices. Average annual prices received in Anderson County from 1945 to 1958 were used to calculate the general relationship among various commodities. The period from 1955 through 1958 indicated a direct relationship between actual prices received and government support base rates in Anderson County. This relationship was adjusted to 1960 support rates to estimate the expected level of prices. The resulting prices were then altered slightly to conform more nearly with historical ratios. This

alteration was not of great magnitude since some price relationships were observed to be changing.

Table 10. Prices received by farmers for specified farm crop commodities.[1]

Crop	Unit	Price[2]
		$
Corn	bu.	.95
Wheat	bu.	1.75
Soybeans	bu.	1.75
Milo	bu.	.85
Oats	bu.	.55
Sorghum (silage)	ton	5.50
Alfalfa Hay	ton	16.00
Prairie Hay	ton	11.00

1. Farm Crop Prices were estimated from past trends available in Kansas State Board of Agriculture, Farm Facts for Anderson County, Kansas, 1945-1958; C.C.C. Grain Price Support Bulletins from the Federal Register for Anderson County, Kansas, 1955-1960; and average season prices for the 6th Crop Reporting District compiled by the Kansas Crop and Livestock Reporting Service, 1946-1955. Many helpful suggestions and opinions concerning these prices were offered by Assistant Professor Orlo Sorenson, Department of Agricultural Economics, Kansas State University, Manhattan, Kansas.

2. The designated price does not include transportation charges from the farm to the local markets. The general level of prices may not be correct at a particular time, but it was hoped these prices would indicate a proper relationship between the various commodities for the succeeding 3 to 5 years.

Miscellaneous Prices. Prices for miscellaneous items are listed in Table 11 and include gas and lubricants, livestock supplements, fertilizers, and seeds. These prices were set according to historical data and adjusted to 1960 dealer prices prevailing in Manhattan, Kansas.

Table 11. Prices paid by farmers for miscellaneous items.

Item	Unit	Price[1]
		$
Fuel and lubricants:		
Gas	gal.	.20
Oil	gal.	.90
Grease	lb.	.20
Livestock supplements:		
Protein supplement	cwt.	4.20
Salt and mineral	cwt.	1.25
Fertilizer and lime:		
Superphosphate (0 - 45 - 0)	ton	80.00
Mixed fertilizer (16 - 20 - 0)	ton	80.00
Ammonium nitrate (33.5% N)	ton	35.00
Lime, applied	ton	3.38
Seeds:		
Corn	bu.	11.00
Wheat	bu.	1.75
Soybeans	bu.	3.00
Milo	cwt.	16.00
Sorghum (silage)	cwt.	6.50
Alfalfa	cwt.	33.00

1. Calculated from Kansas State Board of Agriculture, Price Patterns; and 1960 dealer prices in Manhattan, Kansas.

The price of gas, oil, and greases were obtained exclusively from local dealers, and allowed for state gasoline tax refunds. Protein supplements, salt and mineral, and commercial fertilizer

prices were adjusted from historical prices to current local prices.[1]

The price of lime was calculated from information obtained from the Riley County A.S.C. Office, Manhattan, Kansas. Prices received from this office were 1960 A.S.C. payments to farmers for lime in each county in Type-of-Farming Areas 1 and 2.[2] A.S.C. payments were currently 70 percent of total cost of lime and application, from which the total cost was calculated. The cost of lime used in budgeting was $3.38 per ton, an unweighted average of the computed cost per ton of the 15 counties.

Seed prices were based on certified seed for soybeans, sorghum for silage, and alfalfa; hybrid seed for corn, and milo; and home-produced seed for wheat. Prices were estimated from historical data furnished by the State Board of Agriculture and adjusted to future prices obtained from the opinions of Manhattan seed dealers.[3] It was noted that some prices, alfalfa seed in particular, varied considerably from year to year depending on the supply, but it has hoped an accurate relationship of average prices in the succeeding 3 to 5 year time period was obtained.

Custom Rates

Custom rates for combining, field cutter operations, baling, picking corn, and hauling grain are shown in Table 12. Custom

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1. Kansas State Board of Agriculture, Price Patterns, pp. 70, 78.
2. Shown in Table 55, p. 120, in Appendix.
3. Kansas State Board of Agriculture, Price Patterns, p. 78.

rates were selected with special regard to equipment furnished by the custom operator as it fit the needs of the farm operation. A normal charge for only a field cutter, for example, would have been less than $2.00 per ton. However, small size farms in this study lacked additional equipment to haul silage from the field to silo. Consequently, a higher rate was selected to cover additional equipment costs.

Table 12. Custom rates for farm operations.

Operation	Equipment furnished by custom operator	Unit	Rate[1]
			$
Combining	Combine	Acre	4.00
Picking corn	Corn picker, 2 wagons	Acre	4.00
Baling	Baler, wagon	Ton	4.00
Forage cutting	Field cutter, 2 tractors and 2 wagons or 2 trucks	Ton	2.00
Hauling grain	Truck	Bu.	.05

1. Estimated from information cited in D. B. Jeffrey, Cecil D. Maynard, and Odel L. Walker, Oklahoma Custom Rates, 1960; Oklahoma State University leaflet L-50; and C. L. Ahrens, C. F. Bortfeld, and J. A. Hodges, 1955 Custom Rates for Farm Operations in Eastern Kansas, Kansas Agricultural Experiment Station, Agricultural Economics Report 72.

Farm Machinery and Equipment

Table 13 shows an inventory of farm equipment and machinery assumed to be necessary and economical for operation of 320 and 480 acre farms. The selection of machinery was made by referring

to "typical machines" listed in tables in the Appendix, and other equipment considered necessary on these size farms.[1]

The question of whether or not to own specific pieces of equipment is extremely important, especially on small size farms. Table 14 shows annual minimum use required to permit farm ownership of various equipment and was used as a general guide in formulating machinery and equipment inventories. This table was compiled strictly on a cost basis with no consideration to timeliness of operation. Information was not available for one row forage harvesters with custom rates on tonage basis, but it was assumed neither size farm would own one. Based on the available information, neither balers nor corn pickers were included in the machinery inventory, and combines only on the 480 acre farm.

Annual Cost of Ownership. Annual cost of ownership for farm machinery that might be found on 320 and 480 acre farms was based on percentage of the original cost, and converted to dollar values.[2] Average retail prices for 1959 and 1960 dealer prices in Manhattan, Kansas, were used for computations.[3] The annual cost to own, represented costs for housing, tax depreciation, insurance, and repair.[4] The rate when expressed in percent of

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1. Tables 56-62, pp. 121-128, in Appendix.
2. Table 64, p. 130 in Appendix.
3. G.H. Larson, G.E. Fairbanks, F.C. Fentons, What It Costs to Use Farm Machinery, Kansas Agriculture Experiment Station Bulletin 417, pp. 10, 11.
4. Ibid., p. 37. Annual costs expressed in percent of initial costs used in the study varied from rates listed in this publication. Rates used in the study did not include interest. Interest changes were calculated separately from other annual costs and were included with all other interest in "Interest on Investment". The interest charged was 6 percent annually. The difference between the two annual costs of ownership expressed in percent of initial costs was interest on the average investment or 3.3 percent (.55 X 6 percent).

Table 13. Farm equipment and machinery investment and annual cost of ownership for 320 and 480 acre farms.[1]

Machine	Size	320 Acre Farm		480 Acre Farm	
		Avg. invest.	Annual cost to own	Avg. invest.	Annual cost to own
		$	$	$	$
Blower, ensilage	15-25 hp	457	102	457	102
Combine, PTO	6 ft.			1172	304
Cultivator, mounted	2 row	204	42	204	42
Feed grinder, burr	10" with elevator	80	16	80	16
Gas barrel	300 gal.	55	8	55	8
Grain drill, fert. attch.	16 x 7	465	74	465	74
Hay rake, side delivery	4 bar	275	49	275	49
Harrow, disc, tandem	7 ft.	270	53	270	53
Harrow, drag	15 ft.	84	12	84	12
Lister, trailed, fert. attch.	2 row	184	43	184	43
Manure spreader	70 bu.	278	44	278	44
Misc. hand tools		275	49	275	49
Mower, tractor	7'	212	41	212	41
Plow, mounted	2 - 14"	154	42	154	42
Tractor	2 plow			1328	356
Tractor	3 plow	1898	509	1898	509
Trailer	4 wheel	275	51	275	51
Truck, pick up	½ ton	1232	364	1232	364
Total		6398	1499	8898	2159

1. From Table 64, p. 130 in Appendix.

Table 14. Annual minimum use for specified farm machinery to permit farm ownership.[1]

Machine	Size	Unit	Custom rate	Annual minimum use if owned
			$	
Combine, PTO	6 Foot	acre	4.00	80
Baler, PTO, twine tie	Medium duty	ton	4.00	150
Forage harvester, PTO	1 row	ton	2.00	/2
Cornpicker, MTD	2 row	acre	4.00	160

1. Calculated from Charles W. Nauheim, Carl B. Lewis, Farm Machinery Estimated Life, Usage and Duty Rates, and Costs to Own and Operate, U.S. Department of Agriculture, Agriculture Research Service, in cooperation with the Agricultural Experiment Station, K.S.U., Manhattan, Kansas. (The above bulletin was in the process of being published at the time this thesis was written.)

2. Information not available on ton basis for forage harvester and supplementary equipment.

original cost, varies due to differences in repair costs and depreciation among the various pieces of machinery.

Table 13 also shows the average investment in machinery computed at 55 percent of original value. This indicates the average value of the machine over its full life plus a salvage or trade in value of 10 percent of initial cost. The average investment was used to compute the total machinery investment and interest on working capital.

Each size farm was assumed to have miscellaneous tools and equipment such as hammers, wrenches, grinders, shovels, etc.,

initially valued at $500.[1] Annual cost to own was calculated at a rate similar to farm machinery with a 16 year life and two percent initial cost budgeted to repairs. This was thought reasonable to cover all expenses plus replacement due to loss of small size items.

Operating Cost of Machinery and Equipment. The operating cost of equipment per crop acre was calculated to include fuel, oil, and lubricant, which was based on total fuel requirements for each specified crop.[2,3] It must be noted that this amount included the total fuel consumed by all types of equipment and for all operations. Hence, the fuel cost per acre covered trucks, tractor and machinery engine consumption.

Oil and lubricant requirements and cost estimates were computed with relation to fuel cost. It was assumed average consumption of the latter two items would remain relatively constant with respect to fuel consumption over all operations. A recent study stated the relative importance of each item in the cost of operation as percentage of total operating costs.[4] This indicated fuel to be 27.4 percent, lubrication 1.7 percent, and oil 1.7 percent of total operating costs. On this basis, both the cost of oil and the cost of lubricant were calculated to be 6.2 percent of the cost of fuel.

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1. Estimate for miscellaneous tools and equipment obtained from Charlee Micheel, Agriculture Economist, USDA, ARS, at Kansas State University, Manhattan, Kansas.
2. Repairs were included in "Annual Cost of Ownership".
3. Table 6, p. 28, gives total fuel requirements.
4. G.H. Larson, G.E. Fairbanks, and F.C. Fenton, op. cit., p. 31.

Prices of fuel and oil were $.20 and $.90 per gallon respectively, and lubricant was $.20 per pound.[1] At these rates, a ratio of $.0124 or .014 gallons of oil and $.0124 or .062 pounds of lubricant were consumed per gallon of fuel at $.20. For budget purposes, oil and lubricant costs were combined to equal 12.4 percent of the fuel cost and are shown in Table 15.

Table 15. Power operating costs per acre for specified crops.

Crop and Machine	Fuel cost[1]	Oil and lube costs[2]	Annual operating costs
	$	$	$
Wheat:			
With combine	1.34	.17	1.51
Without combine	1.08	.13	1.21
Corn:			
With picker	1.92	.24	2.16
Without picker	1.55	.19	1.74
Soybeans:			
With combine	1.67	.21	1.88
Without combine	1.36	.17	1.53
Milo:			
With combine	1.56	.19	1.75
Without combine	1.33	.16	1.49
Sorghum for silage:			
With forage cutter	2.93	.36	3.29
Without forage cutter	2.30	.29	2.59
Alfalfa:[3]			
With baler	2.17	.27	2.44
Without baler	1.38	.17	1.55

1. Calculated from fuel requirements in Table 6 at $.20 per gallon.
2. Calculated from information provided in G.H. Larson, G.E. Fairbanks, and F.C. Fenton, What It Costs to Operate Farm Machinery, Kansas Agricultural Experiment Station Bulletin 417. Oil and lubricant were calculated to be 12.4 percent of fuel cost.
3. Alfalfa was established every four years, consequently ¼ the cost of establishing a new stand was charged in addition to the annual harvest cost.

1. Table 11, p. 43.

Farm Real Estate Values

The present value of farm real estate was calculated from 1955 average values per acre for land in farms in Type-of-Farming Areas 1 and 2.[1] These values were inflated to a 1959 level by means of index values based on 1957-49 averages.[2] This method indicated a 1959 value of $86.76 per acre in Type-of-Farming Area 1 and $94.49 per acre for Type-of-Farming Area 2. The weighted average value per acre for these two areas was $91.39 which was raised and rounded to $92.00, and was the per acre value used in budgeting. This estimate included both land and buildings which was not suitable for calculating depreciation, repair, and insurance on the farm improvements. Department of Agriculture figures indicated approximately 15 percent of the total land value in Kansas was farm dwellings and service buildings.[3] On this basis the value of land less improvements was $78.20 per acre and the investment in buildings and improvements was $13.80 per acre.

In the past decade farm real estate values have increased tremendously due to expansion of farm size to handle modern equipment and make use of economies of scale; demand for non-farm purposes; demand of persons not engaged in farming for purposes of

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1. Harold H. Ramsbacher, Wilfred H. Pine, Merton L. Otte, and J. E. Pallesen, Trend in Land Values in Kansas, Kansas Agricultural Experiment Station Bulletin 422, p. 12.
2. Ibid., p. 22.
3. U.S. Department of Agriculture, Current Developments in the Farm Real Estate Market, Agricultural Research Service, May 1960, p. 28.

investment; hedging against inflation; personal satisfaction and prestige; etc. However, some authorities predict a leveling off and possible decline in real estate values due to a recent decrease in demand.[1] Since farm real estate values were adjusted to 1959 levels for budget purposes, further inflation of real estate values was thought to be an intangible measure and could not be expected to give a more accurate indication of average farm real estate value for the next five years than basic 1959 values.

Real Estate Taxes

Real estate and personal property tax rates were derived from 1959 tax rolls which gave the 1959 tax levy for each county in Type-of-Farming Areas 1 and 2.[2] A weighted average was calculated by dividing the total tax collected by the total assessed

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1. Federal Reserve Bank of Kansas City, "Is the Farm Real Estate Boom Ebbing?", Monthly Review, p. 15

Although the influences that have been responsible for increased farm real estate values in recent years will continue to exert an upward pressure on values, it does not appear probable that demand will be as strong as in the 1950's if present trends in agriculture continue. The competitive struggle of farmers to increase their incomes by adopting new technology and expanding their operations will continue to be an important influence on the real estate market as well as on other phases of the agriculture economy. However, the continuance of surplus productive capacity in agriculture will continue to dominate the outlook for farm income, which may be a stronger influence in the real estate market than in many recent years.

2. Unpublished information was provided on request by Kansas State Property Valuation Department, Topeka, Kansas.

value for all counties. A 48.54 mill levy resulted and was used as a basis for computing all real estate and personal property taxes except machinery.[1] Taxes on personal property are treated thoroughly in sections on "Livestock Budget Requirements" and "Farm Machinery and Equipment".

Taxes on real estate were calculated for budgeting at $1.41 per $100 full value. The full value of all real estate in the 15 county area was computed by using 1958 ratios of assessed tax value to full value.[2] Since the ratios varied considerably among different counties, the full value was calculated for each county. The full value for all counties was divided into the total assessed value for all counties to obtain a weighted average ratio of 29 percent assessed value to full value. The total tax for all counties was divided by the total full value of real estate in all counties to give the $1.41 per $100 full value rate.

Hired Labor

An estimation of necessary hired labor was calculated to supplement labor of the farm operator during particular busy periods. Labor requirements indicate field labor required for specified croping operations.[3] It was obviously impossible for

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1. Taxes on machinery were computed at one percent of original cost which included personal property tax and sales tax. G. H. Larson, G. E. Fairbanks, and F. C. Fenton, op. cit., p. 22.
2. Kansas Property Valuation Department, Real Estate Assessment Ratio Study, 1958.
3. Tables 56 - 62, pp. 121 - 128, in Appendix.

one operator to efficiently perform all the necessary duties, so hired labor was assumed in either the case of farm owned equipment or custom hired equipment. For example, one man could not drive a combine and haul grain, or drive a forage cutter and haul ensilage to the silo at the same time. In all cases, it was assumed custom operations would furnish one man's labor. Since all field labor was included in the total requirements, it was necessary to subtract the amount of labor hired from the total requirements to compute the hours of labor contributed by the farm operator.

Requirements for hired labor, shown in Table 16, specify needs for both home ownership of major harvesting equipment and of custom work. This calculation was based on total labor requirements in the Appendix. It was assumed the farm operator and custom operator would furnish labor equivalent to the number of hours major harvesting equipment was in the field. Labor requirement in addition to that furnished by the farm operator, or farm operator and custom operator (depending on whether the farm operator owned the major harvesting equipment or hired custom work) for harvesting operations was assumed to be hired. The calculation was accordingly based on hours of hired labor per hour of major equipment operation and then converted to hired labor per acre, depending on the machine's operating capacity.

It was economically feasible for operators of small farms to exchange their labor with neighbors and was probably a common practice in southeast Kansas. When work periods requiring labor

in excess of that furnished by the operator arose, it was very probable that work on different farms would not exactly coincide, therefore, making the exchange of labor a very sound practice. However, budgets in this study allowed expense items for hired labor during combining, corn picking, baling, and silage cutting. This procedure simplified crediting and debiting various labor arrangements among neighboring farmers.

Table 16. Annual hours hired labor required per acre for harvest of specified crops.

Operation	Hours labor hired per acre[1]	
	Home ownership of major harvesting equipment	Custom work
Baling alfalfa hay	5.0	3.7
Combining		
Wheat	.7	None
Milo	.9	None
Soybeans	.9	None
Picking corn	1.3	None
Forage cutting	8.6	7.1

1. Sufficient labor was assumed to be furnished by the farm operator and custom operator for custom combining and corn picking operations if the farm operator hauled while the custom operator operated the machine.

Wages of hired labor were calculated from average hourly wage rates in Kansas for 1959 and 1960, not including board and room. The average hourly wage rates were $1.10 and $1.13 for 1959 and 1960 respectively during July.[1] There was considerable

1. Farm Labor, Crop Reporting Board, Agricultural Marketing Service, U.S. Department of Agriculture, July 11, 1960, pp. 6,7.

fluctuation in hourly wage rates for the preceding years, but a slightly increasing wage rate was predominent. Therefore, an average wage of $1.15 per hour was established to compute the cost of labor hired on the farm. It was further presumed that most farm labor hired for only a few days would have at least one meal furnished by their employer, but for budget purposes, this cost was assumed to be included in the estimated hourly wage rate.

DEVELOPMENT OF THE REPRESENTATIVE 320 AND 480 ACRE FARMS

Cockrane and Butz express well a representative dairy farm in northern Pennsylvania. Borrowing their ideas, these 320 and 480 acre representative general farms in Anderson County, Kansas do not actually exist and never did but represent general farms of these two size groups in the county. If dropped from the sky in Anderson County, they would be described as general farms as regards size and organization.[1] It is with such a representative general farm this study begins and procedes to deviate to primarily livestock and primarily cash crop organizations.

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1. Willard W. Cockrane and William T. Butz, "Output responses of Farm Firms," Journal of Farm Economics, November 1951, 33: part 1.

Thus, our firm does not actually exist and never did exist, but it is representative of singly-enterprise dairy farms in the area. If dropped from the sky into northeastern Pennsylvania, it would be described as a typical single-enterprise unit as regards size, organization, and practices.

Selection of Farm Size

In applying needed adjustment to epecific farming eituatione in eoutheaetern Kansas, the problem was encountered of determining whet size farms ehould be used in the preparation of farm budgete. The eize of farms to be ueed wae determined by limiting off farm resourcee, operatore available lebor, and by referring to size of farm claeeificatione in the 1950 and 1954 Censue of Agriculture.

Farm organizations were not developed for farms much lese than 320 acres in size. It was acknowledged that there were meny ferms under 320 acrse in size in eoutheaet Kansae. However, unlese large amounte of off-farm reeources were brought to the emaller sized farms to cerry on an inteneive type of farm production, for example dairying, it wae extremely difficult to have an adequate ferm income. In developing the general farme, one aesumption wae that few off farm reeources would be ueed.

Farm organizations were not coneidered for farms much over 480 acree in eize. Thee farm organizatione which were developed ere built around the labor of one man plue a little additional hired help. Unlese a farm ie a cattle ranch, in order to utilize fully non-lebor reeources, a considerable amount of hired help would be neceesary.

Table 17 ehows the dietribution of farms by eize as percent of all farms in Type-of-Farming Areae 1 and 2. From 1950 to 1954, all claeeificatione of farms with 220 acree or lee di-

minished as percent of all farms and the 220-259 class increase was negligable. In 1954, 21.2 percent of all farms were included in the 260 to 499 acre class, and increase of 2.7 percent above the 1950 level. Furthermore, the total number of farms decreased 11.7 percent from 1950 to 1954. The implication noted was a trend toward fewer, but larger size farms and with an increase in the 260 to 499 acre classification.

Table 17. Percent of farms by size group, average of Type Farming Areas 1 and 2, Kansas, 1950 and 1954.[1]

Size group	1950		1954	
	Number	Percent	Number	Percent
acres				
Under 70	6,957	25.8	5,574	23.4
70-99	3,079	11.4	2,545	10.7
100-139	2,198	8.1	1,817	7.6
140-179	4,062	15.0	3,318	13.9
180-219	2,035	7.5	1,613	6.8
220-259	2,158	8.0	2,005	8.4
260-499	5,004	18.5	5,058	21.2
500-999	1,284	4.8	1,634	6.8
1000 and over	233	.9	285	1.2
All size groups	27,010	100.0	23,849	100.0

1. Calculsted from 1954 Census of Agriculture.

It was thought that farmers previously operating smaller farms were finding it essential to increase their size of operations,

hence the increase in the number of farms in the 260 to 499 acre farm classification. Therefore, the size farms selected for this study were chosen from this category.

To provide a complete analysis of the prevailing situation, 320 and 480 acre units were developed to represent the size farms indicated above. This choice was thought to furnish information for the most critical segment of the agriculture economy in southeastern Kansas, and be of service to the greatest number of people.

Land Use and Livestock Numbers

As mentioned previously, three organizations were developed for this study--general farm (livestock, and cash grain), a primarily livestock farm, and a primarily cash grain farm. In all three organizations and in both size farms, the proportion of cropland, pasture, and waste, remained constant as a percentage of the total acres.[1] Consequently, the 320 acre farm always had 170 acres cropland, 130 acres pasture, and 20 acres waste, while the 480 acre farm had 255 acres cropland, 195 acres pasture, and 30 acres waste. This assumption was based on the representative farm concept which was assumed throughout the thesis.

The distribution of cropland among the various crops varied according to the specific organization, and number of livestock.

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1. Cropland, pasture, and waste as percent of total land in farms in Type-of-Farming Areas 1 and 2 is shown in Table 1, p. 7.

Wheat acreage remained constant according to the maximum acreage allotment for all organizations within each size farm; 30 acres on the 320 acre farm and 55 acres on the 480 acre farms.[1] The acreage of corn and milo was also left unchanged on alternative organizations to test the effects of land resource allocation between competition of cash crops (soybeans) and roughage for cattle (alfalfa and sorghum silage).

The General Farm. All crop acreages in the general farm were derived from the 1958 Assessor's Rolls for nine counties in Type-of-Farming Areas 1and 2.[2] The distribution of crop acres resulting was considered representative of the area and was inserted into the budgets for the general farms. This distribution was the basis for fixing wheat, milo, and corn acreages in each of the three alternative organizations. Wheat and soybeans were sold as cash crops, and all milo, corn, sorghum for silage and alfalfa hay were fed to livestock.

The number of livestock on the general farm was also based on the Assessor's Rolls. The exact number was determined by the available feed and pasture. Enough deferred steers were introduced to utilize all the pasture on the farm and enough additional

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1. Information on wheat acreage allotments provided by U.S.D.A., Agriculture Research Service, Manhattan, Kansas. A random sample of every third farm with wheat allotments in Anderson County was taken from 1958 A.S.C. records. If the farm was near 320 or 480 acres, it was tallied and the average allotment computed.

2. 1958 Assessor's Rolls were obtained for Crawford, Labette, Neosho, Montgomery, Anderson, Coffee, Franklin, Linn, and Osage Counties. Land and livestock numbers were tabulated for farms approximating 320 and 480 acre sizes and average data computed.

heifers for wintering and fattening to utilize all grain and roughage not consumed by the deferred steer program. This organization marketed all roughage and feed grains produced on the farm through the livestock program. No feed was purchased except protein supplement and salt and mineral.

The Primarily Livestock Farm. The farm was organized to carry a large number of livestock. As stated above, wheat, milo, and corn acreages remained constant with the same size farm. However, to permit an increased number of cattle to be carried in the organization, soybeans (cash crop) were eliminated from the croping system and the acreage substituted for additional production of sorghum for silage and alfalfa.

Since pasture acreage was held constant for each alternative system, the number of deferred steers remained the same within the different organizations. Increased production of roughage in the primarily livestock farm allowed a greater number of heifers to be carried to utilize all the home grown roughages.[1] This increased inventory of cattle required the purchase of feed grain in addition to that produced on the farm.

The Primary Cash Grain Farm. This organization was introduced into the study to compare the benefits of increasing acreages of cash crops as livestock numbers decreased. The only livestock in this organization was deferred fed steers. The number of head

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1. 98 heifers on primarily livestock organization vs. 42 heifers on general organization for 320 acre farm; 128 heifers on primarily livestock organization vs. 60 heifers on general organization for 480 acre farm.

carried was equal to the other organizations to utilize all available pasture. This allowed some cropland to be taken out of roughage and an equivalent amount substituted into the production of soybeans.

A surplus quantity of home produced feed grains resulted from the diminished cattle numbers and total feed grain requirements. Therefore, excess corn, wheat, and a greater quantity of soybeans were sold as cash crops. Deferred steers were the only livestock product sold.

Analysis of the Budget

Each of these farm organizations was budgeted for both 320 and 480 acre farms. An analysis of these budgets is presented in the following sections. A brief description and definition of the terms and method used was thought necessary to provide the reader with a better understanding of the analysis.

Investment. Capital investments by the farmers were taken into consideration. Since capital requirements vary for each farm organization, the interest changes can be important in influencing the return.

Labor and Power Requirements. Hours of labor and power hours were estimated for each farm organization. The hours of power included both tractors and truck hours, but was thought to give an indication of the annual use of this equipment.

The annual hours of the operator's labor were derived by

totaling the operators labor hours required by both crops and livestock and adding ten percent to this amount to represent miscellaneous labor such as mowing weeds, etc., for the man hour total. Hired labor was not included in this amount, hence the total labor requirements were operator's labor plus hired labor.

Standards for total farm labor available were those used in Farm Management account books.[1] Three hundred 10 hour days were assumed to be reasonable to provide 3,000 hours of labor annually per operator.

Gross Farm Income. Gross farm income was composed of livestock net receipts and crop receipts. Crop receipts were totals of all crop production sold. Net livestock receipts were total gross livestock sold minus total purchase price.

Farm Expenses. Total expenses were the sum of fixed expenses and all cash expenses. Cash expenses were divided into cash crop expenses, cash livestock expenses and cash miscellaneous expenses. Fixed expenses included all tax, insurance, depreciation, repair, and housing costs of capital assets. Depreciation, repair, and insurance on real estate and farm buildings was computed at nine percent of full inventory value.[2] All other fixed expenses have been described previously.

Cash crop expenses were composed of total seed, fertilizer and lime, machinery operating costs, cash livestock expenses, as

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1. Kansas Farm Management Association Account Book, Extension Division, Kansas State University, Manhattan, Kansas, Form 2.
2. H. C. Love, J. H. Coolidge, F. D. McKinney, More Money from Your Farm, Extension Service Circular 244, p. 15.

stated previously, included veterinary fees and medicine expense, all livestock feed bought, machinery operating cost, marketing cost, and the expense of hauling milo if it was bought.

Cash miscellaneous expenses include farm share of auto, utilities, and farm dues and fees. These expenses were based on Kansas Farm Management records for Association No. 6.[1] The farm share of auto expenses was assumed to be $260 and $280 on 320 acre and 480 acre farms respectively. Utilities were $140 for the 320 acre farm and $160 for the 480 acre farm. Farm dues and fees included Farm Management dues, farm magazines, etc., and was assumed to be $140 on both size farms.

Means Used for Comparing Financial Returns of Farms. For the analysis of this thesis, two measures of the financial returns for farming were used:

1. Net Farm Income--this is the total gross farm income minus total farm expenses. The farm income is the return for the operator's labor and management farm family labor and the return for the operator's total farm investment.
2. Return to Operator's Labor and Management--this is determined by subtracting from the net farm income:
   (a.) Interest on real estate at five percent, and interest on net working capital at six percent.[2]

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1. Farm Management Summary and Analysis Report, Extension Service, Kansas State University, Manhattan, Kansas, 1958 and 1959.
2. Pine, Wilfred H., John H. Coolidge, and Victor Jacobs, Making An Equitable Farm Lease, Kansas Agricultural Experiment Station Circular 233.

(b.) Estimated value of unpaid family labor. However, in this study, no family labor was considered.

For this analysis, the return to labor and management was the most meaningful. This was because, whether the farm was free of debt or whether there was an encumbrance on the farm, return to operator's labor and management remained the same.

THE 320 ACRE FARM

The 320 acre farm was the smaller of the two size farms tested in this analysis. The reader will find the operator's return to labor and management was small, or even negative as in the case of the cash crop farm. Furthermore, full benefit of the operator's available labor was not utilized on this small size farm. In short, the operation lacked sufficient scale to be considered successful.

The General Farm

The term general farm is what may be considered a diversified farm. That is a farm on which there are several important sources of farm receipts. The sources of income for this general farm were deferred steers, wintered and fattened heifers, wheat, and soybeans.

Investment. The investment required on this farm was $51,239. A breakdown of the investment is presented in Table 18. It was

noted that 58 percent of the investment was in fixed capital and 42 percent in working capital.

Table 18. Investment required to operate a 320 acre general farm.

Item	: Investment	
	$	$
Fixed Capital:		
Land	25,024	
Bldge. and livestock equipment	4,811	
Total Fixed Capital		29,835
Working Capital:		
Livestock	11,077	
Feed	2,674	
Machinery	6,398	
Fertilizer	1,305	
Total Working Capital		21,454
Total Investment		51,289

Crops. The cropland in this farm organization was devoted to wheat, corn milo, soybeans, sorghum silage and alfalfa in amounts that might be commonly found in Southeastern Kansas. The number of acres, production, disposition and dollar return of various crops are shown in Table 19.

Wheat and soybeans were sold as cash crops to return $1,922, and the remainder of the crop production was fed to livestock. Twelve percent of the land was in alfalfa legume. If alfalfa was rotated every four years, all cropland would have the soil building benefits of a legume every 33 years.

Table 19. Land use, production, crop disposition on 320 acre, general farm.

Land use	Acres	Unit	Production		Crop disposition				
					Farm		Sold		
			Yield	Total	Seed	Feed	Quanity	Price	Return
								$	$
Cropland:									
Wheat	30	bu.	28	840	42		798	1.75	1397
Corn	55	bu.	34	1870		1870		.95	
Milo	33	bu.	32	1056		1056		.85	
Soybeans	20	bu.	15	300			300	1.75	525
Sorghum (silage)	12	ton	9	108		108		5.50	
Alfalfa	20	ton	2.5	50		50		16.00	
Total Cropland	170								
Pasture	130								
Fmstd., waste, etc.	20								
Total	320								1922

Crop expenses are presented in Table 20. Considerable custom work was hired, which accounted for about 33 percent of the total crop expenses. Approximately one-third of this custom work expense was for combining, because the small combine acreage did not permit economic farm ownership of the machine. The largest cash crop expense item was $1,305 for fertilizer and lime. This constituted about 45 percent of the total crop expenses.

Table 20. Crop expense items for 320 acre, general farm.

Crop	Seed	Fertilizer and lime	Machine operating cost	Custom work hired	Labor hired	Total
	$	$	$	$	$	$
Wheat		266	36	120		422
Corn	76	547	87	220		930
Milo	26	223	49	132		430
Soybeans	36		31	80		147
Sorghum (silage)	7	81	28	216	98	430
Alfalfa	25	72	28	200	85	410
All cropland		116				116
Total	170	1305	259	968	183	2885

Livestock. This farm had 79 head of livestock in deferred steer and winter and fattening heifer programs. Thirty-seven deferred steers were carried to utilize the pasture and 42 wintered and fattened heifers were bought to consume the surplus quantities of grain and roughage produced on the farm. Livestock purchases, sales, and net receipts are given in Table 21. Total net receipts from livestock were $9,473. Livestock expenses are discussed in detail in the following income and expense summary.

Table 21. Livestock purchaees, sales, and net receipte on the 320 acre general farm.

Liveetock	No. head	Purchaeed	Sold	Net receipte
		$	$	$
Steere	37	3,460	8,607	5,147
Heifere	42	3,360	7,686	4,326
Total Liveetock	79	6,820	16,293	9,473

Labor and Power Requiremente. Labor and power requirements are presented in Table 22. The operator'e labor wae devoted to crop production about 55 percent of the time. Livestock care and production occupied 35 percent of hie time and miscellaneous dutiee and management the other 10 percent. The total operator's labor wae only 1,694 houre per year. On a basis of 3,000 hours annual labor available from the operator and hie family, only 56 percent of the available labor wae ueed. The implication wae that this farm organization ehould be expanded to make full use of the operator'e labor.

Income and Expense Summary. The income and expenee eummary for the 320 acre general farm ie presented in Table 23. Eighty-three percent of the gross income came from net livestock receipts, and the reet from crope to give a total gross inoome of $11,429.

Total expenses were $7,799 which was 68 percent of the total gross inoome. Caeh fixed expeneee were $2,496 or 32 percent of the total expense. Crop expensee were the largest expenee iteme,

Table 22. Labor and power requirements on 320 acre, general farm.

Item	No. units	Total hours for crops and livestock: Operators labor	Hired labor	Total labor	Power /1
		(Hours)	(Hours)	(Hours)	(Hours)
Crops	(Acres)				
Wheat	30	119		119	109
Corn	55	357		357	324
Milo	33	174		174	156
Soybeans	20	110		110	98
Sorghum (silage)	12	87	85	172	106
Alfalfa	20	97	74	171	101
Total	170	944	159	1103	894
Livestock	(Head)				
Steers	37	315		315	185
Heifers	42	281		281	189
Total	79	596		596	374
Misc. labor		154		154	
Total crops and livestock		1694	159	1853	1268

1. Includes truck and tractor hours.

Table 23. Income and expense summary for 320 acre, general farm.

	$	$	$
INCOME			
Steers[1]	5,147		
Heifers[1]	4,326		
Wheat	1,397		
Soybeans	525		
Gross farm income			11,429
EXPENSES			
Cash Livestock Expenses:			
Vet. fees and medicine	158		
Feed bought	1,255		
Machine operating cost	103		
Marketing cost	362		
Total		1,878	
Cash Crop Expenses:			
Seed	170		
Fertilizer and lime	1,305		
Machinecoperating cost	259		
Custom work hired	968		
Labor hired	183		
Total		2,885	
Cash Miscellaneous Expense:			
Auto, farm share	260		
Utilities	140		
Farm dues and fees	140		
Total		540	
Fixed Expenses:			
Land[2]	353		
Bldgs. and livestock equipment[3]	501		
Livestock[4]	139		
Feed[2]	4		
Machinery[5]	1,499		
Total		2,496	
Total expenses			7,799
NET FARM INCOME			3,630
INTEREST ON INVESTMENT			2,779
RETURN TO LABOR AND MANAGEMENT			851

1. Income from livestock was specified as total sales minus total purchase cost.
2. Tax.
3. Tax depreciation, repair, and insurance.
4. Tax and insurance.
5. Tax, insurance, depreciation, repair, and housing.

totaling $2,885, which comprised 37 percent of the total expenses. Livestock expenses were only $1,878 or 24 percent and miscellaneous expenses $540 or 7 percent of the total farm expenses.

Farm Return. The two measures of financial return for this farm were net farm income which was $3,630, and $851 return to labor and management derived by subtracting $2,779 interest on investment from the net farm income.

The Primarily Livestock Farm

This farm organization deviated from the preceeding general farm by introducing more livestock and diminishing the acreage of cash crops. Consequently, the most important sources of income were deferred steers, and wintered and fattened heifers. The only crop sold for cash was wheat.

Investment. The investment on this farm was $58,886. Fifty-one percent of this investment was fixed capital and 49 percent was working capital. Investments for various purposes are presented in Table 24.

Crops. Soybeans for a cash crop were eliminated from this farm organization to allow increased production of alfalfa and sorghum silage for livestock feed. Wheat, corn, and milo acreages were the same as on the general farm. Table 25 shows the acres, production, disposition, and gross income of the various crops.

The total gross income from crops was $1,397 which was provided entirely by wheat. Alfalfa occupied 18 percent of the

Table 24. Investment required to operate a 320 acre, primarily livestock farm.

Item	Investment	
	$	$
Fixed Capital:		
Land	25,024	
Bldgs. and livestock equipment	5,091	
Total Fixed Capital		30,115
Working Capital:		
Livestock	16,621	
Feed	4,343	
Machinery	6,398	
Fertilizer	1,409	
Total Working Capital		28,771
Total Investment		58,886

total cropland, which, assuming the stand lasted four years, would allow a legume to be planted on all cropland every 22 years.

As shown in Table 26, custom work accounted for over one-third of the crop expenses. However, only 20 percent of this expense was due to custom combining since soybeans were eliminated from the cropping system. The increased acreage in sorghum silage and alfalfa was responsible for causing custom baling and silage cutting to account for 60 percent of the custom work expense. Fertilizer and lime were the largest crop expense items constituting 43 percent of the total crop expense.

Livestock. Since this farm organization was predominately directed toward livestock production, 135 head of cattle were handled. All available pasture was utilized by 37 deferred steers, and with 98 wintered and fattened heifers, consumed all the roughage grown on the farm. However, the farm did not produce sufficient grain to fatten the cattle for market, so 1744

Table 25. Land use, production, crop disposition on 320 acre, primarily livestock farm.

Land Use	Acres	Unit	Production		Crop disposition				
					Farm		Sold		
			Yield	Total	Seed	Feed	Quanity	Price	Return
								$	$
Cropland									
Wheat	30	bu.	28	840	42		798	1.75	1,397
Corn	55	bu.	34	1,870		1,870		.95	
Milo	33	bu.	32	1,056		1,056		.85	
Sorghum (silage)	22	ton	9	198		198		5.50	
Alfalfa	30	ton	2.5	75		75		16.00	
Total Cropland	170								
Pasture	130								
Fmstd., waste, etc.	20								
Total	320								1,397

Table 26. Crop expense items for 320 acre, primarily livestock farm.

Crop	Seed	Fertilizer and lime	Machine operating cost	Custom work hired	Labor hired	Total
	$	$	$	$	$	$
Wheat		266	36	120		422
Corn	76	547	87	220		930
Milo	26	223	49	132		430
Sorghum (silage)	13	149	57	396	179	794
Alfalfa	37	108	47	300	128	620
All cropland		116				116
Total	152	1,409	276	1,168	307	3,312

bushels of milo were bought for $1,482. It was assumed this grain was hauled by a custom trucker for an additional cost of $87.

Livestock purchases, sales, and net receipts are presented in Table 27. The total net receipts from livestock was $15,240. Livestock expense items not previously discussed are treated in the income and expense summary which follows.

Table 27. Livestock purchases, sales, and net receipts on the 320 acre, primarily livestock farm.

Livestock	No. Head	Purchased	Sold	Net Receipts
		$	$	$
Steers	37	3,460	8,607	5,147
Heifers	98	7,840	17,933	10,093
Total Livestock	135	11,300	26,540	15,240

Labor and Power Requirements. Requirements for labor and power are presented in Table 28. Crop and livestock production each occupied about 45 percent of the operator's labor. Miscellaneous work accounted for the remaining 10 percent. The operator's total labor for the year was 2,118 hours, which means if 3,000 hours per year was available, 70 percent of his available labor was devoted to the farm enterprise. To utilize all labor available, the operator should probably develop his farm organization more fully.

Income and Expense Summary. A summary of income and expense for this farm is presented in Table 29. In accordance with the primarily livestock organization, livestock net receipts accounted for 92 percent of the total gross income. The remainder came from wheat sold which resulted in $16,637 total gross income.

Total expenses were $11,162, which were 68 percent of the total gross income. Because the livestock enterprise was large and considerable feed grain was purchased, cash livestock expenses was the largest expense item--42 percent of the total expense. Cash crop expense was 30 percent which was next in relative importance. Fixed expenses constituted 23 percent and miscellaneous expenses 5 percent of the total expense items.

Farm Return. The return to labor and management was $2,243 which was derived by subtracting $3,232 interest on investment from $5,475 net farm income.

Table 28. Labor and power requirements on 320 acre, primarily livestock farm.

Item	No. units	Total hours for crops and livestock: Operators labor	Hired labor	Total labor	Power[1]
		(Hours)	(Hours)	(Hours)	(Hours)
Crops	(Acres)				
Wheat	30	119		119	109
Corn	55	357		357	324
Milo	33	174		174	156
Sorghum (silage)	22	159	156	315	194
Alfalfa	30	145	111	256	151
Total	170	954	267	1,221	934
Livestock	(Head)				
Steers	37	315		315	185
Heifers	98	657		657	441
Total	135	972		972	626
Misc. labor		192		192	
Total crops and livestock		2,118	267	2,385	1,560

1. Includes truck and tractor hours.

Table 29. Income and expenses summary for 320 acre, primarily livestock farm.

	$	$	$
INCOME			
Steers[1]	5,147		
Heifers[1]	10,093		
Wheat	1,397		
Gross farm income			16,637
EXPENSES			
Cash Livestock Expenses:			
Vet. fees and medicine	270		
Feed bought	3,568		
Feed grain hauled	87		
Machine operating cost	173		
Marketing cost	595		
Total		4,693	
Cash Crop Expenses:			
Seed	152		
Fertilizer and lime	1,409		
Machine operating cost	276		
Custom work hired	1,168		
Labor hired	307		
Total		3,312	
Cash Miscellaneous Expenses:			
Auto, farm share	260		
Utilities	140		
Farm dues and fees	140		
Total		540	
Fixed Expenses:			
Land[2]	353		
Bldgs. and livestock equipment[3]	530		
Livestock[4]	229		
Feed[2]	6		
Machinery[5]	1,499		
Total		2,617	
Total Expenses			11,162
NET FARM INCOME			5,475
INTEREST ON INVESTMENT			3,232
RETURN TO LABOR AND MANAGEMENT			2,243

1. Income from livestock was specified as total sales minus total purchase cost.
2. Tax.
3. Tax depreciation, repair, and insurance.
4. Tax and insurance.
5. Tax, insurance, depreciation, repair, and housing.

The Primarily Cash Crop Farm

The term cash crop signifies special emphasis on selling crops directly from the farm for cash income. This farm produced wheat, corn, and soybeans as important sources of income, but were supplemented by feeding deferred steers.

Investment. Investments on this farm were divided into separate items and shown in Table 30. The total investment is $44,706 of which 66 percent is land and buildings and 34 percent allocated to various catagories of working capital.

Crops. The cropland in this organization had the same amount of wheat, milo, and corn as the general farm, but about twice as many acres of soybeans. Since fewer cattle were carried in the livestock system, less acreage was devoted to sorghum silage and alfalfa to provide adequate roughage for the steers. Excess corn not fed to livestock; wheat, and soybeans were sold as cash crops. The land use, production, disposition, and gross return from crops are presented in Table 31.

The gross income from wheat, milo, and corn was $3,613. Alfalfa occupied only six percent of the total cropland. Based on a four year stand and rotated to different cropland each time it was established, alfalfa legume would be grown on each acre of cropland every 67 years.

Crop expenses are shown in Table 32. One-half the custom work hired was for combining small grains. The largest expense was for fertilizer and lime which was 47 percent of the total crop expense.

Table 30. Investment required to operate a 320 acre primarily cash crop farm.

Item	Inveetment	
	$	$
Fixed Capital:		
Land	25,024	
Bldgs. and liveetock equipment	4,601	
Total Fixed Capital		29,625
Working Capital:		
Livestock	6,031	
Feed	1,423	
Machinery	6,398	
Fertilizer	1,229	
Total Working Capital		15,081
Total Investment		44,706

Livestock. Thie farm had only enough deferred fed steers to utilize the pasture. These 37 eteers did not coneums all the feed grain produced on the farm eo all milo and eome corn was fed to meet the feed requirsmente. All corn not fed wae eold as a caeh crop. The steers consumed all the alfalfa and sorghum silage produced on ths farm.

The total eales for the 37 deferred eteers amounted to $8,607, minue the purchaee price of $3,460 left net receipts of $5,147 for livestock. Livestock expeneee are treated thoroughly in the income and expenee summary.

Labor and Power Requiremente. Table 33 gives the calculated labor and power requiremente for thie farm. Sixty-eight percent of the operator's labor wae epend in crop production. Liveetock production occupied only 22 percent of hie labor and

Table 31. Land use, production, crop disposition on 320 acre, primarily cash crop farm.

Land use	Acres	Unit	Production		Crop disposition				
					Farm		Sold		
			Yield	Total	Seed	Feed	Quanity	Price	Return
								$	$
Cropland									
Wheat	30	bu.	28	840	42		798	1,75	1,397
Corn	55	bu.	34	1,870		588	1,282	.95	1,218
Milo	33	bu.	32	1,056		1,056		.85	
Soybeans	38	bu.	15	570			570	1.75	998
Sorghum (silage)	6	ton	9	54		54		5.50	
Alfalfa	10	ton	2.5	25		25		16.00	
Total Cropland	170								
Pasture	130								
Fmstd., waste, etc.	20								
Total	320								3,613

Table 32. Crop expense items for 320 acre, primarily cash crop farm.

Crop	Seed	Fertilizer and lime	Machine operating cost	Custom work hired	Labor hired	Total
	$	$	$	$	$	$
Wheat		266	36	120		422
Corn	76	547	87	220		930
Milo	26	223	49	132		430
Soybeans	68		58	152		278
Sorghum (silage)	35	41	16	108	49	249
Alfalfa	12	36	16	100	43	207
All cropland		116				116
Total	217	1,229	262	832	92	2,632

miscellaneous labor the remaining 10 percent. The operator's total labor was 1,390 hours per year or 46 percent of the available 3,000 hours. Since the farm required less than one-half of the total labor available, it was strongly implied that the existing farm organization was not making full use of the operator's labor resource.

Income and Expense Summary. The income and expense summary for this farm is presented in Table 34. It was noted that 41 percent of the gross income was derived from cash crop sales and the remainder from livestock net receipts to give $8,760 total gross farm income. This showed greater emphasis on cash crop receipts than the other two organizations.

Total expenses were $6,520 or 74 percent of the gross income. Cash crop expenses contributed the most to total expenses--$2,632 or 40 percent. Fixed expenses constituted 37 percent of

Table 33. Labor and power requirements on 320 acre, primarily cash crop farm.

Item	No. units	Total hours for crops and livestock: Operators labor	Hired labor	Total labor	Power /1
		(Hours)	(Hours)	(Hours)	(Hours)
Crops	(Acres)				
Wheat	30	119		119	109
Corn	55	357		357	324
Milo	33	174		174	156
Soybeans	38	208		208	186
Sorghum (silage)	6	43	43	86	53
Alfalfa	10	48	37	85	50
Total	170	949	80	1,029	878
Livestock	(Head)				
Steers	37	315		315	185
Total	37	315		315	185
Misc. labor		126		126	
Total crops and livestock		1,390	80	1,470	1,063

1. Includes truck and tractor hours.

Table 34. Income and expense summary for 320 acre, primarily cash crop farm.

	$	$	$
INCOME			
Steers[1]	5,147		
Wheat	1,397		
Soybeans	998		
Corn	1,218		
Gross farm income			8,760
EXPENSES			
Cash Livestock Expenses:			
Vet. fees and medicine	74		
Feed grain hauled	631		
Machine operating cost	51		
Marketing cost	187		
Total		943	
Cash Crop Expenses:			
Seed	217		
Fertilizer and lime	1,229		
Machine operating cost	262		
Custom work hired	832		
Labor hired	92		
Total		2,632	
Cash Miscellaneous Expenses:			
Auto, farm share	260		
Utilities	140		
Farm dues and fees	140		
Total		540	
Fixed Expenses:			
Land[2]	353		
Bldgs. and livestock equipment[3]	479		
Livestock[4]	72		
Feed[2]	2		
Machinery[5]	1,499		
Total		2,405	
Total Expenses			6,520
NET FARM INCOME			2,240
INTEREST ON INVESTMENT			2,386
RETURN TO LABOR AND MANAGEMENT			-146

1. Income from livestock was specified as total sales minus total purchase cost.
2. Tax.
3. Tax depreciation, repair, and insurance.
4. Tax and insurance.
5. Tax, insurance, depreciation, repair, and housing.

the total expense which was the next highest expense item. The remaining expenses were distributed between livestock and miscellaneous expenses which were 15 percent and 8 percent respectively.

Farm Return. Net farm income was $2,240. When $2,386 interest on investment was subtracted from this, a negative $146 resulted for operator's labor and management.

Summary

Table 35 presents various items relevant to the evaluation of the three farm organizations for the 320 acre farm. These items permit a comparison of the operations and their influence on the operator's income.

The general farm returned $851 to the operator's labor and management which was considerable lower than the previously established criterion of $3,843 as adequate income. The return to the operator's labor and management per $100 investment was about midway between that for the livestock farm and for the cash grain farm. The dollars expenses per $100 gross was at a level com-

parable to Farm Management farms.[1] This organization had the advantage of being more diversified and feeding all farm grown feed which tends to reduce the operator's risk and uncertainty with regard to annual income.

Table 35. Investment, income, expenses, and farm income for general, primarily livestock, and primarily cash crop 320 acre farms.

Item	Type of 320 Acre Farm		
	General	Primarily livestock	Primarily cash crop
	$	$	$
Total investment	51,289	58,886	44,706
Gross farm income	11,429	16,637	8,760
Total expenses	7,799	11,162	6,520
Net farm income	3,630	5,475	2,240
Interest on investment	2,779	3,232	2,386
Return to operator's labor and management	851	2,243	-146
Total expense per $100 gross income	68	67	74
Return to operator's labor and mgt. per $100 investment.	1.66	3.81	-.33

1. Data provided by Victor Jacobs, Extension Specialist, Instructor, Kansas State University, indicated 86 farms in Farm Management Association #6 (in the area studied) averaged $69 expenses per $100 gross income from 1955 to 1959. These farms were also divided into low one-fourth, middle half, and high one-fourth with respect to operator's return to labor and management. The low one-fourth group averaged $85 expense, the middle half $68 expense, and the high one-fourth $59 expense per $100 gross farm income.

Ths livestock farm yielded the highest return to the operator's labor and managsment. Managerial sfficiency meaeured in terme of total sxpeneas psr $100 gross incoms was $67, ths lowsst of the three organizations. This is slightly better than the aotual average shown by Farm Managsment Records of thie arsa.[1] The chief disadvantage ie this farm organization requires the highest invsstment, although returns to ths invsstment ars also highset. This farm is rather flexable dus to ite dspendencs on farm producsd roughage. This is bscauee cattle are purchaeed in the fall when the farmer would havs a rather definite knowledge as the quality of roughage available.

The cash crop farm return $-146 to the opsrator for labor and managemsnt. Howsvsr, thie organization might be advantageoue to some farmere bscause it rsquiree the least investment. Aleo, a pereon who cannot devote his full employment to the farm (i. e. - ill health, part time job off farm, etc.) might find this organization eatisfactory sinoe it rsquires about one-half of the operator's svailabls labor.

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1. Data provided by Victor Jaoobs, Extsnsion Spsoialist, Instructor, Kansae State Univsrsity, indicated 86 farme in Farm Managsment Association #6 (in ths arsa studisd) averaged $69 expsnees per $100 groes income from 1955 to 1959. These farms were also dividsd into low ons-fourth, middle half, and high one-fourth with reepect to operator's return to labor and management. The low one-fourth group averaged $85 expsnse, the middle half $68 expense, and the high one-fourth $59 expense psr $100 gross farm income.

THE 480 ACRE FARM

The 480 acre farm was the largest farm analyzed in this study. Some farm organizations approached an adequate return to the operator's labor and management, but always fell short. In some cases the operator used all his available labor, in others, only a portion. If intensive livestock practices were followed on this size farm it provided very close to an adequate living for the operator.

The General Farm

The nature of this farm organization implied that several enterprises are important sources of income. Both cash crops and livestock enterprises were developed on this farm in amounts that might be representative of farms in Southeast Kansas. The important sources of income are wheat, soybeans, deferred steers, and wintered and fattened heifers.

Investment. Fixed capital invested in land, and buildings and livestock equipment was 59 percent of the $75,777 total investment requirement. Working capital comprized the other 41 percent of the total investment. These investments are broken down into their respective catagories and presented in Table 36.

Crops. The number of acres, production, disposition, and return to crops is given in Table 37. The crops on this farm which were raised to feed cattle are corn, milo, sorghum silage,

and alfalfa. Wheat and soybeans were produced for sale as cash crops and returned $3,229.

Table 36. Investment required to operate a 480 acre general farm.

Item	: Investment	
	$	$
Fixed Capital:		
Land	37,536	
Bldgs. and livestock equipment	7,199	
Total Fixed Capital		44,735
Working Capital:		
Livestock	16,225	
Feed	3,903	
Machinery	8,898	
Fertilizer	2,016	
Total Working Capital		31,042
Total Investment		75,777

About 10 percent of the cropland was devoted to alfalfa legume. Assuming a stand lasts four years, and is replanted on ground which has not grown alfalfa for the longest time, each crop acre would receive the soil building benefits of this legume every 40 years.

Cash crop expenses are presented in Table 38. Fertilizer and lime were the largest expense items--50 percent of the $4,037 total expense. Custom work was 23 percent of the total expense because a corn picker, baler and silage cutter were custom hired.

Livestock. The livestock enterprise consisted of 55 deferred steers and 60 heifers for wintering and fattening. The steers

Table 37. Land use, production, crop disposition on 480 acre, general farm.

Land use	Acres	Unit	Production		Crop disposition				
					Farm		Sold		
			Yield	Total	Seed	Feed	Quanity	Price	Return
								$	$
Cropland									
Wheat	55	bu.	28	1540	77		1463	1.75	2560
Corn	80	bu.	34	2720		2720		.95	
Milo	49	bu.	32	1568		1568		.85	
Soybeans	25	bu.	15	375			375	1.75	656
Sorghum (silage)	20	ton	9	180		180		5.50	
Alfalfa	26	ton	2.5	65		65		16.00	
Total Cropland	255								
Pasture	195								
Fmstd., waste, etc.	30								
Total	480								3229

Table 38. Crop expense items for 480 acre, general farm.

Crop	Seed	Fertilizer and lime	Machine operating cost	Custom work hired	Labor hired	Total
	$	$	$	$	$	$
Wheat		488	83		45	616
Corn	110	795	139	320		1364
Milo	39	331	86		51	507
Soybeans	45		47		26	118
Sorghum (silage)	12	135	52	360	163	722
Alfalfa	32	94	40	260	111	537
All Cropland		173				173
Total	238	2016	447	940	396	4037

were bought to utilize the available pasture. Net receipts from these 115 cattle was $13,830 as shown in Table 39. Livestock expenses are discussed in detail in the following income and expense summary.

Table 39. Livestock purchases, sales, and net receipts on the 480 acre, general farm.

Livestock	No. head	Purchased	Sold	Net receipts
		$	$	$
Steers	55	5,143	12,794	7,651
Heifers	60	4,800	10,979	6,179
Total Livestock	115	9,943	23,773	13,830

Labor and Power Requirements. Table 40 presents the labor and power requirements. The operator's labor was devoted to crop production 57 percent of the time. Livestock production occupied

34 psrcsnt and miscellanecus labcr the remaining 10 psrcent. Tctal cperatcr's labcr fcr ths ysar was 2,530 hours cr 84 psrcsnt cf the estimated 3,000 hours availabls. It appeared ths cperatcr wculd have to develcp his enterpriss scmewhat further tc expsnd his sntire labcr rescurce.

Incems and Expenss Summary. The incems and expense summary is prssentsd in Table 41. Eighty-cns percent of the tctal grcss incems cams from livestcck net recsipts. Wheat and scybsan sales brcught ths tctal grcss farm incems tc $17,046.

Tctal expsnses wers $11,011 which were 65 percent cf the grcss income. Ths largest expsnse itsm was cash crcp expsnse which was 37 psrcent cf the tctal expenses. Fixed sxpsnsss wsre one-third cf ths sxpsnsss and livestcck and miscellanscus expenses were 25 percent and 5 psrcent of ths tctal sxpsnses rsspectivsly.

Farm Return. Nst farm incems was $6,045 frcm which $4,099 interest cn invsstment was subtractsd tc give $1,946 rsturn tc cpsratcr's labcr and managsmsnt.

The Primarily Livsstcck Farm

This farm crganizatien was characterized by ths increassd impcrtance cf livsstcck as the principls scurce cf farm incems. Cash crcp returns wers diminished because scybsans wsre eliminated frcm the crcp sequence, leaving only wheat for cash crcp incems.

Table 40. Labor and power requirements on 480 acre, general farm.

Item	No. units	Total hours for crops and livestock			
		Operators labor	Hired labor	Total labor	Power[1]
		(Hours)	(Hours)	(Hours)	(Hours)
Crops	(Acres)				
Wheat	55	229	39	268	240
Corn	80	519		519	471
Milo	49	270	44	314	281
Soybeans	25	142	23	165	148
Sorghum (silage)	20	144	142	286	176
Alfalfa	26	126	96	222	131
Total	255	1430	344	1774	1447
Livestock	(Head)				
Steers	55	468		468	275
Heifers	60	402		402	270
Total	115	870		870	545
Misc. labor		230		230	
Total crops and livestock		2530	344	2874	1992

1. Includes truck and tractor hours.

Table 41. Income and expense summary for 480 acre, general farm.

	$	$	$
INCOME			
Steers[1]	7,651		
Heifers[1]	6,179		
Wheat	2,560		
Soybeans	656		
Gross farm income			17,046
EXPENSES			
Cash Livestock Expenses:			
Vet. fees and medicine	230		
Feed bought	1,830		
Machine operating cost	150		
Marketing cost	528		
Total		2,738	
Cash Crop Expenses:			
Seed	238		
Fertilizer and lime	2,016		
Machine operating cost	447		
Custom work hired	940		
Labor hired	396		
Total		4,037	
Cash Miscellaneous Expense:			
Auto, farm share	280		
Utilities	160		
Farm dues and fees	140		
Total		580	
Fixed Expense:			
Land[2]	529		
Bldgs. and livestock equipment[3]	749		
Livestock[4]	203		
Feed[2]	6		
Machinery[5]	2,159		
Total		3,646	
Total Expenses			11,011
NET FARM INCOME			6,045
INTEREST ON INVESTMENT			4,099
RETURN TO LABOR AND MANAGEMENT			1,946

1. Income from livestock was specified as total sales minus total purchase cost.
2. Tax.
3. Tax depreciation, repair, and insurance.
4. Tax and insurance.
5. Tax, insurance, depreciation, repair, and housing.

Investment. Investments for various items are presented in Table 42. The total investment of $84,997 was distributed between fixed capital and working capital which were 53 percent and 47 percent of the total investment respectively.

Table 42. Investment required to operate a 480 acre, primarily livestock farm.

Item	Investment	
	$	$
Fixed Capital:		
Land	37,536	
Bldgs. and livestock equipment	7,539	
Total Fixed Capital		45,075
Working Capital:		
Livestock	22,957	
Feed	5,929	
Machinery	8,898	
Fertilizer	2,138	
Total Working Capital		39,922
Total Investment		84,997

Crops. Soybeans were deleted from the cropping system and this acreage planted to additional sorghum silage and alfalfa for cattle feed. Wheat, corn, and milo acreages were the same as those on the general farm. Land use, production, and disposition of crops are presented in Table 43. The only cash crop, wheat returned $2,560 from sales.

Alfalfa was established on 16 percent of the land. If it was rotated every four years over all cropland, alfalfa legume would be raised on each acre of cropland every 25 years.

Table 43. Land use, production, crop disposition on 480 acre, primarily livestock farm.

Land use	Acres	Unit	Production		Crop disposition				
					Farm		Sold		
			Yield	Total	Seed	Feed	Quanity	Price	Return
								$	$
Cropland									
Wheat	55	bu.	28	1540	77		1463	1.75	2560
Corn	80	bu.	34	2720		2720		.95	
Milo	49	bu.	32	1568		1568		.85	
Sorghum (silage)	30	ton	9	270		270		5.50	
Alfalfa	41	ton	2.5	102.5		102.5		16.00	
Total Cropland	255								
Pasture	195								
Fmstd., waste, etc.	30								
Total	480								2560

Cash crop expense items are presented in Table 44. Fertilizer and lime constituted 47 percent of the total expense. Custom work hired was 28 percent of the expenses, which is somewhat more than was found on the general farm. Expenses for baling alfalfa hay and cutting sorghum silage account for 75 percent of the custom work expense.

Table 44. Crop expense items for 480 acre, primarily livestock farm.

Crop	Seed	Fertilizer and lime	Machine operating cost	Custom work hired	Labor hired	Total
	$	$	$	$	$	$
Wheat		488	83		45	616
Corn	110	795	139	320		1364
Milo	39	331	86		51	507
Sorghum (silage)	18	203	78	540	245	1084
Alfalfa	51	148	64	410	173	846
All cropland		173				173
Total	218	2138	450	1270	514	4590

Livestock. Since livestock was emphasized in this organization, 183 head of cattle were carried in systems of deferred fed steers and wintered and fattened heifers. Fifty-five steers were handled to use the available pasture. Since the roughage had been increased, 128 heifers were purchased to utilize all roughage produced on the farm that was not consumed by the steers.

The feed grain acreage was not increased, so 2,100 bushels of milo were purchased for $1,785 to provide adequate grain for the total ration requirement. Purchased milo was assumed to be

hauled by a custom trucker for an additional expense of $105.

Livestock purchases, sales, and net receipts are presented in Table 45. The total net receipts from livestock were $20,834 of which steers and heifers contributed 37 percent and 63 percent of the total respectively. Livestock expenses not previously discussed are treated in the income and expense summary which follows.

Table 45. Livestock purchases, sales, and net receipts on the 480 acre, primarily livestock farm.

Livestock	No. head	Purchased	Sold	Net receipts
		$	$	$
Steers	55	5,143	12,794	7,651
Heifers	128	10,240	23,423	13,183
Total Livestock	183	15,383	36,217	20,834

Labor and Power Requirements. Requirements for labor and power are presented in Table 46. The operator's labor was about equally distributed between livestock and crop production. Forty-three percent of his time was devoted to the former and 47 percent to the latter. Miscellaneous labor accounted for the other 10 percent.

The operator's total labor for the year was 3,032 or 101 percent of his assumed 3,000 hours available. Although the operator's labor total was 32 hours above the established maximum limit of 3,000 hours, it was thought he could handle this extra

Table 46. Labor and power requirements on 480 acre, primarily livestock farm.

Item	No. units	Total hours for crops and livestock: Operators labor	Hired labor	Total labor	Power[1]
		(Hours)	(Hours)	(Hours)	(Hours)
Crops	(Acres)				
Wheat	55	229	39	268	240
Corn	80	519		519	471
Milo	49	270	44	314	281
Sorghum (silage)	30	217	213	430	265
Alfalfa	41	195	151	346	207
Total	255	1430	447	1877	1464
Livestock	(Head)				
Steers	55	468		468	275
Heifers	128	858		858	576
Total	183	1326		1326	851
Misc. labor		276		276	
Total crops and livestock		3032	447	3479	2315

1. Includes truck and tractor hours.

work since it amounted to only 6.4 minutes per day over the 300 work day year. Therefore, this organization fully utilized the labor resources available on the farm.

Income and Expense Summary. The summary of income and expenses for this farm is given in Table 47. Livestock net receipts accounted for 89 percent of the gross farm income. Returns from wheat sold brought the total gross farm income to $23,394. Sixty-four percent of the gross farm income was distributed among the various expense items. The largest catagory, cash livestock expenses, were 40 percent of the total expenses. Cash crop expenses were 31 percent of the total. Fixed expenses were 25 percent and miscellaneous expenses 3 percent of the $15,015 total expenses.

Farm Return. The net farm income resulting in the above summary is $8,379 of which $4,649 was credited to interest on investment. The operator's return to labor and management was $3,730.

The Primarily Cash Crop Farm

Special emphasis in this farm organization was placed on the production of cash crops. Wheat, corn, and soybeans sales were a substantial part of the farm income. Deferred fed steers were the only source of income from livestock.

Investment. The total investment required to operate this farm organization was $67,635. Sixty-six percent of this was

Table 47. Income and expense summary for 480 acre, primarily livestock farm.

	$	$	$
INCOME			
Steers[1]	7,651		
Heifers[1]	13,183		
Wheat	2,560		
Gross farm income			23,394
EXPENSES			
Cash Livestock Expenses:			
Vet. fees and medicine	366		
Feed bought	4,624		
Feed grain hauled	105		
Machine operating cost	235		
Marketing cost	811		
Total		6,141	
Cash Crop Expenses:			
Seed	218		
Fertilizer and lime	2,138		
Machine operating cost	450		
Custom work hired	1,270		
Labor hired	514		
Total		4,590	
Cash Miscellaneous Expenses:			
Auto, farm share	280		
Utilities	160		
Farm dues and fees	140		
Total		580	
Fixed Expenses:			
Land[2]	529		
Bldgs. and livestock equipment[3]	785		
Livestock[4]	312		
Feed[2]	9		
Machinery[5]	2,159		
Total		3,794	
Total Expenses			15,015
NET FARM INCOME			8,379
INTEREST ON INVESTMENT			4,649
RETURN TO LABOR AND MANAGEMENT			3,730

1. Income from livestock was specified as total sales minus total purchase cost.
2. Tax.
3. Tax depreciation, repair, and insurance.
4. Tax and insurance.
5. Tax, insurance, depreciation, repair, and housing.

involved in fixed capital and the remainder in fixed capital. These two categories of investment were divided into separate items and presented in Table 48.

Table 48. Investment required to operate a 480 acre, primarily cash crop farm.

Item	: Investment	
	$	$
Fixed Capital:		
Land	37,536	
Bldgs. and livestock equipment	6,899	
Total Fixed Capital		44,435
Working Capital:		
Livestock	10,285	
Feed	2,115	
Machinery	8,898	
Fertilizer	1,902	
Total Working Capital		23,200
Total Investment		67,635

Crops. The same acreage of wheat, milo, and corn was retained on this farm, but the acreage of soybeans was raised to 46. Cropland acreage in alfalfa and sorghum silage was reduced to a minimum and which would still provide sufficient roughage for the deferred fed steers. All corn not fed to livestock, wheat, and soybeans were sold as cash crops. Table 49 shows the land use, production, disposition and return from cash crop sales.

Crop expenses separated into categories which are presented in Table 50. Fertilizer and lime expense accounted for 53 percent of the crop expenses. Eighteen percent of the total crop expense was custom work hired of which one-half was for baling

Table 49. Land use, production, crop disposition on 480 acre, primarily cash crop farm.

Land use	Acres	Unit	Production		Crop disposition				
					Farm		Sold		
			Yield	Total	Seed	Feed	Quanity	Price	Return
								$	$
Cropland									
Wheat	55	bu.	28	1540	77		1463	1.75	2560
Corn	80	bu.	34	2720		875	1845	.95	1752
Milo	49	bu.	32	1568		1568		.85	
Soybeans	47	bu.	15	705			705	1.75	1234
Sorghum (silage)	9	ton	9	81		81		5.50	
Alfalfa	16	ton	2.5	37.5		37.5		16.00	
Total Cropland	255								
Pasture	195								
Fmstd., waste, etc.	30								
Total	480								5546

alfalfa and cutting sorghum silage.

Table 50. Crop expense items for 480 acre, primarily cash crop farm.

Crop	Seed	Fertilizer and lime	Machine operating cost	Custom work hired	Labor hired	Total
	$	$	$	$	$	$
Wheat		488	83		45	616
Corn	110	795	139	320		1364
Milo	39	331	86		51	507
Soybeans	85		88		48	221
Sorghum (silage)	53	61	23	162	74	373
Alfalfa	19	54	23	150	64	310
All cropland		173				173
Total	306	1902	442	632	282	3564

Livestock. The only livestock on this farm were 55 deferred steers bought to utilize the available pasture. The steers did not consume all the feed grain produced on the farm. All milo was fed, but about two-thirds (1845 bushels) of the corn was sold for cash. All alfalfa and roughage produced on the farm was fed to the steers.

The total sales for the 55 steers was $12,794. They were purchased for $5,143 which left $7,651 net receipts. Livestock expenses are enumerated in the income and expense summary which follows.

Labor and Power Requirements. Table 51 presents the labor and power requirements for this farm. Sixty-eight percent of the operator's labor was devoted to the production of farm crops.

Livestock occupied another 22 percent and miscellaneous labor the remaining 10 percent. The operator spent a total of 2,080 hours working on the farm. This was only 69 percent of the 3,000 hours available annual labor.

Income and Expense Summary. The income and expense summary for this farm is presented in Table 52. Forty-two percent of the gross farm income came from the sale of cash crops. Other income was net receipt from deferred steers which gave $13,197 total gross farm income.

Total expenses amounted to $9,062 which was 69 percent of the gross income. The largest expense category was cash crop expense which accounted for 40 percent of the total expenses. Fixed expenses were 39 percent, livestock 15 percent, and miscellaneous expense 6 percent of the total expenses.

Farm Return. Net farm income was $4,135. When $3,614 interest on investment was subtracted from this, $521 remained as return to operator's labor and management.

Summary

Various items relevant to the evaluation of these three farm organizations for the 480 acre farm are presented in Table 53. These items permit a comparison of the alternative organizations and their influence on the operator's income.

The general farm returned $1,946 to the operator's labor and management which was about one-half the return from the

Table 51. Labor and power requirements on 480 acre, primarily cash crop farm.

Item	No. units	Total hours for crops and livestock: Operators labor	Hired labor	Total labor	Power[1]
		(Hours)	(Hours)	(Hours)	(Hours)
Crops	(Acres)				
Wheat	55	229	39	268	240
Corn	80	519		519	471
Milo	49	270	44	314	281
Soybeans	47	269	42	311	279
Sorghum (silage)	9	65	64	129	80
Alfalfa	15	71	56	127	76
Total	255	1423	245	1668	1427
Livestock	(Head)				
Steers	55	468		468	375
Total	55	468		468	375
Misc. labor		189		189	
Total crops and livestock		2080	245	2325	1802

1. Includes truck and tractor hours.

Table 52. Income and expense summary for 480 acre, primarily cash crop farm.

	$	$	$
INCOME			
Steers[1]	7,651		
Wheat	2,560		
Soybeans	1,234		
Corn	1,752		
Gross farm income			13,197
EXPENSES			
Cash Livestock			
Vet. fees and medicine	110		
Feed bought	938		
Machine operating cost	76		
Marketing cost	278		
Total		1,402	
Cash Crop Expenses:			
Seed	306		
Fertilizer and lime	1,902		
Machine operating cost	442		
Custom work hired	632		
Labor hired	282		
Total		3,564	
Caeh Miscellaneous Expensee:			
Auto, farm share	280		
Utilities	160		
Farm dues and feee	140		
Total		580	
Fixed Expenses:			
Land[2]	529		
Bldgs. and livestock equipment[3]	718		
Livestock[4]	107		
Feed[2]	3		
Machinery[5]	2,159		
Total		3,516	
Total Expenses			9,062
NET FARM INCOME			4,135
INTEREST ON INVESTMENT			3,614
RETURN TO LABOR AND MANAGEMENT			521

1. Income from livestock was specified as total ealee minus total purchaee coet.
2. Tax.
3. Tax depreciation, repair, and housing.
4. Tax and insurance.
5. Tax, insurance, depreciation, repair, and housing.

livestock farm, but over three times greater than the return from the cash orop farm. Although thie farm did not give the highest return to the operator, it had the advantagee of being somewhat more diversified than the other organizations and feeding only farm grown grain and roughage to livestook. Theee characteristics tended to reduce the operator's risk and uncertainty with regard to annual inoome.

As hae been previouely noted on the 320 acre farm, the livestock farm yielded the higheet return to the operator's labor and management. This return of $3,730 came the closest of all organizations on both eize farms to the $3,843 which was established as an adequate income. For all practioal purposes, this farm organization would provide adequate income to a good farm manager. Sixty-four dollars expense per $100 grose income indicate it utilized resources efficiently. Even though it had a disadvantage of higher investment than the other organizations, this organization returned $4.39 per $100 inveetment, more than any other farm.

It wae evident that the primarily cash crop farm was the least profitable. Not only did thie organization return less to the operator'e labor and management, it did not fully employ the operator's labor throughout the year. When measured in terms of expense per $100 gross income, this farm approached the efficiency of aotual farms in Southeast Kansas even though the expense per $100 grose income was higher than the other two organi-

zations.[1] Certain conclusions made this farm notable. Since it required less labor, it might prove satisfactory for a farm operator who can not devote his full time to the farm operation.

Table 53. Investment, income, expenses, and farm income for general, primarily livestock, and primarily cash crop 480 acre farms.

Item	Type of 480 Acre Farm		
	General	Primarily Livestock	Primarily Cash Crop
	$	$	$
Investment	75,777	84,997	67,635
Gross farm income	17,046	23,394	13,197
Expenses	11,011	15,015	9,062
Net farm income	6,045	8,379	4,135
Interest on investment	4,099	4,649	3,614
Return to operator's labor and management	1,946	3,730	521
Total expense per $100 gross income	65	64	69
Return to operator's labor and mgt. per $100 investment	2.57	4.39	.77

SUMMARY AND CONCLUSIONS

In the first part of this study the problem was stated that "incomes on many farms in Southeastern Kansas were too low". Among the responsible factors for the low income were:

1. See footnote (1) p. 86.

a. Farm acreages too small, and

b. Improper organization of farm enterprises (too many and too small enterprises, and not the proper combination of enterprises).

The objectives of this thesis were to:

a. Select farm sizes of adequate acreage and

b. Develop farm organizations for these acreages.

The budget was employed as the tool of analysis for this study. Considerable effort and detail were involved in the development of the farm budgets. Anderson County was selected as a representative of southeastern Kansas to facilitate the development of standards.

Income, expense, and returns of the various farm organizations are presented in Table 54. As would be expected, the returns for the 480 acre farms were largest. The primarily livestock farm returns for both 320 and 480 acre farms were the largest in their respective size groups, and the cash crop farms returned the least.

The general hypothesis was that farm organizations for 320 and 480 acre farms in southeastern Kansas could be developed that would return a favorable income. The measure of favorable income was in terms of the operator's return to labor and management. The labor and management return for the 480 acre livestock farm was $3,730. This is close to the $3,843 which was set forth as an adequate income. For all practical purposes, the statement can be made that in testing the hypothesis only one farm organization,

Table 54. Farm organization incomes, expenses and returns for 320 and 480 acre farms.

Item	Unit	320 Acre Farm			480 Acre Farm		
		General	Primarily Livestock	Primarily Cash Crop	General	Primarily Livestock	Primarily Cash Crop
Crops							
Wheat	acres	30	30	30	55	55	55
Corn	acres	55	55	55	80	80	80
Milo	acres	33	33	33	49	49	49
Soybeans	acres	20		30	25		47
Sorghum (silage)	acres	12	22	6	20	30	9
Alfalfa	acres	20	30	10	26	41	15
Pasture	acres	130	130	130	195	195	195
Livestock							
Deferred steers	head	37	37	37	55	55	55
Winter, fatten heifers	head	42	98	0	60	128	0
Total investment	dol.	51,289	58,886	44,706	75,777	84,997	67,635
Gross farm income	dol.	11,429	16,637	8,760	17,046	23,394	13,197
Total expenses	dol.	7,799	11,162	6,520	11,011	15,015	9,062
Net farm income	dol.	3,630	5,475	2,240	6,045	8,379	4,135
Interest on investment	dol.	2,779	3,232	2,286	4,099	4,649	3,614
Return to operator's labor and mgt.	dol.	851	2,243	-146	1,946	3,730	521
Total expense per $100 gross income	dol.	68	67	74	65	64	69
Return to operator's labor and mgt. per $100 investment	dol.	1.66	3.81	-.33	2.57	4.39	.77

ths 480 acrs livsstock farm eubstantiated the hypothesis. Ths other five farm organizations did not prove the hypothsis.

According to economic theory,

> Equilibrium msans a state of rsst--ths attainment of a poeition from which thers is no incentive to move. A consumer is in equilibrium whsn his sxpenditures on diffsrsnt goods and ssrvices yield maximum eatisfaction. No move on hie part can inoreass his satisfaction but, rather, will decreass it. Similarly, a bueinsss firm ie in equilibrium when its rssource purchasse and its output ars euch that it maximizes ite profits, if profit maximization is its objectivs. Any changs on its part will cause profite to decrsaes. A reeource owner is in equilibrium whsn ths rssourcee which he owns ars placsd in thsir highsst paying smployments and the income of the rssourcs ownsr is maximized. Any transfers of reeource unite from one employmsnt to another will cause his income to dscrease.[1]

Thue for the 320 acrs farm, ths livestock farm appeared to be more in equilibrium than ths othsr two organizatione, and likewiee for the 480 acrs farm, the liveetock farm appeared to be more in equilibrium. It ie true, the liveetock farme in both the 320 and 480 aors farms had to buy off farm rseources in the form of fsed. However, by purchasing this feed, greater rsturns to the othsr reeources and to the farm wsrs possible.

These farm organizatione which havs bssn developed in thie study havs dirsct practical application. It was ths intsntion of thie theeie that the matsrial which has bssn developed will be used by sxteneion farm managsment personnel and othsr workers in farm planning to aesist in this kind of work.

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1. Richard H. Lsftwich, Ths Price System and Rssourcs Allocation, p. 351.

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APPENDIX

Tabls 55. Cost of lims per ton, by counties, Typs-of-Farming Arsas 1 and 2.

Item	A.S.C. payment psr acre[1]	Total cost psr acre[2]	Farmsrs nst cost per acre[2]
	$	$	
Typs-of-Farming Area 1			
Cherokee	2.55	3.64	1.09
Crawford	2.38	3.40	1.02
Labetts	2.38	3.40	1.02
Montgomery	2.52	3.60	1.08
Neosho	2.38	3.40	1.02
Wilson	2.38	3.40	1.02
Type-of-Farming Arsa 2			
Allen	2.30	3.29	.99
Anderson	2.34	3.34	1.00
Bourban	2.45	3.50	1.05
Coffey	2.55	3.64	1.09
Franklin	2.10	3.00	.90
Linn	2.25	3.21	.96
Miami	2.10	3.00	.90
Osage	2.40	3.43	1.03
Woodson	2.45	3.50	1.05
Total	35.53	50.75	15.22
Avg. for Type-of-Farming Areas 1 and 2	2.37	3.38	1.01

1. Obtainsd from ths Rilsy County A.S.C. Office, Manhattan, Kansas. Price is for minimum application of 2 tons psr acre. To qualify for paymsnt, lime must be applisd prior to establishing grassss or legumss.

2. Calculatsd on basis of A.S.C. payments sst at 70 percsnt of total cost.

Table 56. Typical operations, date, amount of power, labor and fuel for wheat, Anderson County, Kansas, 1950.[1]

Operation	Typical machine	Typical date	Average per acre[2]			
			Hours of power		Hours of labor	Gallons of fuel
			Tractor	Truck		
Plow	2-14" mld.	July 25	1.24		1.25	2.14
Disc, 1st time	7' tandem	Aug. 30	.42		.42	.78
Disc, 2nd time	7' tandem	Sept. 30	.42		.42	.78
Harrow	3 sections	Oct. 4	.22		.22	.33
Drill, fertilize	16 hole	Oct. 8	.31		.31	.51
Total pre-harvest			2.61		2.62	4.54
Combine	5' pull	June 28	.68		.76	1.18
Haul[3]	½ ton truck	June 28		.68	.68	.37
Total harvest, with combine			.68	.68	1.44	1.55
Total harvest, without combine			.00	.68	.68	.37
Total, with combine			3.29	.68	4.06	6.09
Total, without combine			2.61	.68	3.30	4.91

1. Dale A. Knight. Practices and Requirements for the Production of Farm Crops, Anderson County, Kansas. Kansas Agricultural Experiment Station, Agricultural Economics Report 65. Table 8, p. 16.
2. Requirements are for time equipment was actually in the field.
3. One man hauled while the combine was operating.

Table 57. Typical operations, date, amount of power, labor and fuel for corn, Anderson County, Kansas, 1950.[1]

Operation	Typical machine	Typical date	Average per acre[2]			
			Hours of power		Hours of labor	Gallons of fuel
			Tractor	Truck		
Plow[3]	2-14" mld.	March 12	1.24		1.25	2.14
Disc, 1st time	7' tandem	April 17	.42		.42	.78
Disc, 2nd time	7' tandem	April 22	.42		.42	.78
Plant, fertilize	2 row	April 30	.44		.49	.80
Cultivate, 1st time	2 row	May 21	.59		.59	.77
Cultivate, 2nd time	2 row	June 11	.51		.51	.51
Cultivate, 3rd time	2 row	June 27	.46		.46	.63
Total preharvest			4.08		4.14	6.61
Pick with machine	1 row	Oct. 30	1.27		1.33	1.69
Haul	tractor and trailer	Oct. 30	1.27		1.27	.43
Total harvest, with picker			2.43		2.43	2.12
Total harvest, without picker			1.27		1.27	.43
Total, with picker			6.62		6.74	8.73
Total, without picker			5.35		5.41	7.04

1. Ibid., Table 10, p. 18.
2. Requirements are for time equipment was actually in the field.
3. Half plowed in Fall, half plowed in Spring.

Table 58. Typical operations, date, amount of power, labor and fuel for grain sorghum, Anderson County, Kansas, 1950.[1]

Operation	Typical machine	Typical date	Average per acre[2]			
			Hours of power		Hours of labor	Gallons of fuel
			Tractor	Truck		
Plow	2-14" mld.	March 28	1.24		1.25	2.14
Disc	7' tandem	May 7	.42		.42	.78
Plant, fertilize	2 row	May 12	.48		.56	.56
Cultivate, 1st	2 row	June 6	.50		.50	.73
Cultivate, 2nd	2 row	June 22	.40		.40	.66
Cultivate, 3rd	2 row	July 12	.35		.35	.51
Total preharvest			3.39		3.48	5.38
Combine	5'	Sept. 15	.91		.94	1.42
Haul	1½ T. truck	Sept. 15		.91	.91	.28
Total harvest, with combine			.91	.91	1.85	1.70
Total harvest, without combine			.00	.91		
Total, with combine			4.30	.91	5.33	7.08
Total, without combine			3.39	.91	4.39	5.66

1. Ibid., Table 14, p. 22.
2. Requirements are for time equipment was actually in the field.

Table 59. Typical operations, date, amount of power, labor, and fuel for soybeans, Anderson County, Kansas, 1950.[1]

Operation	Typical machine	Typical date	Average per acre[2]			
			Hours of power		Hours of labor	Gallons of fuel
			Tractor	Truck		
Plow	2-14" mld.	April 10	1.24		1.25	2.14
Disc, 1st	7' tandem	May 10	.42		.42	.78
Disc, 2nd	7' tandem	May 25	.42		.42	.78
Plant, fertilize	2 row	June 1	.51		.56	.67
Cultivate, 1st	2 row	June 18	.48		.51	.73
Cultivate, 2nd	2 row	July 1	.46		.48	.69
Total preharvest			3.53		3.64	5.79
Combine	5'	Oct. 15	.93		.94	1.42
Haul	1½ T. truck	Oct. 15		.93	.94	.37
Total harvest, with combine			.93	.93	1.87	1.79
Total harvest, without combine			.00	.93	.93	.37
Total, with combine			4.46	.93	5.51	7.58
Total, without combine			3.53	.93	4.57	6.16

1. Ibid., Table 10, p. 18.
2. Requirements are for time equipment was actually in the field.

Table 60. Typical operations, date, amount of power, labor and fuel for sorghum for silage, Anderson County, Kansas, 1950.[1]

Operation	Typical machine	Typical date	Average per acre[2] Hours of power: Tractor	Truck	Hours of labor	Gallons of fuel
Plow	2-14" mld.	April 20	1.24		1.25	2.14
Disc, 1st	7' tandem	May 10	.42		.42	.78
Disc, 2nd	7' tandem	May 19	.42		.42	.78
Plant, fertilize	2 row	May 22	.50		.50	.59
Cultivate, 1st	2 row	June 12	.50		.50	.73
Cultivate, 2nd	2 row	June 26	.40		.40	.66
Total preharvest			3.48		3.49	5.68
Cut with field cutter		Oct. 1	1.43		1.43	2.85
Haul to silo		Oct. 1	3.11		5.35	2.60
Blower		Oct. 1	1.43		1.43	2.17
Tramp		Oct. 1			1.66	
Total harvest, with cutter			5.97		9.87	7.62
Total harvest, without cutter			4.54		8.44	4.77
Total, with cutter			9.45		13.36	13.30
Total, without cutter			8.02		11.93	10.45

1. Ibid., Table 28, pp. 36, 37.
2. Requirements are for time equipment was actually in the field.

Table 61. Typical operations, date, amount of power, labor, and fuel for establishing a stand of alfalfa, Anderson County, Kansas, 1950.[1]

Operation[3]	Typical machine	Typical date	Average per acre[2]			
			Hours of power		Hours of labor	Gallons of fuel
			Tractor	Truck		
Plow	2-14" mld.	July 13	1.24		1.25	2.14
Disc, 1st	7' tandem	July 20	.42		.42	.78
Disc, 2nd	7' tandem	July 27	.42		.42	.78
Disc, 3rd	7' tandem	August 5	.42		.42	.78
Disc, 4th	7' tandem	August 12	.42		.42	.78
Harrow, 1st	3 section	August 19	.22		.22	.33
Harrow, 2nd	3 section	August 26	.22		.22	.33
Cultipack	8'	August 30	.34		.34	.50
Drill, fertilize[4]	16 hole	Sept. 1	.35		.35	.53
Cultipack	8'	Sept. 2	.34		.34	.50
Total			4.39		4.40	7.45

1. Ibid., Table 18, p. 26.
2. Requirements are for time equipment was actually in the field.
3. The number and date of operations are conditioned by the weather in a particular year.
4. Substituted 16 hole for 12 hole drill. Replacement requirements taken from Ibid., Table 30, p. 44.

Table 62. Typical operations, date, amount of power, labor and fuel for alfalfa harvest, Anderson County, Kansas, 1950.[1]

Operation	Typical machine	Typical date	Average per acre[2] Hours of power: Tractor	Hours of power: Truck	Hours of labor	Gallons of fuel
First cut						
Mow	7'	June 1	.36		.40	.48
Rake	Side del.	June 2	.35		.35	.42
Bale	Pickup	June 3	.41		.82	.80
Baler engine						.40
Haul	1½ T. Truck	June 3		.45	1.26	.57
Total first cut, with baler			1.12	.45	2.83	2.67
Total first cut, without baler			.71	.45	2.01	1.47
Second cut						
Mow	7'	July 14	.36		.40	.48
Rake	Side del.	July 15	.35		.35	.42
Bale	Pickup	July 16	.41		.82	.80
Baler engine						.40
Haul	1½ T. Truck	July 16		.45	1.26	.57
Total second cut, with baler			1.12	.45	2.83	2.67
Total second cut, without baler			.71	.45	2.01	1.47

Continued on next page.

1. Ibid., Table 20, p. 28.
2. Requirements are for time equipment was actually in the field.

Table 62. (cont.)

Operation	Typical machine	Typical date	Average per acre: Hours of power: Tractor	Hours of power: Truck	Hours of labor	Gallons of fuel
Third cut						
Mow	7'	Sept. 5	.36		.40	.48
Rake	Side del.	Sept. 6	.35		.35	.42
Bale	Pickup	Sept. 7	.41		.82	.80
Baler engine						.40
Haul	1½ T. truck	Sept. 7		.45	1.26	.57
Total third cut, with baler			1.12	.45	2.83	2.67
Total third cut, without baler			.71	.45	2.01	1.47
Total, with baler			3.36	1.35	8.49	8.01
Total, without baler			2.13	1.35	6.03	4.41

Table 63. Assessed and full valuation of farm lands and improvements, taxes, and tax rates thereon.

Type-of-Farming Area and County	1959 Assessed Value[1]	1958 Ratio	Calculated Full Value	1959 tax[1]	Mill Levy	Rate per $100 Full Value
	Dollars	%	Dollars	Dollars	Mills	Dollars
Type-of-Farming Area 1						
Cherokee	11,253,410	25	45,013,640	641,539.86	57.01	1.425
Crawford	9,097,190	31	29,345,774	449,345.43	49.39	1.531
Labette	9,479,500	27	35,109,259	547,092.20	57.71	1.558
Montgomery	11,822,105	21	56,295,738	607,527.01	51.39	1.079
Neosho	9,750,695	37	26,353,229	491,249.36	50.38	1.864
Wilson	10,109,235	26	38,881,673	526,506.47	52.08	1.354
Type-of-Farming Area 2						
Allen	9,475,680	27	35,095,111	418,580.94	44.17	1.192
Anderson	8,442,235	24	35,175,979	372,295.03	44.10	1.058
Bourbon	9,352,296	41	22,810,478	446,408.03	47.73	1.957
Coffey	9,980,210	33	30,243,060	442,162.02	44.30	1.462
Franklin	12,740,965	27	47,188,759	542,628.81	42.59	1.149
Linn	9,999,845	44	22,726,920	453,856.44	45.39	1.997
Miami	11,971,215	30	39,904,050	573,030.04	47.87	1.436
Osage	12,243,995	34	36,011,750	596,764.07	48.74	1.657
Woodson	5,774,040	26	22,207,846	244,635.55	42.37	1.102
All Counties	151,492,616	453	522,363,266	7,353,351.26	725.22	21.821
Weighted Average	10,099,507	2900	34,824,217	490,223.42	48.54	1.41

1. Kansas Property Valuation Department, Real Estate Assessment Ratio Study 1958.
2. Information provided by Kansas State Property Valuation Department, Topeka, Kansas, July 19, 1959. From 1959 tax rolls.

Table 64. Farm equipment and machinery investment and cost to own.[1]

Machine	Size	Life	1959 Average Price	Annual Cost to Own, % of Orig. Cost[2]	Annual Cost to own[2]	Avg. Invest.[3]
		(Years)	($)	(%)	($)	($)
Blower, ensilage	15-25 hp	12	830	12.25	102	457
Combine, PTO	6 ft	10	2130	14.25	304	1172
Corn picker, Mtd.	2 row	10	2500	14.25	356	1375
Cultivator, Mtd.	2 row	16	370	11.38	42	204
Feed grinder, burr	10" with elevator	16	146	10.88	16	80
Forage harvester, PTO	1 row	10	1930	16.25	314	1062
Gas barrel	300 gal.	20	100	7.75	8	55
Grain drill, fert. attch.	16 x 7	18	845	8.75	74	465
Hay baler, automatic	twine tie	10	1750	14.25	249	963
Hay rake, side deliv.	4 bar	16	500	9.88	49	275
Harrow, disc, tandem	7 ft.	18	490	10.88	53	270
Harrow, drag	15 ft.	20	150	7.75	12	84
Lister, trailed, fert. attch.	2 row	16	335	12.88	43	184
Manure spreader	70 bu.	18	505	8.75	44	278
Misc. tools and equip.		16	500	9.88	49	275
Mower, tractor	7'	18	385	10.75	41	212
Plow, mlbd., mtd.	2-14"	16	280	14.88	42	154
Tractor	2 plow	10	2415	14.75	356	1328
Tractor	3 plow	10	3540	14.75	509	1898
Trailer	4 wheel	14	500	10.18	51	275
Truck, pick up	½ ton	10	2240	16.25	364	1232

1. Source: G. H. Larson, G. E. Fairbanks, and F. C. Fenton, What It Costs to Use Farm Machinery, Kansas Agricultural Experiment Station Bulletin 417.

2. Estimate includes annual costs for depreciation, repairs, housing, tax, and insurance.

3. Average investment is 55 percent of the 1959 average price to allow for 10 percent salvage value.

SUGGESTED ORGANIZATIONS FOR BEEF-WHEAT 320 ACRE AND 480 ACRE FARMS IN SOUTHEASTERN KANSAS

by

DAVID BROCK COOL

B. S., Kansas State University, 1959

AN ABSTRACT OF A THESIS

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This study was concerned with budgeting 320 and 480 acre farms in southeastern Kansas in an attempt to determine the relative income producing possibilities of alternative beef-wheat farm organizations. The problem was that financial returns from farming on many farms in this area have been too low. Although there were many causes for low farm income, this study concerned itself only with too small acreages and improper organization of enterprises. The objectives of this study were to offer concrete suggestions for use in the next three to five years time period concerning adequate farm size and proper farm organization which might help remedy the above problem.

Farm labor limited to that provided by the operator and some additional hired labor, few off farm resources, and the trend of farm size in southeast Kansas were bases for selecting 320 and 480 acre size farms for study. Each size farm was first adapted to a general farm organization which produced wheat and soybeans for cash crops and livestock in amounts thought to be representative of the area studied. Deferred steer and wintered and fattened heifers were of sufficient number to utilize all roughage and feed grain produced on the farm. Second, a primarily livestock farm was developed with increased livestock numbers. More roughage was produced and soybeans were deleted from the cropping system. Corn was purchased for livestock feed in addition to the feed grain produced on the farm. Third, a primarily cash crop was developed which produced wheat, soybeans, and corn not fed to livestock for cash crops. Enough deferred steers were carried to utilize the available pasture. Roughage production was de-

creaeed to eupply adequate cattle ration requirements and eoybean acreage increased the eame amount.

The budget wae employed as the tool of analyeis for this etudy. Considerable effort and detail were involved in the development of the budget standards. Andereon County was selected ae repreeentative of eoutheastern Kansae to facilitate the development of etandarde.

Income, expenee, and returns of the varioue farm organizatione are presented in Table 1. The general hypothesie was that farm organizations for 320 and 480 aore farme in eoutheestern Kansas ooald be developed that would return a favorable inoome in terme of the operator'e return to labor and management. As would be expected, the returne for the 480 aore farms were largest. The primarily liveetock farm returns for both 320 and 480 aore farme were largest in their respeotive eize groups, and the cash orop farms returned the least.

The labor and management return for the 480 acre livestook farm wae $3,731 whioh wae close to the $3,843 set forth as an adequate inoome. For all praotical purposee, the statement can be made that in testing the hypothesis only one farm organization, the 480 aore liveetock farm, eubetantiated the hypothesis. The other five farm organizatione did not prove the hypotheeie.

These farm organizatione which have been developed in thie study have direct practical application. It wae the intention of this theeis that the material which has been developed will be ueed by extension farm management personnel and other workers in farm planning to aseiet in their kind of work.

Table 1. Farm organization incomes, expenses and returns for 320 and 480 acre farms.

Item	Unit	320 Acre Farm			480 Acre Farm		
		General	Primarily Livestock	Primarily Cash Crop	General	Primarily Livestock	Primarily Cash Crop
Crops							
Wheat	acres	30	30	30	55	55	55
Corn	acres	55	55	55	80	80	80
Milo	acres	33	33	33	49	49	49
Soybeans	acres	20		38	25		47
Sorghum (silage)	acres	12	22	6	20	30	9
Alfalfa	acres	20	30	10	26	41	15
Pasture	acres	130	130	130	195	195	195
Livestock							
Deferred steers	head	37	37	37	55	55	55
Winter, fatten heifers	head	42	98	0	60	128	0
Total investment	dol.	51,289	58,886	44,706	75,777	84,997	67,635
Gross farm income	dol.	11,429	16,637	8,760	17,046	23,394	13,197
Total expenses	dol.	7,799	11,162	6,520	11,011	15,015	9,062
Net farm income	dol.	3,630	5,475	2,240	6,045	8,379	4,135
Interest on investment	dol.	2,779	3,232	2,386	4,099	4,649	3,614
Return to operator's labor and mgt.	dol.	851	2,243	-146	1,946	3,730	521
Total expense per $100 gross income	dol.	68	67	74	65	64	69
Return to operator's labor and mgt. per $100 investment	dol.	1.66	3.81	-.33	2.57	4.39	.77