

A PROGRAM OF FARM MANAGEMENT  
FOR EXTENSION

by

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## BACKGROUND AND REVIEW OF PREVIOUS WORK

### Definition of Farm Management

Farm Management is defined as, "the science of the organization and operation of farms." It considers the effectiveness of different sizes of operating units and of combinations of productive resources, enterprises and practices of operating units; programs of adjustment for agricultural areas; and the impact of public policies and programs on economic activities on farms.<sup>1</sup>

This definition is no broader than the problems considered by a well-planned and well conducted farm management program that is fully serving the interests of farm people. The essence of farm management is a study of the economics of the farm firm.<sup>2</sup>

### Definition of Other Terms

Land - for the purposes discussed in this thesis will be considered one of the prime factors of production and will include the buildings, fences, wells and water management structures. Whether owned or rented it is a part of the investment managed.

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<sup>1</sup>Journal of Farm Economics, February, 1941

<sup>2</sup>Farm Record Analysis in the Extension Program, North Central States Sponsored by the Farm Foundation, October, 1950.

Capital - will refer specifically to working capital, including livestock, grains, roughages, protein feeds, and all other farm tools, implements and equipment. It is also a part of the investment managed.

Labor - will include all the work of the farmer, his family and hired help. It is measured by man months and in some states by productive man work units.

Management - as used in this paper refers to the decision making of the farmer and his family and the assumption of the risks or consequences of such decisions.

Credit - A service furnished to the farmer by the owners of money or those who control its use.

Markets - A service to the farmer in getting his products to the consumer; local, special and centralized or terminal markets are recognized. Special markets include those where graded eggs or graded milk sell at a premium.

Gross Income - Gross farm income includes cash receipts less sales of equipment and real estate, improvements plus increases or minus decreases in the inventory values of crops, livestock, and orchards, and minus feed and livestock bought.

#### Objectives of a Farm Management Extension Program

1. To teach farm families how to analyze their resources of land, labor and capital to ascertain the limiting factors in each.

2. To teach farm families how to organize their resources for production - planning what and how much to produce - the choice between alternative use of resources.

3. To teach farm families how to improve their operational planning or day to day operations.

These objectives cover a broad field as indicated in the definition of the term farm management.

Their significance can be judged by a partial classification of the work now being carried on under each objective. To teach farm families to analyse their land resources farmers are assisted in making simple classification of their land according to its slope and soil type. The acreage suitable to row crops and small grains is noted. They are encouraged to take soil tests in parts of the state where fertilizer application is a profitable practice. Pasture land condition, carrying capacity, fencing and water facilities are reviewed. Basic data of this type is necessary in planning the best use of the land as a resource.

Analysis of the labor available includes the total labor of the farmer and his family plus any hired labor that is available. In this connection the skills and past experience of the farmer are important factors in planning the use of this resource.

The analysis of capital breaks down the family's property into (1) cash, cash value of insurance, bonds and other non-farm investments, (2) readily saleable value of livestock, feed, grains and supplies, (3) depreciated value or current sale value of farm machinery, tools and equipment. These three classes are properly called the working capital of the farm firm.

Land is usually regarded as fixed capital for accounting purposes.

Before these three production factors, land, labor and capital can be joined for the maximization of net income to the farm family the most important limiting factor of each resource must be studied for comparison with the others. In studying resources the limiting factor of one frequently dominates and tends to control or limit full exploitation of the other two resources. The ultimate purpose of resource analysis is to approach as nearly as possible the full use of all three. Land tenure and lease activities are a part of this objective. This first objective then might be termed an inventory of the factors of farm production. This is the first function of management.

The second objective - planning what and how much to produce is the second function of management. It includes putting the three factors or resources of production to work with full recognition of their limitations.

To these, management, a fourth factor, now adds the use of available services, such as credit, transportation and markets both ordinary and special. Under this objective according to Carl Malone a farm management program must teach the farmer to frequently ask himself four key questions:<sup>3</sup>

1. How large should the business be?
  - a. Would he profit or lose by use of:
    - (1) More land
    - (2) More working capital
    - (3) More labor

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<sup>3</sup>Making Your Farm Pay - Carl Malone

2. How should the parts of the business be combined?
  - a. More grass and legumes
  - b. More grain
  - c. More cash crops
  - d. More roughage
  - e. More summer fallow
3. What practice should be used?
  - a. Own a combine or hire cutting
  - b. Harvest a seed crop or cut more hay
  - c. Is there a better crop for the farm
4. Is the farm plan in line with the best estimated of future prices and costs?

In making right decisions on these questions the farmer and his family apply their best judgement to determine the point of maximum income where the last unit produced just pays for itself. Without calling them by name or recognizing the theory the good farmer applies the concept of marginal revenue and marginal cost and the law of diminishing returns. In the case of some individual producers of purebred livestock, an example, of the development of animals of such quality that they tend to create their own demand, may be observed.

In planning what and how much to produce the ability to make wise decisions will always be crucial. Management in farming like management in industry is highly rewarded and indispensable. It is the magic fire that gives power to the production machine.



Under this objective the extension farm management program should provide comparisons or standards which farmers could use in choosing production enterprises both as to size and combination. In planning the production, especially in choices of crops and livestock enterprises, considerations typically include such questions as these:

Does the enterprise fit:

1. The land the buildings, the fences? If not, are the necessary changes practical and within the family's financial resources?
2. The available markets and transportation facilities?
3. Other enterprises now on the farm?
4. The labor available?
5. Available capital?
6. Family skills and previous experience and preference?

Will the new enterprise increase or decrease the total risk in the business?

If the risk is increased are the chances of profit also increased? Long time outlook and price cycles are considered here.

The second objective of the farm management extension program in planning what and how much to produce is to put the tools of economic theory to work for farm families.

The third objective is to teach farm families how to improve their operational planning or day to day operations. Under this objective the following items are considered:

1. Short time outlook for prices and supplies of the major farm commodities.

2. Labor utilization, work simplification and efficient use of electric, gas and diesel power are management problems.

3. Interpretation of the latest production research findings from experiment stations and other authentic sources in such a manner that farmers can apply those results to a point where the last unit of production just pays for itself.

4. A careful study of a complete well kept farm and home account book will show some of the strong and weak points in a farmer's management of certain enterprises but it does not tell why or exactly how. Enterprise records are also needed.

5. The use of input-output factors on certain enterprises fall under this objective.

While decision making in the use or rejection of new and ever changing production techniques on the farm is not of equal importance with the decision making under the first two objectives; its effect is cumulative toward success or failure. In actual farm production the decisions are not separated in neat clear lines under the objectives listed but rather they are often intermingled and woven in a complex and dependent pattern.

The analogy of the spider web is appropriate wherein a wrong decision in day to day operations may weaken or break a small section of the web and conversely a right decision strengthen or enlarge it. Either way the effective is cumulative. But a right or wrong decision in combining the

major factors of production is like strengthening or breaking a main support of the web. It will alter the size and shape of the business almost immediately, causing it to collapse or expand.

#### Purpose of this Study

Kansas and other states have widely varying extension programs in farm management. With the rapidly changing techniques in agricultural production new applications of economic principles and theory to the farm as a firm or business must be developed.

Farmers and county agents are busy, hard working people. They have little patience with theory, as such, but are greatly interested in its constructive application. A farm management extension program that is doing only the same things in 1952 that it did in 1942 is out of date. For example, the field of outlook once was dominated by the agricultural colleges and their extension program. In 1952 nearly every farm monthly or weekly magazine has a condensed well written page of outlook or forecast information near the front cover. Commercial organizations are bidding for leadership and competition is keen in the outlook field.

It is the purpose of this study to seek out new methods for conducting a more effective program of extension farm management. The basis of the study is in accordance with the outline at the beginning.

## A Brief Sketch of Farm Management

Antiquity gives only shrewd observation concerning farm management. The Romans like the Anglo-Saxons and other conquerors obtained much of their knowledge of agriculture from their conquered enemies.

Early writers on agriculture include Marcus Porcius Cato (234 - 149 BC). His *De Agri Cultura* constitutes our earliest extant specimen of Latin prose. He blazed trails for his more eloquent successors in the field and is often quoted by them as an authority. His opening paragraphs are still excellent observation.

When you are thinking of acquiring a farm keep in mind these points: that you be not over eager in buying nor spare your pains in examining, and that you consider it not sufficient to go over it once. However often you go, a good piece of land will please you more at each visit. Notice how the neighbors keep their places; if the district be good, they should be well kept. Go in and keep your eyes open, so that you may be able to find your way out. It should have a good climate not subject to storms; the soil should be good and naturally strong. If possible it should be at the foot of a mountain and face South; the situation should be healthful, there should be a good supply of laborers, it should be well watered and near it there should be a flourishing town, or the sea, or a navigable stream or a good and much travelled road. It should be among those farms which do not often change owners; where those who have sold farms are sorry to have done so. It should be well furnished with buildings. Do not be hasty in despising the methods of management adopted by others. It will be better to purchase from an owner who is a good farmer and a good builder.

When you reach the steading, observe whether there are numerous oil presses and wine vats; if there are not, you may infer that the amount of the yield is in proportion. The farm should be of no great equipment, but should be well situated. See that it is equipped as economically as possible, and that the land be not extravagant. Remember that a farm is like a man - however great the income, if there is extravagance but little is left.

The master should have the selling habit, not the buying habit.

Marcus Terentius Varro (BC 116-26) whom Quintilian called 'the most learned of the Romans' ranking him with Cicero and Virgil, probably studied agriculture before he studied anything else, for he was born on a Sabine farm, and although of a well-to-do family was bred in the habits of simplicity and rural industry.<sup>4</sup>

Varro discussed the laying out of a farm, the use of alfalfa and other legumes and green manure crops as a rotation. The Romans developed their own tests for sour soil using this formula:

Fill a basket with soil and strain fresh water through it. The taste of water strained through sour soil will twist awry the taster's face.

A history of agriculture,<sup>5</sup> begins with the Nomadic pastoral stage where soils were half worked and harvests meager. Plant culture was separate from animal culture, later women turned field work to men. Oxen were used in cultivation and harvest.

At this stage there was no thought of an efficient rotation of crops, no idea of alternating tillage with carefully prepared pastures and no notion of a naked fallow system. To an extent not found in any subsequent type nature is the determining factor. Early and irregular abandonment of fields in favor of new land was the characteristic of this stage. It continued from the time of Christ until the nineteenth century in Europe and into the twentieth century in America.

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<sup>4</sup>Roman Farm Management

<sup>5</sup>A History of Agriculture N.S.B. Gras - Chapter II, New York, F. S. Crafts and Company, 1925.

A second stage of agriculture, the naked fallow conserved moisture. This stage began with the formation of the small agricultural village, and continued in the feudal states of the middle ages. While one field was being used for crops a second which had become exhausted or foul with weeds was fallowed. At a later stage the variation of this system included division of the farm into three fields. The system was wasteful of good land. The gross yield of wheat under this system was six to eight bushels per acre in Medieval England and four centuries showed no change.

The legume rotation stage was begun by the Romans before the time of Christ. Their first alfalfa seed was obtained from the Greeks, their conquered enemies. The Greeks obtained it from Asia and the Persian Wars. The naked fallow system gradually gave way to the complete legume rotation. The Romans used some manure.

At the decline of Rome the use of legumes also contracted and they were not widely used again until after the middle ages.

The next stage - field grass husbandry was chiefly in the early modern period. This system included a longer rotation and included the use of grasses and grass and legume mixtures. Lime or Marl was used in England to sweeten acid soils. Part of the improvement of agriculture can be attributed to the growing population and increasing pressure on the demand side.

As a modern science farm management began in 1902. Professor Andrew Boss began studies of costs of production at the Minnesota Experiment Station in cooperation with the United States Department of Agriculture.

About 1906 the office of Farm Management was set up in the United States Department of Agriculture. In 1912 W. J. Spillman wrote an article entitled "What is Farm Management?" From 1915 to 1918 Spillman was head of the Office of Farm Management.<sup>5</sup>

Extension enterprises were inaugurated in Texas in 1904 under Doctor B. T. Galloway's direction as chief of the Bureau of Plant Industry which came to be known as a Farmer's Cooperative demonstration work.<sup>6</sup>

The originator and leader of this work was Seaman Asahel Knapp (1833-1911). Under his leadership the first county agent, W. C. Stallings, was appointed on November 12, 1906. The work grew rapidly. In 1910 the work was in progress in 455 counties in 12 states, and there were 450 county agents.<sup>6</sup>

In its county extension work the office of Farm Management stressed each agent's studying the business of farming in his county in order to know the agricultural situation and the needs of the farmers, and urged basing the extension program on needs revealed by such studies. Through special state and federal farm management demonstrations, county agents were taught to analyze the business of farmers, to determine the strong and weak points of the farm system, and aid the farmer in making needed adjustments.<sup>6</sup>

The number and variety of extension specialists connected with the agricultural colleges grew steadily in all the states as funds for their work increased under the operation of the Smith Lever Act.<sup>6</sup>

The most important projects in which the subject matter specialists were employed were those in dairying, animal husbandry, poultry, agronomy, horticulture, agricultural engineering, farm management, marketing, rural organization and home economics.<sup>6</sup>

The farm management demonstrations which had been a unique feature of the extension work of the Bureau of Plant Industry were carried over into the States Relations Service and became a permanent activity of the Office of Extension work in the North and West. In 1917 twenty seven states cooperated in this work, twenty four state agents were employed cooperatively, and the number of counties with supervised farm management demonstrators had risen to 342. The business of many farms was analyzed, suggestions for its improvement were made, and in that year 12,797 undertook to keep accounts.<sup>6</sup>

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<sup>6</sup>Page 58 - A History of Agricultural Extension Work. Alfred Charles True Washington, U. S. Gov't. Print Office, 1928

A major difference between the farm management specialist's work and that of other extension specialists is that while they look at a particular enterprise or marketing activity with the idea of developing maximum efficiency and production on one item, the farm management specialists must view the farm as a unit weighing the labor, capital and land requirements of each enterprise against its contribution to the entire farm as a business. The farm management specialist have an adequate working knowledge to judge efficiency and production standards of the various enterprises. In its final analysis farm management is the proper selection of the alternative uses of land, labor and capital which are available on any one farm. A review of the farm management extension educational program reveals that in the past better correlation of subject matter specialists and farm management specialists would have been a sound policy. It would have helped eliminate the confusion of conflicting recommendations to farmers from different specialists working in the same county independently and without agreement on basic principles. The farm management specialists tended to invade the field of the production specialists and the productions specialists tried to interpret the economics of their particular field. Some conflict and overlapping of responsibility occurred. It has not been clarified in all states at the present time.



## MANAGEMENT PROBLEMS ON KANSAS FARMS

## Examples

Available Resources. According to the census figures Kansas farms have grown in size and value at an increase of slightly more than two percent a year since 1935.

Table 1. Average size and value of Kansas farms, 1935 - 1950

Year	Average size in acres	Average value in dollars
1935	275	\$ 3,469
1940	308	\$ 9,092
1945	344	\$13,962
1950	370	\$24,756
Percent Change 1935 - 1950	Increase 35%	Increase 292

Source U. S. Census

Kansas farms have increased in value since the 1950 census, hence the average Kansas farm represents an investment in excess of \$25,000 in land and buildings.

A study of net worth statements in 1951 farm account books indicates that many farmers have a larger investment in working capital (machinery, feed, livestock and grains) than in the land and buildings. It is reasonable to assume that the average total investment managed per commercial farm in Kansas exceeds \$50,000 in 1952. Many small farms do not reach this amount but others are more than double that figure.

Some of the major problems that confront many Kansas farms are:

1. The risk involved in managing a large amount of capital.
2. What shifts to make in the farm business in order to maintain net income in a period of declining prices.
3. How to avoid over-investment in farm implements and make efficient use of needed equipment.
4. How to compete with the growing industrialization of Kansas for competent farm labor.

Table 2. Hired labor trends on Kansas farms, 1935 - 1945

Year	No. Farms reporting	No. of persons	Percent decline - 1935 = 100
1935	19,365	26,034	100
1940	16,058	25,601	1.7
1945	8,210	11,397	56.2

Source - U. S. Census

5. Can the young man of limited means succeed on a small farm? How can the start be made in view of declining tenancy in the state?

Table 3. Trends of tenancy and farm size in Kansas, 1935-1950

Year	Percentage of tenancy	Average farm size - acres
1935	44.0	275.0
1940	44.9	308.2
1945	36.6	344.0
1950	29.9	370.0

Source - U. S. Census

6. Industrialization has expanded the demand for Grade A milk in certain areas. The alternative use of resources for a dairy enterprise is up for consideration on many farms especially the smaller units.

7. Small farms frequently lack the efficiency of size in their operations. They are hampered by lack of working capital in a trend of increasingly higher cash operating costs. The use of lime and fertilizer on such farms is frequently below the level of greatest return.

8. New developments in production techniques are constantly bringing more of the factors of production under man's control - the price a higher cash cost.

9. More labor saving short-cuts are needed as the Kansas farm through mechanization assumes the characteristics of a factory.

Many other management problems exist on Kansas farms. Those mentioned are for the purpose of example.

P. H. Stephens, Economist for the Farm Credit Administration, Wichita, Kansas, recently reported that available resources on the average Kansas farm include approximately \$25,000 in land and buildings and a similar amount in working capital. The 1950 census reports 208,441 family and hired workers on 131,394 farms, slightly in excess of one and a half workers per farm. Thus it appears that the farmer as a manager has land and working capital about evenly divided with an investment of approximately \$33,000 for each worker.

Available Services. In addition to these major resources include credit to assist in operating the business, transportation and markets to dispose of production efficiently. The results of experiment stations offer standards of comparison in yield per acre and production methods. This is true in the fields of agronomy, animal husbandry, dairy husbandry, poultry husbandry, horticulture and marketing.

Credit. In the field of credit 431 state and 174 national banks and 14 production credit associations furnished money to finance from production in Kansas. Private individuals are also a factor in extending credit especially to young farmers just getting started but no accurate data are available on the amount or extend of individual's loans in the field of agricultural production. For returning veterans who want to farm, government insured loans have been of assistance. Capital requirements of farming are increasing. Many returning veterans have been able to get a substantial beginning in farming where they were favorably known in their community. A larger number, however, are on small farms and lack the necessary capital to produce in competition with established operators. Many returning veterans need larger farms that are not available. When on-the-farm training programs have ended those veterans who remain inadequately associated with sufficient capital to manage will drift into other industries or soon become hired workers on larger farms. Farmers Home Administration helped some young farmers get started.

The financing of land ownership by banks, insurance companies, the Farm Credit Administration and private individuals shows that farm mortgage credit is now increasing.<sup>7</sup> Farm mortgage indebtedness declined 44.5 percent from 1940 to 1951 in the Great Plains area but increased 7.2 percent 1950 to 1951. In Kansas the percentage change of farm mortgage debt from January 1, 1950 to January 1, 1951 was 8.1 percent higher. During the same period non-real estate loans increased by 25.7 percent in Kansas.<sup>7</sup> In 1949 farmers non-real estate loans reached 6.1 billion dollars in the United States and exceeded the total farm mortgage debt of 5.1 billion.<sup>7</sup> This is a new relationship that had not previously existed. It indicates the increasing importance of operating or working capital.

The relative importance of credit sources to farmers is shown by the following tables (4 and 5).

Table 4. Farm mortgage debt outstanding in the United States, January 1, 1951

	Amount 1,000 dollars	Percentage
Individuals and miscellaneous	2,338,008	40.1
Life insurance companies	1,340,705	23.0
Federal land banks	947,431	16.3
Insured commercial banks	943,387	16.2
Farmers Home Administration	214,077	3.6
Federal Farm Mortgage Corporation	44,008	.8
U. S. Total	5,877,520	100.0

Source: Balance Sheet of Agriculture for 1951. Agricultural information bulletin No. 73. Bureau of Agricultural Economics U.S.D.A.

<sup>7</sup>Balanced Sheet of Agriculture 1951 - pages 33-38. Agricultural information bulletin No. 73. Bureau of Agricultural Economics U.S.D.A.

Table 5. Farmers non-real estate debt in the United States, January 1, 1951

	Amount billion dollars	Percentage
Insured banks and federally sponsored agencies	3.4	48.6
Loans and book credits by individuals and miscellaneous lenders	2.8	40.0
Commodity credit corporation	.8	11.4
U. S. total	7.0	100.0

Source: Balanced Sheet of Agriculture for 1951. Agricultural information bulletin No. 73. Bureau of Agricultural Economics U.S.D.A.

These tables indicate the importance of the individual lender in the field of credit, whereas banks and other federally sponsored agencies receive most publicity and are commonly thought to be the major source of credit.

The national balance sheet for agriculture indicates a high equity of farmers in their business. The census for 1950 indicates a declining percentage of tenancy in most states. Both factors point to the trend of land and working capital accumulation in strong hands. A further evidence is the increase in the size of farms.

These trends indicate competition for land to farm is strengthening and getting started in farming is increasingly difficult for the young man without substantial backing and practically impossible for older men who lack starting capital.

Marketing. Only parts of Kansas offer outlets for Grade A milk and graded eggs. These areas center around the larger cities such as Kansas City, Wichita, Topeka, Salina and other larger centers.

A definite seasonal pattern in prices of fluid milk exists as shown in the table below.

Table 6. The 15 year average (1935-49) blended price of Grade A, 3.8 percent milk in the Kansas City milk shed.

Months	Price per cwt in dollars	Percent of yearly av.*	Months	Price per cwt in dollars	Percent of yearly av.*
January	\$3.178	102.1	July	\$2.846	91.5
February	3.135	100.8	August	3.0832	98.8
March	3.046	97.9	September	3.157	101.5
April	2.966	95.3	October	3.300	106.1
May	3.046	97.9	November	3.345	107.5
June	2.862	92.0	December	3.357	107.9

Source: Adapted from Agricultural Economics Report Number 46, Department of Agricultural Economics, Kansas Agricultural Experiment Station.  
\*Not corrected for error due to cyclical trend.

Farmers of Kansas sell most of their meat animals through the following market channels:

- 153 auctions
- 39 cooperatives
- 922 dealers
- 3 terminal markets - Kansas City, Wichita and Parsons
- 1 concentration yard - Kansas City
- 44 packing plants

The distribution pattern of livestock sold off farms is illustrated in the following diagram:<sup>8</sup>

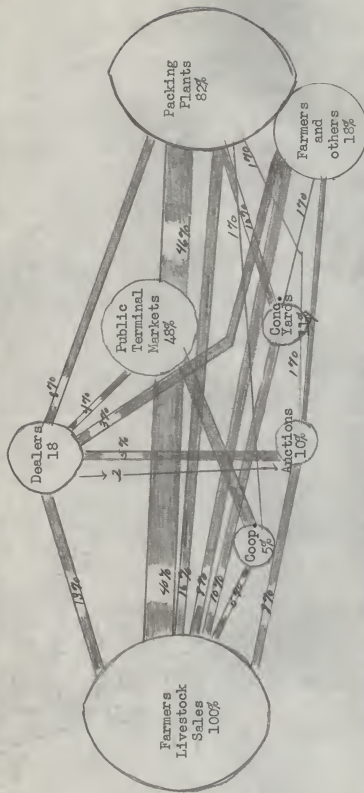


Fig. 1. Channels of livestock movement from farms in the corn belt region to packing plants, farmers and other users, 1940.

<sup>8</sup> Bjorka, Knute, Marketing Margins and Costs for Livestock and Meat.



Of all livestock combined (based on car lot equivalents) marketed by farmers in the region 82 percent went to packing plants for immediate slaughter and 18 percent to farmers and others. Cattle, calves, and sheep and lambs sold through terminal public markets in relatively larger proportions than hogs. Hogs were sold direct to packers and through concentration yards in relatively larger proportions than other livestock.<sup>8</sup>

The markets available to farmers are many and varied. The farmers share of the consumers dollar increases in inflation and decreases in periods of deflation. In periods of deflation consumers do not spend as many dollars. Costs of middlemen are not flexible and fall very slowly in periods of deflation.

In 1939 farmers received 38 cents out of the consumers dollar.<sup>9</sup>

In 1947 farmers received 54 cents out of the consumers dollar.

Table 7. Portion of the consumers dollar, spent for farm products, which went to the farmer and to various middlemen's services in 1939.<sup>9</sup>

Name of service or handler	Number of cents received from each dollar
Retailers	.24
Wholesalers	.07
Processors	.21
Transportation	.07
Assemblers	.04
Farmers	.38

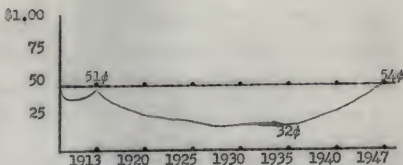


Fig. 2. Portion of the consumers dollar spent for farm products which went to the farmer 1913 - 1947.<sup>9</sup>

Markets for cash grains such as wheat, corn, soybeans, oats, barley and rye are more numerous in Kansas than the livestock markets. At most of the country elevators facilities for obtaining local or terminal grain storage exist. Nearly all grain dealers who provide such storage issue warehouse receipts on which the grower may negotiate a loan with the Commodity Credit Corporation for a period of time, usually not exceeding one year. Such loans have done much to distribute farmers sales of grain in a more orderly volume throughout the year. In a large measure such loans have reduced the risks of holding grain beyond the normal seasonal low.

The patronage of farmers cooperatives for handling grains and feeds has been much larger than for livestock. Cash markets for grain represent about the most efficient and best regulated of the various services offered to the agricultural industry.

<sup>9</sup>Mauch Arthur - Unpublished lecture notes, University of Michigan, 1948.

Market services for farm products tend to be increasing in number and kind. Extremely high consumer prices are partly if not largely the fault of the consumer's demand for extra services. As an off the farm service the individual farmer has little control over his market. In the field of grain marketing many cooperative elevators have been established in Kansas in an effort to partly control marketing charges and return a larger share of the consumers wheat dollar to the farmer.

Experiment Station Results. Credit and marketing have been briefly outlined as off-the-farm services available to farmers. A third service of increasing importance to farmers is the results of experiment stations. These results cover vast fields of knowledge, study and research in Agricultural Economics, Agronomy, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Horticulture, Entomology, Plant Pathology, Veterinary Medicine, Agricultural Engineering and Home Economics. A major function of the Extension Service of the land-grant colleges is to interpret and carry the results of such study and research to the people of the state and to present the information in an attractive, practical and useful manner. The farmer in common with other small businessmen is in no position to spend from five to fifteen percent of his total annual operating costs on research. He must depend partly on experiment station results to keep abreast of new developments in the field of his greatest interests..

The efficiency and value to the taxpayers of funds spent on research by agricultural experiment stations is dependent not alone on the quality

and quantity of research, but also on the skilled selling ability of the extension service in securing a wide acceptance and practical use of the new information.

The two groups can function efficiently as a team. Nearly every new product requires a well planned sales campaign. Nearly every star in the fields of business, entertainment or athletics owes much to the supporting cast. The functions of research and extension in the field of education are analogous to the functions of the departments of research and sales in any large corporation. The long time major objectives of the two groups are the same, but the short time objectives are nearly always at variance — hence, the occasional conflict — the sharpening of steel against steel.

Managerial Problems. The kind, size and number of enterprises on any farm are governed by these factors:

- |   |   |
|---|---|
| 1. Location of the farm                             | 6. Markets available                          |
| 2. Kind of soil                                     | 7. Working capital available                  |
| 3. Annual rainfall and length of growing season     | 8. Labor available                            |
| 4. Topography of the farm                           | 9. Buildings and fences                       |
| 5. Personal preference of the farmer and his family | 10. Government price programs                 |
|   | 11. What other farmers in the neighborhood do |

From East to West across the state of Kansas the choice of enterprises tend to diminish. In much of the western half of Kansas graded markets for milk and eggs do not currently exist. Wheat and milo are the crops

of greatest comparative advantage; pasture acreage is smaller than cropland acreage. Livestock as a source of income moves from seventy-nine percent in type-of-farming area 2 to twenty percent in area 10a and 10b.<sup>10</sup>

In central and eastern Kansas farms use more intensive enterprises and frequently a larger number. Labor requirements of livestock farms are higher than cash grain farms. On some of the most successful small farms of eastern Kansas there has been a tendency to specialize on one enterprise such as dairying or hog production or deferred feeding of steers. There are many examples of such specialization in the membership of Kansas Farm Management Association farms. It is usually easier to obtain a good volume of production with no more than two or three enterprises that can use the available resources of land, labor and capital to the best advantage.

One of the best methods to use in selection of enterprises is by the budget or partial budget comparison.

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<sup>10</sup> Making Your Farm Pay -- Cir. 226, Kansas State College, Extension Service, J. H. Coolidge and H. C. Love - a seven year summary of farm management associations high income farms.

The example that follows uses this method to compare three livestock enterprises:

1. A cow herd producing stocker calves.
2. A cow herd producing creep fed calves.
3. Deferred feeding steer calves.

Current prices for feed and livestock are compared with the long time 1922-41 prices. Since the buying power of the 1952 dollar is approximately one half of the 1922-41 period the comparison is designed to produce \$3,000 above feed cost in the long time average period and \$6,000 above feed cost at present day prices. The comparison offers a practical approach to a farm management problem.

Table 8. Partial budget comparison of three livestock enterprises using long time price averages and current prices.

	Cowherd producing		Cow herd		Deferred fed	
	400 lb feeder calves : 1922-41	1952	green fed calves : 1922-41	1952	steers gaining 500 lbs : 1922-41	1952
Returns over feed cost	\$ 3,000	\$ 6,000	\$ 3,000	\$ 6,000	\$ 3,000	\$ 6,000
*No. cows or steers needed	214	70	71	44	100	89
Selling price per 100 lbs.	9.00	35.00	12.00	33.00	12.00	33.00
Gross gain per unit	36.00	140.00	90.00	248.00	72.80	165.00
Feed cost per unit	22.00	57.00	47.70	112.00	42.40	97.00
Profit above feed fed	14.00	83.00	42.30	136.00	30.40	68.00
Livestock investment	17,120.00	14,000.00	5,680.00	8,800.00	3,600.00	12,460.00
Feed investment	4,708.00	3,955.00	3,387.00	4,937.00	4,240.00	8,660.00
*Total investment	21,828.00	17,955.00	9,067.00	13,737.00	7,840.00	21,120.00
Hours labor per unit	17	24	27	29	14	15.7
*Total hours labor	3,638	1,680	1,917	1,276	1,400	1,400
*Return per hr. of labor	1,280	280	425	176	400	356
Pasture acres	54	18	18	11	17	15
Silage acres	107	18	35	11	33	15
Oats or barley acres	-	-	24	11	33	22
Corn or milo acres	-	-	60	19	100	56
*Total acres	1,441	316	562	228	583	464

The items (\*) are of special interest for comparison purposes. The creep fed calf program is shown to have several advantages, but a high degree of managerial ability is needed to keep the cows calving in the fall and care for the winter calves.

The choice of practices within each farm enterprise usually has much influence on its net returns.

The three systems of producing beef on the farm illustrate one enterprise which sells calves at what is normally considered the seasonal and annual low, while the other two systems sell fat cattle near the seasonal and annual high for cattle of that grade or class.

In this connection it may be noted that some large cattle ranches in the range territory of the southwest have changed their marketing dates to the spring. The calves are then short yearlings but usually have increased over the fall weight and seasonally tend to sell for a higher price per pound.

Seasonal lows for most farm production occur at the period when the largest quantities reach the market. Seasonal highs tend to compensate for off-season production.

The farm which sells hogs in November and December must plan on low production costs per animal and large volume for profit. In contrast the producer who markets in the seasonal high of August and September expects a higher price per pound and greater profit per unit but the higher price is needed to offset higher production costs.

The seasonal high is not always the most profitable time to sell. The time of production is an important managerial problem.

On farms where capital is quite limited the operator will usually find off-season production and marketing at the seasonal high makes the best use of his labor and limited capital.



When capital is plentiful and labor is the limiting factor a more extensive operation can be planned following the most natural production method of least labor cost, such as farrowing pigs on pasture in late April or early May. The Kansas Farm Management Association has records on two hog farms. Each farm has a large and profitable enterprise. The one, a hog specialty farm contains only 210 acres and farrows approximately ninety sows twice yearly for seasonal high marketings. The second farm also makes a profit on hogs but as a secondary enterprise. Nearly ninety sows are farrowed late each spring. Both farmers use excellent production methods but the second depends on low cost production and low labor requirements. He operates more than seventeen hundred acres with one hired man.

#### FACTS, PRINCIPLES AND SOURCES OF DATA FOR A FARM MANAGEMENT EXTENSION PROGRAM

##### Farm Management Research by Experiment Stations

This work includes the summary and study of farmers' account books in many states. In addition to the analysis of such records special case studies are made on certain farms where records are available for a period of five, ten or fifteen years. Supplemental information is obtained on these farms including cost-of-production enterprise records. Where there has been a change in the cropping program, crop rotation or livestock enterprise such studies are effective in showing results obtained from the change.

The survey method of farm management research was begun in Tompkin's County, New York, in 1908. This survey has been repeated every ten years. Many other similar farm management surveys have been made in different states of this country and also in foreign countries.<sup>11</sup>

Data obtained from surveys taken at regular intervals, five or ten years apart, show much change in the dollar side of farming. Cost-of-production accounting has been used in obtaining farm management data, especially in Minnesota. Research by this method is expensive and slow and it is not widely used at present.

A third general farm management research method frequently combines survey and account book analysis to obtain reliable data on cost of operation, yields per acre and production standards in livestock enterprises. To these data prices at a given period of time are applied. The result is a budget approach to the problems of farm management. With the budget method it is possible to appraise the probable results of different livestock and crop enterprises on the same farm.

The budget method considers the entire farm as a unit and measures the net results of different enterprise combinations. The method necessarily makes more assumptions than other types of farm management research. It may be regarded as the master pattern to which other parts of farm management research, by survey, cost studies, enterprise records and the analysis of complete farm records, contribute an important part.

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<sup>11</sup>V. B. Hart and S. W. Warren, Farm Management Manual - Comstock Publishing Company, 1951.

Use of Agronomic and Livestock Research Results by  
Extension Farm Management

Some recommendations made by Extension Farm Management specialists are based on data obtained from research in the fields of agronomy, dairy, poultry and animal husbandry. It is the job of farm management extension workers to subject such information to economic analysis and make suggestions to farmers for its application to their farming operations. Here is an example from the small grain studies released at Agronomy Field Day, Manhattan, Kansas, June, 1950.

Table 9. Summary of wheat yields for fertilizer trials, 1948 - 1949.

Treatment, lbs 1 A.C. :		Time of application :		Yields at Manhattan, bu/a		
N	P <sub>2</sub> O <sub>5</sub>	N	P <sub>2</sub> O <sub>5</sub>	1948	1949	Average*
1.			Seeding	34.1	23.5	28.8
2.	0			37.3	30.2	33.7
3.	25	0	Pre-seeding	33.1	26.9	30.0
4.	50	0	broadcast	41.3	28.4	34.8
5.	25	50	seeding	46.1	32.2	39.1
6.	50	50	"	51.9	34.6	43.2
7.	100	50	"	53.0	36.6	44.8

\*The average column was added

The economic problem is to determine the amount of fertilizer that will give the maximum net return. The price of wheat being given at \$2.00 per bushel, P<sub>2</sub>O<sub>5</sub> at 9¢ per pound and nitrogen at 12¢. Table 10 shows the results of such an analysis.

Table 10. Analysis of fertilizer application on wheat at varying rates.

Treatment	Gross	Fertilizer	Returns above	Gain or loss per
N P <sub>2</sub> O <sub>5</sub>	returns	cost	fertilizer costs	lb. of fertilizer
1. 0 - 0	\$57.60	0	\$57.60	0
2. 0 - 50	67.40	\$ 4.50	62.90	\$10.6¢
3. 25 - 0	60.00	3.00	57.00	-24.0¢
4. 50 - 0	69.60	6.00	63.60	\$12 ¢
5. 25 - 50	78.20	7.50	70.70	\$17.5¢
6. 50 - 50	86.40	10.50	75.90	\$18.3¢
7. 100- 50	89.60	16.50	73.10	\$10.3¢

The objective of fertilizer application on wheat and other crops is to maximize net income per acre. The data in Tables 9 and 10 represent the research data available on fertilizer application on wheat at the Kansas Agricultural Experiment Station, Manhattan, Kansas. The data in Table 10 indicates the application of fifty pounds of nitrogen and fifty pounds of phosphate was the most profitable as shown on line number six. The weakness of this experimental data is the large gap in the application of nitrogen between line six and line seven. It is possible, for example, that sixty, seventy or seventy-five pounds of nitrogen plus the fifty pounds of phosphate would give a larger net return than the applications shown on lines six and seven, yet there exists no proof for such a hypothesis. The point where marginal costs are equated with marginal revenue may have been substantially above the treatment shown in line six. For practical purposes the farmer might use somewhat more nitrogen than the amount shown in line six. Any change in the price of wheat or the price of fertilizer would of course move the point at which margin revenues equalled marginal costs. Similar analysis can be applied to experiment station results in dairy, meat animal and poultry production.

## Actual Farm Data on Enterprises and Whole Farm Units

There are four methods of obtaining on-the-farm data:

1. Survey methods
2. Complete cost accounts
3. Enterprise studies
4. Summary and analysis of complete farm account books

1. The survey method has been most widely used as an economic research tool. Properly conducted the results are detailed and as accurate as the sample survey and the statistical analysis applied to the data. The survey represents one of the spot judgement or opinion of a large number of people. Some have accurate records to back up their answers to many questions in a farm management survey while other have no records at all. The survey method is perhaps the cheapest and most rapid method to get a large amount of farm management data.

2. Complete cost accounts proved slow, expensive and not well adopted to rapidly changing economic conditions. The results were not of as much practical value as was once thought. Relatively little research data is collected on that basis at the present time.

3. Enterprise cost studies of wheat production, corn production and the other major crops provide important production data that is useful in making budget comparisons to study alternative use of resources. Rapid changes in agriculture have brought increasing cash costs and more of the factors of production under the farmers control. These changes make it advisable to bring enterprise cost studies up to date by repeating the study every five years.

Enterprise studies on some of the major livestock enterprises are obtained in Kansas each year by the Extension Animal Husbandry Specialists. Crop enterprise studies tend to have a greater degree of uniformity and fewer variable factors than the livestock studies thus tending toward a more general use and application of the data.

4. The summary and analysis of more than one thousand farm management association farm account books is one of the major activities of farm management research in Kansas. On the basis of the 1950 census the association members represented one and fifteen hundredths percent of all the farms in Kansas. In 1950 the association farmers whose books were analyzed had an average farm size of 793 acres compared to the state average of 370 acres.

The farms are analyzed by type of farming areas and a total of fifty seven items are compared. In the past farms have been typed or classified within each type of farming area as follows:

1. High 25%, Low 25% and average
2. By size of farm as measured by crop acres
3. By type of farm based on the source of 40% of the gross income

Because of the large number of detailed questions left unanswered in the analysis of a complete farm account book, data from this source is supplemented by case studies and by survey methods.

The data that are obtained from the summary and analysis of complete well kept farm account books has wide acceptance among farmers as a source of information. The data are used by banks and Government lending agencies

in the study of the farm business and as a basis for recommendations to farmers.

#### The Coordination of Information Through the Use of the Budget

When a research worker or an extension worker plans to make a budget study of two or more enterprises certain basic assumptions regarding costs, prices, yields, rates of gain, gain per hundred weight of feed fed and time of marketing products must be made. Farm size and sources of income vary widely in Kansas. One of the advantages of a budget comparison is its specific application to a given type of farming area. A budget comparison set up under eastern Kansas conditions would be of little value in western Kansas. In choosing production standards and yields the results of experiment station research represent an excellent source of facts. Farmers tend to view a budget comparison with more favor if the major assumptions regarding production and costs have been compared with farm account records and farm surveys in the area under consideration. In any given area the average farmer will lag behind experiment station production and efficiency but a few farmers will exceed experiment station results.

The budget approach has never been widely used by Kansas farmers in planning their business. Nevertheless it is sound in that it considers the farm-as-a-unit. Its use could result in a substantial improvement in the organization and income of Kansas farms.

## METHOD OF FARM MANAGEMENT EXTENSION EDUCATION

A Comparison by Survey of the Farm Management  
Extension Programs in the Thirteen North  
Central States

A comparison was made by survey of the Farm Management Extension programs in the thirteen North Central States as follows; Kansas, Nebraska, South Dakota, North Dakota, Missouri, Iowa, Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, and Kentucky.

The survey was made and results were tabulated by a sub-committee of the North Central Farm Management Extension Committee, under the sponsorship of the Farm Foundation, Chicago, Illinois. The assignment to the sub-committee was entitled: Major Farm Management Problems, including evaluation of farm management extension activities.

The members of the sub-committee were: Carl Malone, Iowa, Chairman; S. B. Cleland, Minnesota; Paul W. Griffith, Kansas; and H. W. Herbison, North Dakota. A questionnaire entitled "A Summary of Current Emphasis in Extension Farm Management" was sent to Extension Economists. The results are given under six major headings and are shown on the following pages.

Items marked with the asterisk (\*) are currently included in the Kansas Farm Management Extension program. A rough interpretation of this information indicates that any item scoring six or higher is widely accepted as an important part of the farm management extension program in the west north central states' region.



Table 11. A summary of current emphasis on six phases of extension farm management work in the thirteen north central states - 1948

	Major emphasis	Minor emphasis		Major emphasis	Minor emphasis
	Number of States	Number of States		Number of States	Number of States
	Farm management:	Other	Farm management:	Other	Other
	specialists:	specialists:	specialists:	specialists:	specialists:
<b>I. OVER-ALL FARM ORGANIZATION</b>					
<b>A. In use of land &amp; water resources</b>					
1. Cropping systems	8*	3*	3	2	2
2. Livestock systems	7*	3*	3	2	2
3. Soil & water mgt. or conservation	4*	4*	6	1	1
<b>B. In use of labor &amp; equipment</b>					
1. Improved mechanization	0	2	11	3	3
2. Better labor utilization	3	1	7*	4*	4*
a. In job analysis & work organization	1	0	6*	1*	1*
b. Job inst. training & supervision	0	1	4	1	1
c. Relationships & bargaining	1	0	1	1	1
d. Housing and feeding	1	0	7	2	2
e. Wage & profit-sharing practice	3	0	5	2	2
<b>C. In use of capital and credit</b>					
a. For current operations	2	0	6*	4	4
b. Investments in land, lstrk., equip.	4*	0	7	4	4
c. Improvements (bldg, water, irrig., etc.)	3*	1	7	4	4
d. Savings, reserves, social security	3	1	5	3	3

Table 11. (cont.)

	Major emphasis	Minor emphasis	Number of States	Number of States
	Farm Management: Other specialists	Farm Management: Other specialists	Farm Management: Other specialists	Farm Management: Other specialists
<b>II. AFFECTING MANAGERIAL ADJUSTMENTS</b>				
<b>A. Concerned with farm outlook information</b>				
1. General, or long-time type of change	0	0	2	2
2. Specific as to time & enterprise	8*	4	4	5*
	6	5*	5*	5
<b>B. Concerned with analysis of farm business</b>				
1. General enterprise or type of farming area	9*	0	2	5*
2. Specific as to individual farms	7*	0	3	2
<b>C. Concerned with better use of program aids</b>				
D. Those connected with public policy	2	0	7	7
	3	2	7	8
<b>III. TECHNIQUES OR TOOLS EMPLOYED IN FARM MGT. EXT.</b>				
A. Teaching farmers to keep farm records	7*	0	4	0
B. Teaching farmers to study & use farm records	8*	0	3	1*
C. Income tax accounting aids for farmers use	5*	0	5	0
D. Fed. farm, or farm & home planning	4*	0	6	2
E. Group approach to farm & home planning	7	0	3	3*
F. Organized farm management associations	7*	0	2	3
G. Special study groups or night classes	2	0	5*	4*
H. Land use planning with farmers & others	3	0	5*	3*
I. Farm Management clinic; for special jobs as:				
1. Land appraisal	4	0	4*	3

Table 11. (cont.)

	Major emphasis		Minor emphasis	
	Number of States	Other Farm Management specialists	Number of States	Other Farm Management specialists
2. Land use classification	2	0	6*	3
3. Farm and field layouts	2	0	6*	3
4. Farmstead & building layouts	3	0	7*	2
5. Water development & management	1	0	7*	1
6. Tours, (management)	3	0	1	1
7. Tours, (entertaining)	0	0	1	0
8. Pasture-forage-livestock (Meb. plan)	1	0	0	0
9. Farm leases	1	0	0	0
IV. PUBLIC PROGRAM PLANNING & RELATIONSHIP WORK				
A. With other departmental agencies	2	0	5	6
B. With college spec-research sup'r staff	6*	5*	4	5
C. With civic & legal government groups	2	0	6	5
D. With farm organizations	2	3	8*	5
E. County Ext. planning committees	1	0	1	2
V. SPECIAL HELP TO FIND PROPER USE OF NEW TECHNOLOGICAL DEVELOPMENTS IN FARM BUSINESS				
	2	0	5*	3*
VI. EMPHASIS DIRECTED TO POP. GROUPS BY FARM MGT.				
A. Youth, (A-H, FHA, in school & other)	6*	2*	10	-6
B. Young farmers, including veteran groups		4	5	-5
C. Adult farm operators		0	1	-1
D. Non-farm people	7*	0	7	-5

Source: Farm Foundation, Chicago, Illinois. \*Includes Kansas

From this survey it is apparent there is not standard or exact pattern of conducting a program of farm management extension education in every state. Differences in training and interests of extension specialists together with problems peculiar to any one state cause variation in the program presented. Extension farm management programs like other educational or operational functions tend to become fixed and difficult to change once they are established. The North Central States have done more farm account book and record summarization work than any other region in the United States.

In summary of the above table the following features of the farm management extension program appear to have widest application in all the thirteen states surveyed. By inference they are the most important.

I. In over all farm planning and organization

A. In use of land and water resources

1. Planning cropping systems was used by eight of the thirteen states.

2. Planning livestock systems was used by seven.

B. Improved mechanization was of minor interest in eleven states.

C. Use of capital and credit has received only minor emphasis in the majority or seven states and major attention in only four.

II. Affecting managerial adjustments

A. Farm outlook information

1. General or long time type of change was important in eight states.

2. Specific as to time and enterprise was of major importance in six states and minor importance in five.

B. Concerned with analysis of the farm business

1. General enterprise or type of farming area analysis was of major importance in nine states.
2. Specific analysis on individual farms was rated of major importance in seven states.

III. Techniques or tools employed in farm management extension. Those listed are of major importance in four or more states.

- A. Teaching farmers to keep farm records, seven states
- B. Teaching farmers to use and study farm records, eight states
- C. Group approach to farm and home planning, seven states
- D. Organized farm management associations, eight states
- E. Income tax accounting aids for farmers use, five states
- F. Individual farm and home planning approach, four states
- G. Farm Management clinic - land appraisal, four states

IV. Public program planning and relationship work

- A. With college specialists - research supervisory staff, six states

V. Emphasis directed to population groups by farm management extension

- A. To adult farm operators, nine states
- B. To young farmers including veteran groups, six states

The manner in which farm management specialists spent their time is indicated by the following weighted average summary of the thirteen north central states.

Major uses of total man months available -- farm management specialists

Outlook (separately)	14%
Farm management	71%
Public policy	5%
Marketing	4%
Miscellaneous	6%

The time spent on farm management was broken into ten major classes for twelve states reporting:

	Percent of time spent (12 states combined)
1. Farm and home planning	28
2. General farm management	14
3. Gather and analyze records	13
4. Veteran and older youth programs	9
5. Teaching and keeping of records	8
6. Tenure leasing and credit	8
7. Extend the analysis of records	7
8. Labor efficiency	6
9. Miscellaneous	4
10. Income tax	3

Of this time 42 percent was spent in training agents and leaders and 58 percent in helping farmers directly in various ways. By adding items 3, 5, 7, and 10 together it would appear that farm management extension workers in the thirteen states spent thirty-one percent of their farm management time on farm record work of some type. The thirteen states average 2.8 farm management specialists each. This figure does not include fieldmen in farm management associations. The highest number employed is six and the lowest is one.

Based on a 1947 survey files by a sub-committee of the North Central Farm Management Extension, Farm Foundation, Chicago, Illinois. It appears that extension farm management specialists in the thirteen north central states spend from twenty to twenty-five percent of their total working time on farm account records or analysis.

Since the county extension workers are important in any extension program this survey also included time spent by agents in thirteen states as per their statistical reports.

The fields of farm management and general economics are of only moderate importance in the program of county extension workers.

Percent of total time of county extension workers spent on

	Average of 13 states	Range High Low	
<u>Field work</u>			
<u>By county agents</u>			
Farm management	7.4%		
Outlook (separately)	0.9%		
General economics	1.8%		
Total	10.1%	19.1%	5.2%
<u>By home agents &amp; club agents</u>			
Farm management	1.1%		
Outlook (separately)	0.3%		
General economics	0.5%		
Total	1.9%	8.0%	0.2%

Of the various fields of subject matter the following shows the relative emphasis given by county workers. --

Field	By county agent	By home & club agent
Farm planning	58%	37%
Farm accounts	12	18
Outlook	9	14
Rural welfare	7	19
Land policy	5	3
Farm credit	4	4
Public finance	3	3
Price policy	2	2
	<u>100%</u>	<u>100%</u>

It is apparent that county workers find -

1. That farm people are less interested in economic problems than they are in the physical problems of production and family living; or
2. That the extension workers themselves do not feel as competent to deal with rural economic problems as with problems of technology; or
3. That farm people do not as often look to the county extension workers for help on economic problems.

The relative importance of these various reasons is not know at the present time. Farm advisory committees in several states seem to feel that extension should play a larger role in the economic and social field than they do at present.<sup>1</sup>

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<sup>1</sup>North Central States survey of 1947 reported in 1948 by the Farm Foundation Chicago, Illinois.



In the thirteen North Central States two extremes in farm management extension programs are represented by Illinois and Missouri. Illinois Farm Management Associations have a membership of approximately three thousand farmers and use fifteen months of the farm management specialist's time on farm records and twelve months on supervision. Missouri by contrast does very little farm accounting or record work but uses forty-three and one-half months of farm management specialists time on farm and home planning. The other North Central states fall between these extremes. Seven of the North Central states use Farm Management accounting associations with a full time fieldman supervising the records in each case.

Farmers have confidence in farm records analysis. Farm records perform an important role in the teaching process. Results of particular farm operations strike a note of realism that is difficult to obtain from controlled experimentation. This statement is not intended to suggest that information obtained from farm records is more reliable than information from other sources; it only means that the farmer's attitude regarding results of record analysis makes them generally more acceptable to a larger number of farmers. The results of farm record analysis and experimentation provide different types of information and for the most part they supplement each other.

To achieve success in agriculture today, it is important to know the best possible combinations of enterprises and then to do the job in the best possible way. Farm records help point the way toward enterprise combinations

that have proven themselves under farm conditions and have withstood the test of time. This is the point where technology of production and the science of management join hands. Best results are obtained when the family carefully considers both technology and management. This is farm planning or balanced farming.

Averages obtained from the summarization of farm account records frequently show wide variation from actual production obtained on farms and that obtained by experiment stations. While these averages do not provide any final answers they do offer authentic guides for comparison purposes. There are many factors concerning the farm business which the analysis of a farm account book will not give. The books show what happened but frequently do tell exactly how or why.

An example can be cited to illustrate the general nature of answers which are available in farm account books. If the average dairy receipts per cow in a given type of farming area is \$259.00 and an individual farm operator finds that his returns are \$325.00 per cow on a larger than average size herd a highly profitable farm operation is not always assured. Let us further assume that the gross income on this farm is above the average for the group but that the net income is substantially below the group average. Under this situation it is apparent that the difficulty is in the expense side of the business. These can be studied item by item against the average for the area but the large variation between farms will only point to the faulty management in a general way.

The major factors used in the analysis of account books will be discussed in the application of thermometer charts as a method of farm management education.

A second survey in the thirteen North Central states was made in 1948 by the Extension Farm Management Committee and reported by the Farm Foundation on the subject of farm and home planning with emphasis on Extension Farm Management specialists responsibilities and current work done in these states.

The chief difficulty reported by all states was the low volume of work accomplished in terms of the number of farm families which can be contacted in a given time by extension personnel. Some states have adopted a plan of holding general farm management winter schools in each county every other year. In the alternate years the specialists assist county agents with farm planning. Small group meetings were used successfully in the planning work. Farm Management specialists and county Extension workers held a series of three group planning meetings with farm families. These were two hour meetings at which the specialist and a group of 20 to 30 cooperators first discussed land use and crop systems.

The second session included a discussion of livestock systems. At the third session the county extension staff divided the group up into smaller groups of four or five and spent the day visiting each others' farms and discussing possible changes. In the evening these farmers worked out reorganization plans for their own farms. The county agent served as the coordinating link between the farmers, the farm management specialist and the other specialists. County agents arranged for other production specialists to visit the counties where the members of the planning group indicated their desire for assistance on special problems. Most of the states used the assistance available from the Soil Conservation Service,

and a few used assistance from the Farmers Home Administration.

The North Central states committee stated the farm management worker's contribution and responsibility in the report as follows:

#### Farm Management Worker's Contribution and Responsibility

There are two phases of farm and home planning that should be considered. These are (1) the planning phase and (2) putting the plan into operation.

Farm Management and home management specialists have a special responsibility in the first phase, that of getting plans made. These responsibilities are:

- (1) The development of working materials, procedures, forms, etc.
- (2) Training county agents in the techniques of planning, the use of working forms and materials important to getting plans made.
- (3) Assembling basic background information to be used by agents.
- (4) Cooperating in developing publicity and educational materials such as radio scripts, news stories, circular letters, visual aids, (slides, films, charts, etc.) publications, etc.

Farm management workers also have the responsibility of providing subject matter information in the field of farm organization and management principles in connection with both the development of plans and in providing necessary assistance in putting the plans in operation.

Farm planning is not just farm management. Farm management has an important part to play, but only a part. The fundamental reason for this is that farmers have to constantly consider and make decisions in three general areas. First, what to do and how much; second, when to make adjustments, and third, how to do the job. In general, farm people don't think of one of these areas independently of the others. From the farmer's point of view, it is harder to separate organization and management from production, than it is to tie them together.

Extension's real problem is how to reach effectively the 60 to 80 percent of the farmers who are unable to or do not care to apply this information in its present form to the solution of their problems.<sup>1</sup>

Planning workbooks of various kinds have been used in Missouri, Kansas, Michigan, Indiana, Nebraska, North Dakota and Ohio. The books provide essential forms organized for use by farm people so that they can systematically carry through the analysis of their own situation and based on this, determine changes that need to be made.

In preparing and using planning workbooks the following points have been considered:

1. That planning books are a tool to be used as a means to an end and not the end. The planning procedure should result in corrective action on the part of farm people or it is not justified.
2. That an effort be made to simplify forms now being used.
3. In most states there are a group of farmers who are anxious to do all pencil work necessary to prepare a complete plan and put it on paper. This should encourage sufficiently to provide demonstration material.

Other aids include enterprise check sheets, information, handbooks, slide sets and charts. Radio is an excellent means of getting interest and attention in extension programs. Farm and home planning has been the main theme of several sound films produced by commercial concerns.

County agents have many demands on their time. Agents have not had wide demands from farmers for this type of extension education. In many states the problem of selling work of farm and home planning has been a limiting factor. Coupled with the lack of requests has been the time

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<sup>1</sup>Farm and home planning - report of North Central Farm Management Extension Committee - July, 1948 - Farm Foundation, Chicago, Illinois.

consuming nature of farm and home planning work and the heavy personal service requirement. These characteristics account for the slow development of farm and home planning as a method of extension education.

#### Report of Survey of Kansas Farm Management Association Members

Farm Management Association work began in Kansas in 1930 with the first association account books analyzed in 1931. In 1950 the association work was expanded to all type-of-farming areas in the state. In an effort to learn what farmers value most in the different parts of farm management extension association work a ten percent sample of the membership was selected from each of the six associations. The sample was made by numbering the association members and then selecting ten percent of the names using tables of random numbers.

The questionnaire was designed to evaluate some of the parts of

- a. The farm account book
- b. Outlook and marketing information furnished weekly and monthly
- c. The major items usually discussed by the fieldman at the time of his farm visit.
- d. Summary and analysis meetings held each spring.

These were the specific parts of the association work which members were asked to rate or rank. After rating these items individually an attempt was made to obtain the members rating of the major features in the educational program in farm management. These features include:

The account book

Outlook and marketing information

Farm visits with the fieldman

Summary and analysis meetings

Special fall outlook meetings

Those receiving the questionnaire were asked to list three recommendations which in their judgement would be most useful in improving the effectiveness of the farm management program.

Of the one hundred fifty questionnaires sent out one hundred twenty three or eighty-two percent were returned. One hundred twenty two rated the items. Seventy seven replies listed additional suggestions or comments.

The results were tabulated by listing and adding the rating numbers. The lower the total number assigned to any item the higher its rating by farmers.

The ratings on the various parts of the account book were either not clearly recognized by the respondents or there is wide variation in their appraisal of the function and usefulness of the different forms or parts of the farm account book. This is shown by the close or inconclusive ranking as judged by the totals of the rating numbers. The questionnaire, rank and rating number totals are shown in the Appendix.

The seventy-seven who made additional comments offered one hundred-nine different suggestions. Those suggestions which were made five times or more are summarized as follows:

<u>Subject</u>	<u>Times Requested</u>
1. Requests for more farm visits by the fieldman.....	25
2. Suggested more definite statements and price forecast in the outlook and marketing information.....	13

3. Like the present program without any changes.....	11
4. Requested more farm planning.....	9
5. Request for more instruction on income tax.....	9
6. Farm management tour requests.....	5
7. Request for cooperative livestock buying program.....	5
8. Request more group or county meetings by fieldman and other specialists.....	5

Observations based on the survey and suggestions of the Farm Management Associations in Kansas.

1. While the farm account book used by the members is ranked the second most important part of the work, certain important parts of the book such as the crop production record and livestock record are given low in value.

2. Members place a high rating on the summary and analysis of their own record. Apparently 80 percent of the members refer to the five-year comparison of income and expense summary and to the five-year record of the analysis of the farm business.

3. Of the four types of outlook and marketing information furnished to association members, the fieldman's weekly newsletter to members of the association served by him ranked first for the state as a whole. There appeared to be a personal relationship factor in this ranking. Letters from the veteran fieldmen ranked first by a wide margin in three associations. In the two new associations and one older association the fieldman's letters ranked second or third. In personal interviews with some of those answering



the questionnaire, it was learned that the members valued the timely reminders of their fieldman. The high rating of the fieldman's letter emphasizes the influence and importance of personal contact with farmers.

4. It would seem desirable for those who write market comments for farmers to ride with the fieldman a few days at different times throughout the year. Such contact should be helpful to the farmer, the fieldman and the resident staff in understanding each others problems.

5. The large request for more farm visits by the fieldman indicates that the efforts of the fieldman may be spread too thin among the members and that his work is not as effective as it should be.

6. Several suggestions indicated a desire to reach more people with the work of the associations. These came especially from those who said they were satisfied with the present program.

7. Because of the physical limits of time and manpower, the only practical way to reach more farm families through association work is by developing good demonstrations in Balanced Farming and Family Living on the farms in each county; and by actually holding public field days on these farms, to demonstrate the management principles and to show the results. This probably means fewer cooperators and more time spent on each cooperator's farm at the time of the visit. This appears to be one method of getting more hours on the farm per mile traveled.

Application of the Thermometer Chart to Ten Year  
Case Histories of the Association Farms

The thermometer chart has been widely used as a farm record analysis tool. Its use is based on the hypothesis that the individual farmer can compare his records with the average and with the low and high one-third or one-fourth of other association members in his type-of-farming area, and learn some of the strong points and some of the weak points in his business.

A second recommended use of the thermometer chart has been measuring the progress or improvement made by a farmer through comparing a number of years' records to learn whether the business actually was changed or improved in line with the strong or weak parts of the business as indicated by the charts.

For example, if the chart showed crop yields were consistently low in the early part of the period; was there any improvement later? A second example would be, far above average returns for the investment in one live-stock enterprise and low returns from another to be shown on the thermometer chart. In this situation the farmer would have the alternative of enlarging the strong enterprise if that seemed advantageous. In the case of the weak enterprise, the choice might be either improvement or elimination.

The purpose of this study was to learn whether thermometer charts made up from analyzing Kansas farm account books offer any guides to improving the farm business or whether such guides must be obtained wholly from other

sources. It has been frequently stated that a well kept and carefully analyzed farm account book tells what happened, but does not tell why or how.

One of the difficulties in accepting as valid one year's results of a thermometer chart is the fact that it is a little like attempting to measure the distance between two swinging pendulums which sometimes swing in the same direction for one measure or management factor, but in opposite directions for another.

A preliminary study of the group averages of the various factors used in making thermometer chart comparisons indicates the following:

1. That group averages vary from year to year, but usually do not show as much variation as one farm may show.
2. On some cost measures such as machinery investment per crop acre and machinery costs per crop acre, the group average tends to form a trend with only an occasional deviation. Such trends follow the general price level.
3. The measures of yields and physical management do not always form definite trends that are satisfactory to use as standards or measures of progress. For example, during the five-year period 1941 through 1945, the percent of cropland in legumes, in type-of-farming area 8 showed a variation from 15.4 percent in 1944 to 21.7 percent in 1942; and for the five-year period averaged 18.1 percent. During the next five-year period 1946 through 1950, the same measure varied from 13.5 percent in 1946 to 17.7 percent in 1949; and for the five-year period averaged 15.5 percent

or 2.6 percent below the previous period. The high income farms in the same area averaged 18.6 percent for 1941 through 1945 and 14.6 for the period 1946 through 1950. Declines in the two groups were fairly comparable; however it does not follow that such an adjustment on every farm would have been most profitable. Such an adjustment would be dependent on previous legume rotations, the amount of fertilizer applied and whether the farm was a cash grain or a livestock farm.

For this study three farms of better than average incomes were selected in three different type-of-farming areas. Thermometer charts for the period 1941 through 1950 were prepared on the basis of nineteen different measures.

In comparison number one the average of association members in the type-of-farming area for every year and for each item was taken to represent 100 percent. The plus or minus percentage figures in the tables for the three farms represent variations above or below the average for that item for that year.

Farm A is in Riley County. The cropland is above average quality bottom land.

Farm B is in Marshall County. The cropland is upland, with some erosion and below average quality.

Farm C is in Clay County. The cropland is both upland and bottom land of average quality.

Table 12. A ten year case study showing the percentage variation above or below the area average on nineteen measurement factors. Type of farming area 5, Farm 4.

Factors	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	Summary
Investment managed	-6.6	*1.0	*3.0	*16.7	*18	*15.4	*19.8	*8.0	*16.2	-1.7	8*
Gross income	*2.8	-32.2	-16.8	*22.3	*23.4	*13.0	*8.8	*21	-3.8	-5.2	6*
Total acres	-13.5	-13.8	-18.5	-26	-20.1	-24.1	-4.5	-8.8	-5.6	-32.1	10-
Number of men	-26.1	-23.9	-20.0	-45	*31.5	*15.7	-5.3	*5.2	*16.6	-32.6	4*
Percent in legumes	-2.1	*13.8	*45.7	*40.8	*21.3	-9.8	*44.1	-1.6	*17	-29.3	6*
Yield per acres											
Wheat				*35.0	*13.7	- .5	-7.7	*43.7	-11.7	-13.1	3*
Corn				*76.4	-32.3	*50.0	-63	-55.4	*11.1	*29.1	4*
Grain sorghum					*108	*9				*85.0	3*
Alfalfa					*28.5	*47.0	*45	*91.3	*30.4	*36.3	6*
Percent gross income from livestock	-24.5	-6.3	- .8	-24.2	*10.1	*7	*15.7	-3.0	-3.1	- .8	7-
Egg rec. per hen				*32.3	*31.5	*4.2	*34.7	*15.7	*24.2	*15.5	7*
Dairy rec. per cow				*51.9	-1.7	*28	-4.6	-5.2	-42.3	*16.6	3*
Gross income per man	*39	-10.9	*4.0	*12.0	-6.2	*1.98	*14.8	*15.7	-17.6	*38.6	3-
Grop acres per man	*33	*25.9	*25.5	*77.9	-23	-3.7	*23.8	*3.3	-23.6	*32.2	7*
Mach. inv. per crop acre	-2.4	*15.6	*36	*25.7	*8.9	*9.9	-11.3	-21.1	*33.6	*16.4	7*
Mach. cost per crop acre	-15.5	-7.3	-14.3	-15.4	-15.1	-8.2	-19.9	-13	*14	*15.0	2*
Expense per 100.00 gross income	-55.7	-37.4	-61.2	-45.4	-32.6	-44	-48.8	-46.8	*2	-27.9	9*
Net farm income	*117	*56	*68	*127.2	*101.1	*87.2	*83.4	*127.4	-9.7	*33.8	9*
Net. for labor and management	*219	*14	*98.9	*199.6	*147.9	*114.4	*91.6	*156.8	-81.5	*37.6	9*

Table 12. (cont.) Type of farming area 8. Farm B

	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	Summary
Investment managed	*55.0	*54.3	*57.9	*37.5	*8.1	*7.1	*26.7	*26.7	*31.5	*36.4	10*
Gross income	*10.6	*11.0	*5.3	*37.9	*28.7	*21.5	*4.9	*27.4	*57.8	*17.8	10*
Total acres	*63.4	*58.0	*66.8	*14.3	*20.2	*50.8	*57.2	*71.4	*40.1	*36.0	10*
Number of men	*13.6	*9.0	*22.2	*17.6	*30.0	*21.0	*44.4	*35.0	*15.8	*73.7	10*
Percent in legumes	*48	-32.8	-51.4	-5.9	-21.2	*71.6	-40.2	*101.2	*4.8	-16.3	4*
Yield per acre:											6-
Wheat				*20.7	*42.8	-19.5	-10.5	*8.1	*57.1	*16.1	5*
Corn				-51.6	-17.3	-2.4	*20.0	-24	-19.5	*14.5	2*
Grain sorghum						*13.6	*17.6	-31.3	-36.9	*21.3	3*
Alfalfa				-5.0	-72.3	-16.7	-20.0	-47.4	-55.6		6-
Percent gross income											
from livestock	-37.9	*3.3	-40.3	-41.4	-52.5	-30.3	-42.0	-41.9	-28.3	-40.5	1*
Egg rec. per hen				-17.4	-62.7	-5.8	-57.0	-32.6	-74.5	-84.7	9-
Dairy rec. per cow				-62.0	-43.2	-12.8	-60.5	-50.0	-65.8	-74.2	7-
Gross income per man	2.8	*1.8	-10.6	*17.2	-9.4	*9.4	-28.4	-5.6	*36.3	-32.2	4*
Crop acres per man	*84.7	*40.6	-2.1	*27.2	*13.0	*60	*42.1	*55.4	*39.4	-12.8	8*
Mach. inv. per crop											2-
acre	-1.1	-1.2	*36.8	*28.6	*41.0	*6.0	*23.1	-12.7	*8.6	*57.4	7*
Mach. cost per crop											3-
acre	*32.9	*44.0	*42.2	*28.2	-4.3	-13.3	-10.3	-25.4	*20.7	*41.8	6*
Expense per 100.00											
gross income	*5.3	*32.0	*11.1	*7.5	*11.9	-8.8	*15.3	*4.9	-3.5	*22	8*
Net farm income	*5	-2.8	-8.1	*18.5	-3.9	*36.9	-16	*17	*71.9	-16.0	5*
Return for labor											
and management	-78.1	-45.8	-57.1	-4.1	-46	*44.6	-33.5	*6.7	*89.5	-46.3	3*

Table 12. (cont.) Type of farming area 6a. Farm C

	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	Summary
Investment managed	*5.8	*32.4	*43.3	Not	*20.4	*10.1	-4.9	-6.9	*10.8	-1.2	6*
Gross income	*32	*34.1	*36.6	Avail-	*24.6	*10.8	*13.7	*38.9	*43.6	*14.7	9*
Total acres	*51.8	*52.7	*52.5	able	*47.5	*38.4	*26.6	*33.9	*31.8	*37.7	9*
Number of men	-31.6	-16.7	-13.4			*22.2	*5.8	*5.8	*33.0	-13.4	4*
Percent in legumes	*46.7	*20.8	*64.6		-27	-15.0	*6.2	*46.4	-7.2	*233.0	6*
Yield per acre											3-
Wheat					*10.7	*11.1	*2	-4.8	-2.0	-15.8	3*
Corn					*36.4	*46.3	*7.1	*13.6	-9.1	-22.2	4*
Grain sorghum					-50					*33.2	1*
Alfalfa					*26.3	-61.6		-26.4	-28.6	-53.2	1*
Percent gross income from livestock	-17.9	-23.3	-54.1								2*
Egg rec. per hen					-32.8	-48.0	-29.5	-8	*18.7	*39.6	2*
Dairy rec. per cow					*5.4	-3.4	*27.4	*49.0	-6.5	-15.1	3*
Gross income per man	*93	*61	*57.7		*11.9	-46	*29.1	*25.2	*20.9	*30.6	5*
Crop acres per man	*94	*69	*55.8		*24.6	-9.4	-7.3	*50.1	*7.7	*32.3	7*
Mach. inv. per crop acre					*26.3	*2.2	*10.8	*12.7	-15.9	*37.4	8*
Mach. cost per crop acre					*10.7	*6.9	*36.0	*62	-10.2	-12.6	5*
Expense per 100.00 gross income					*7.6	-10.7	*14.8	*4.6	*10.5	-6.4	5*
Net farm income	-52.4	-33.4	-6.5		-27.2	-34.6	-9.5	-27.8	-7.5	-26.3	9*
Return for labor and management	*157.9	*91.3	*65.8		*71.8	*62.9	*27.5	*144.9	*76.7	*71.3	9*
	*220	*87.9	*29.9		*104.1	*35.9	*27.6	*206.4	*25.8	*75.9	9*

1-The average equals 100% each year  
 \*Represents above average  
 -Represents below average

From Table 12 for each of the three farms it appears that variations from the average fluctuate greatly from year to year. These tables tend to develop a general pattern of the management on each farm. The large number of variables make specific conclusions difficult to obtain.

By studying the summary column for each farm the following generalizations may be made:

Farm A.

1. Investment managed and gross income were above average for eight of the last ten years.
2. Since total acres were below average for the ten years, the farm must be productive and well managed.
3. The number of men employed was below average for six of the ten years. There is no correlation between variation from average of the number of men employed and variations from average in net farm income.
4. Legume acreage was above average in six of the ten years and alfalfa yields above average for all years for which records are available.
5. Corn has given higher and more consistent yields on this farm than wheat.
6. Gross income from livestock was below the area average in all but three of the ten years.
7. The poultry enterprise appears strong and profitable on this farm.
8. Gross income per man, crop acres per man and machinery investment per acre were all above average for seven of the ten years. This showing coupled with lower than average machinery costs per crop acre for eight of the ten years indicates efficient use of labor and machinery.



9. An outstanding feature of Table 1 for this farm is the consistent below average expense per \$100 of Gross Income.

10. The same nine to one ratio, on the favorable side of Net Farm Income and Returns for Labor and Management indicate conservative successful management.

11. It is difficult to make suggestions for further improvement of the farm business on the basis of these generalizations.

#### Farm B.

1. This farm was above average in Investment Managed, Gross Income, Total Acres and Number of Men Employed. Thus, it was above average in all measures of size.

2. This farm was below average in six of the ten years on percent of legumes and consistently below average in yields of alfalf per acre during the six years for which records are available. This could indicate a shortage of available lime or phosphate or both.

3. Wheat was a more consistent producer than corn according to this summary. In the years grown, grain sorghums were above average three years out of five. This yield pattern is fairly typical for upland in this territory.

4. Gross income from livestock was below average of other members for nine of the ten years; thus indicating a minor importance for livestock and a major importance for cash grain.

5. Dairy and poultry enterprises appear to be below average in receipts and probably minor in nature.

6. Gross Income per Man below average for six of the ten years may indicate more income or less labor needed. Perhaps the best remedy would be higher crop yields.

7. Higher than average crop acres per man for eight of the ten years indicate good labor efficiency in crop production.

8. Machinery investment per crop acre is above average, but taken alone this is not significant. Machinery costs per crop acre were above average for six of the ten years. Some need for change and improvements in efficiency is indicated here.

9. Expenses per \$100 of Gross Income were above average for eight of the ten years. Since gross income was consistently above average some adjustment in the expense side of the business is indicated.

10. Net Farm Income was substantially above average for five years and slightly below average for five years. Returns for labor and management were below average for seven of the ten years.

11. Generalizations are based on the thermometer chart and offer some clues to possible changes toward increasing Net Income on this farm.

#### Farm C

1. This farm was above average in six of the nine years, for which records are available in Investment Managed. It was above average in Gross Income and Total Acres for the nine years. In Number of Men employed it was average four years and below average four years.

2. The percent in legumes was above average for six of the nine years but alfalfa yields per acre were below average for four of the five years for which records are available. Corn exceeded the association average more often than wheat. In general the crop yields were close to the association average for the area and were not outstanding.

3. Until the last two of the nine years of record the percent of Gross Income from Livestock was below average. Some increased importance in the livestock enterprise appears to have occurred in 1947. Livestock has been more important on the farm since that year.

4. Gross Income per Man and Crop Acres per Man were consistently above average for seven and eight years respectively. Machinery investment per crop acre increased more than average in 1947 and has been declining until the last two years were below average for this type-of-farming area. Machinery costs per crop acre were only slightly above average for five years and below average by a larger amount for four years.

5. Expense per \$100 Gross Income was consistently low for the nine recorded years. This indicates better than average management ability.

6. Net Income and Returns for Labor and Management were consistently above average for the nine recorded years, again indicating better than average management.

7. Generalization offer in the way of clues for improvement of the business. Perhaps the greatest possibility is improvement of Crop Yields.

To further analyze the cost side of operations on these three farms, cash machinery expense and machinery depreciation were compared with total operating expense for the period 1941 through 1950. This comparison is summarized in the following tables:

Table 13. The range of variation on eight management factors for three farms, 1941 - 1950

Factor	Farm A	Farm B	Farm C
Total acres	545 to 585	570 to 893	565 to 650
Crop acres	191 to 246	317 to 569	329 to 355
Percent in cropland	35 to 42	39 to 70	55 to 61
Total operating expenses	\$1996 to 9456	\$5534 to 14511	\$2567 to 10592
Cash mach. exp.	611 to 2054	\$1478 to 3891	545 to 2347
As a part of total expense	18.3% to 27.5%	26.7% to 36.7%	16.7% to 35.7%
Percent of average total expense	10 yr. av. 24.5%	10 yr av. 30.3%	10 yr. av. 26.0%
Total exp. per acre	\$3.66 to \$17.33	\$6.33 to \$20.39	\$4.54 to \$16.30
Average total exp. per acre 1941-45	5.46	9.55	6.58
Average total exp. per acre 1946-50	12.81	14.96	13.05
The dollar and the percent increase of second 5-yr. period over the first	\$7.35 124.6%	\$5.41 56.6%	\$6.47 98.3%

Observations on Table 13.

1. The wide range of variation in the factors listed indicates the changing and dynamic nature of a farm when it is studied over a period of time.
2. Cash machinery expense makes up 25 to 30 percent of the total operating expenses on these farms.

3. Machinery depreciation, a non-cash expense, accounts for approximately 20 percent of the total operating expense on these farms at the present time.

4. Operating costs practically doubled during the second five-year period.

5. Total operating costs when divided by the total acreage in the farm range from \$12.00 to \$20.00 per acre for the year 1950.

6. The wide range of variation in the factors listed, even on farms that are known to have better than average management, make specific recommendations difficult if not impossible.

7. In this comparison Farm B, the lowest net income of the three had the highest operating costs per acre.

The next consideration is that of cash sales or receipts. In an effort to determine changes in organization, these will be studied by five-year periods 1941 through 1945 and 1946 through 1950. Since this decade is one of almost constantly rising prices, percentages will also be shown.

Table 14. Farm organization changes as indicated by a comparison of absolute and percentage distribution of cash sales for two five year periods. Farm A.

	: 1941 - 1945		: 1946 - 1950		: 10 Year Total	
	: Cash	:Percent	: Cash	:Percent	: Cash	:Percent
	: Sales	:of total	: sales	:of total	: sales	:of total
Cattle	\$16,605	43.9	\$51,032	64.3	\$67,637	57.6
Hogs	3,560	9.4	7,927	9.9	11,487	9.7
Sheep	1,843	4.9	None	—	1,843	1.5
Eggs	6,155	16.3	7,441	9.3	13,596	11.5
Dairy prod.	2,575	6.8	3,377	4.3	5,952	5.6
Wheat	5,619	14.9	7,429	9.4	13,048	11.1
Corn	62	.2	1,481	1.9	1,543	1.3
Gr. sorghum	None	—	11	—	11	—
Others	1,388	3.6	745	.9	2,133	1.7
5 yr. Totals	37,807	100.0	79,443	100.0	117,250	100.0

Observations on Changes of Organization as shown for Farm A in Table 14.

1. Cattle sales increased three times in dollar value the second period over the first, but on a percentage basis the increase was only 12.4 percent or one-fifth.

2. Hog sales doubled in dollar value, but rose only five-tenths of one percent as source of cash income for the farm.

3. Egg sales fell six percent as a source of income.

4. Wheat declined five and one-half percent as a source of income for the farm.

5. Corn sales were minor as a source of income, but did increase slightly during the second five-year period.

Table 15. Farm organization changes as indicated by a comparison of absolute and percentage distribution of cash sales for two five year periods. Farm B.

	1941 - 1945		1946 - 1950		10 Year Total	
	Cash sales	Percent of total	Cash sales	Percent of total	Cash sales	Percent of total
Cattle	\$20,860	35.3	\$26,355	27.3	\$47,215	30.3
Hogs	9,423	15.9	16,648	17.2	26,071	16.8
Sheep	2,115	3.6	None	—	2,115	1.3
Eggs	341	1.4	1,021	1.0	1,862	1.2
Dairy prod.	990	1.8	499	.5	1,489	.9
Wheat	14,189	24.0	31,175	32.4	45,364	29.2
Corn	5,875	9.9	17,620	18.3	23,495	15.2
Gr. sorghum	None	—	52	—	52	—
Others	4,731	8.1	3,140	3.3	7,871	5.1
Total	59,024	100.0	96,510	100.0	155,534	100.0

Observations on Farm B from Table 15.

1. Cattle sales increased \$5495 during the second period, but fell eight percent as a source of total sales; thus indicating a smaller rather than larger cattle enterprise.

2. Hog sales rose \$6225 for the second period and increased 1.3 percent showing a slight increase in the importance of this enterprise.

3. The big changes in wheat and corn sales the second period over the first both in actual volume of sales and on a percentage basis show the definite trend to more cash grain farming on this unit.

4. Although Farm B sold a greater volume than Farm A, only twice in the ten-year period has net income on Farm B exceeded net income on Farm A. <sup>1</sup>

<sup>1</sup>This observation was not taken from data shown in the two tables, but from another ten-year study not shown here.

Table 16. Farm organization changes as indicated by a comparison of absolute and percentage distribution of cash sales for two five year periods. Farm C.

	1941 - 1945 *		1946 - 1950 *		10 Year Total	
	: Cash	: Percent	: Cash	: Percent	: Cash	: Percent
	: sales	: of total	: sales	: of total	: sales	: of total
Cattle	\$ 3,586	12.6	\$42,894	49.0	\$46,480	40.1
Hogs	4,034	14.2	6,802	7.8	10,836	9.4
Sheep	—	—	—	—	—	—
Eggs	2,199	7.8	4,251	4.8	6,450	5.5
Dairy prod.	626	2.2	1,069	1.1	1,695	1.5
Wheat	14,639	51.4	25,100	28.7	39,739	34.3
Corn	585	2.1	6,187	7.0	6,772	5.8
Gr. sorghum	None	—	59	—	59	—
Others	2,757	9.7	1,152	1.6	3,909	3.4
Total	28,426	100.0	87,514	100.0	115,940	100.0

\* 1944 not available

Observations on Table 16

1. Cattle sales increased both in total volume and as a percent of total sales by very important amounts. This indicates a definite swing toward the cattle enterprise in the second five-year period.

2. On a percentage basis hogs declined in importance as a source of income.

3. Wheat sales nearly doubled in volume during the second five-year period, but declined twenty-two and seven-tenths percent as a part of total cash sales in the farm business.

4. Corn sales increased during the second period indicating that yields were good and that the increased feeding of cattle did not use up the corn that had previously gone to the hog enterprise. Corn sales however were minor as a source of income



5. The net income of Farm C exceeds the net income of Farm B in seven of the nine years record.<sup>1</sup>

To compare the end results of any changes the operators of Farm A, B and C made, the second five-year period over the first period, the net farm income and the returns for labor and management are shown in table 15.

Table 17. The results of management adjustments on three farms as indicated by comparing average net income, percent change and returns for labor and management for two periods, 1941, 42, 43, 45 and 46-50.

	Farm A	Farm B	Farm C
1. Average net farm income 1941,42,43,45	\$ 5,877.02	\$ 4,098.59	\$ 5,494.87
2. Average net farm income 1946-50	10,349.60	6,658.32	7,554.25
3. Increase for 2nd period	4,472.58	2,559.73	2,059.38
4. Increase expressed as a percentage of the first period	76.1%	62.4	37.4
5. Returns for labor and management 1941,42,43,45	4,819.00	1,109.70	3,783.55
6. Returns for labor and mgt. 1946-1950 incl.	8,017.80	4,265.75	8,469.66
7. Increase for 2nd period	3,198.80	3,166.05	4,686.11
8. Increase expressed as a percentage of the first period	66.4	284.4	123.8

<sup>1</sup>This observation from data not shown in Table 16.

Observation on Table 17.

1. It is impossible to tell how much of the dollar increase during the second period is due to rising prices and how much is due to improve management, because commodities were produced in varying amounts and price relationships between the commodities were not constant.

2. The net income comparison shows much improvement over the previous period on line two for Farm B. In lines three and four the farms rank A, B, C, whereas on line two the rank A, C, B.

3. When considered on a basis of returns for labor and management, Farm B ranks last in comparisons on lines five, six and seven.

4. If improved management could be measured on the basis of increased returns for labor and management, the second five years over the first period, then Farm B has made the largest percentage gains of the three, followed by Farm C with Farm A the highest income operation showing the least improvement during the ten years.

#### Conclusions on Value of Thermometer Charts

1. Thermometer chart factors comparing one farm with the group average which show wide variation from year to year are of little value.

2. Thermometer chart factors which consistently rank above or below the average over a period of time do indicate strength or weakness in the business, but results of any one year are not always an indication of a needed change or adjustment.

3. Comparisons on the thermometer chart factor basis with technical or better than average standards empirically verified offer as much or more guidance than group averages for any one year.

4. Some recommended changes should be based on two or three years records.

5. The results of changes in management are more clearly shown when the thermometer chart factors for a farm are plotted side by side for a period of years than when they are compared with the averages of a group of farms.

6. Cooperating members of the Kansas Farm Management Associations are not keeping enough records of the physical factors of production to make possible the most valuable or detailed study of their business. Forms are provided in the books for such records, but relatively few farmers are making any use of them. One reason for this situation is lack of time for the fieldmen to assist and adequately supervise such records. A second reason is that farmers may feed several classes of livestock out of the same grain bin or silo and do not have the time or scale facilities to weigh both the feed and the livestock. Under these conditions careful estimates of farmers represent the only physical production data available over most of Kansas. Getting actual weight data from a few farms throughout the state would assist in checking the accuracy of such estimates.

7. If measures of physical production could be obtained and used in the analysis, the value of the account books as a teaching tool and for research purposes and case studies would be greatly enhanced.

8. Even if the account books were perfect in all details, there would still be need for special enterprise records and other studies. Farm accounts are most helpful in determining trends and verifying their extent.

9. Even the best farm account books leave many questions unanswered.

#### SUMMARY AND CONCLUSIONS

The purpose of this section is to draw together in summary form for ready reference the major points of the literature cited, the survey results and research in the field, as covered by this paper. Such a summary should have practical value in discussing farm management work with farmers, county agents and others interested in a program of farm management for Extension.

I. Farm management is defined as the science of the organization and operation of farms. Essentially it considers the farm-as-a-unit with alternative uses and combinations of the available resources and services.

II. The major objectives of the Extension Farm Management program are:

A. To teach farm families the principles of organizing and operating the farm:

1. By analyzing their resources

2. By making full use of resources by combinations of adapted enterprises.

3. By using actual production and cost data from farm records as a basis for selecting alternative enterprise combinations in developing farm budgets.

B. To teach farmers to apply economic principles to farm production:

1. By providing farmers with relationship studies of labor or time required per animal or per acre at different levels of production.

2. By providing farmers with budget or partial budget comparisons of certain widely used enterprises with emphasis on the capital requirements and managerial skill needed.

- C. To assist farm families in the application of outlook information to their farm business.

- D. To teach farmers how to keep adequate records and use them in improving their farm business:

1. By providing suitable account books

2. By analyzing a sufficient number of farm account books to obtain production standards for use in studying the farm-as-a-unit.

3. By helping farmers measure their financial progress

4. By providing information necessary for complete income tax returns.

- E. To provide information and necessary forms for farmers in making equitable farm leases and testing and adjusting such leases.

In carrying out these objectives the Farm Management Associations appear to have the following functions:

- A. To secure information not available from other sources:

1. By studying the farm business as-a-unit.

2. By case studies of various types of farm organization or enterprise combinations.

3. By obtaining actual farm data from special field history sheets and special enterprise records (each five years) on the capital investment requirements, equipment costs, production costs and amount of labor required for the major crop and livestock enterprises. (By setting up a schedule, two or three enterprises could receive attention each year.)

B. To provide counsel and guidance in analyzing and reorganizing the farm business -- applying the ten points of Balanced Farming and Family Living, production and outlook information to each demonstration farm.

C. To demonstrate to all farmers the results and benefits of farm reorganization by tours, meetings, reports and otherwise.

III. Farm management as a science was pioneered by professional men who were trained in the Agronomic field of crops and soils. It is a comparatively new science. The first major work was begun in 1902 when Professor Andrew Boss at the Minnesota Experiment Station made studies of costs of production. About this time, G. F. Warren of Cornell began a study of Farm Management using the survey method. The work grew rapidly. By 1917 twenty-seven states cooperated in the work and 342 counties had supervised farm management demonstrations. At the present time Farm Management and Farm Economics hold an important place in the Extension program of all land grant colleges and universities in the United States.

IV. The management problems on Kansas farms are fairly typical of the management problems on nearly every small owner operated firm. The most universal problems on Kansas farms include the following approximately in the order of importance on a state wide basis:

A. Insufficient capital to operate the business

B. The risk and high management ability involved in managing a large amount of capital.

C. How to avoid over investment in farm implements when farm labor is scarce.

D. How to make the best use of available resources and services.

E. What shifts to make in the relatively fixed management pattern of a farm business in order to maintain a satisfactory net income in a period of declining prices. In short, lack of skill in decision making.

F. The wide fluctuation of farm income from year to year.

G. The lack of graded markets for dairy and poultry products in many parts of the state.

H. How to start farming when the operating capital requirements and the size of farms keeps increasing.

V. Under the general heading "Facts, Principles and Sources of Data for a Farm Management Extension Program," four major sources are recognized:

A. Farm management research by experiment stations.

B. Individual crop and livestock research by experiment stations.

C. Data from records kept by farmers on enterprises and on the whole farm-as-a-unit. Such data have been obtained in three ways:

1. Survey method

2. Complete cost accounts

3. Analysis of a complete farm account book

D. The co-ordination of information from these various sources by preparation of a budget.

In Kansas the first three sources have received more attention in past years. Budget analysis as a teaching tool in Farm Management Extension has received special attention in connection with the Balanced Farming and Family Living Program of the Kansas Extension Service since 1946. Simplified workbooks have been provided for farm families to assist them in this type of planning.

Farm families are slow to use complete budgets. Budgets have been looked upon as complicated, theoretical and time consuming. For this reason, Extension workers have compromised by using a partial budget analysis. The partial budget compares livestock enterprises on the basis of returns above feed costs; thus making it comparable with experiment station data in animal production. This approach with all its faults has been more popular with farmers, partly because it is more familiar to them.

VII. A study of methods of Farm Management Extension education shows wide variation in emphasis and type of program offered in the thirteen north central states. If it can be assumed that items appearing the largest number of times in the thirteen states' survey are the most valuable, most universal in their appeal and are those which have been retained because they stood the test of time; the following represent some of the major activities in a program of Farm Management Extension:

- A. Over all farm planning and organization concerned with planning cropping systems and livestock systems were used in eight of the thirteen states.
- B. Those items affecting managerial adjustments such as analysis of



the farm business on a general enterprise basis or type of farming area analysis were of major importance in nine states. Farm outlook information was important in eight states when presented on a long time basis and in six states on the short time or enterprise basis.

C. Techniques or tools employed most generally in farm management extension include the following:

1. Teaching farmers to use and study farm records - eight states.
2. Teaching farmers to keep farm records - seven states.
3. Organized farm management associations - seven states.
4. Group approach to farm and home planning - seven states.
5. Income tax accounting aids for farmers' use - five states.
6. Individual farm and home planning approach - four states.
7. Farm management clinic - land appraisal - four states.

D. Farm Management Extension directed special emphasis to the following population groups:

1. Adult farm operators - nine states.
2. Young farmers including veterans' groups - six states.

E. In the thirteen states surveyed Farm Management specialists spent their time as follows:

Outlook (separately)	14 percent
Farm Management	71 percent
Public Policy	5 percent
Marketing	4 percent
Miscellaneous	6 percent

A breakdown of the time spent on Farm Management with twelve states reporting shows the following divisions of major importance:

1. Farm record work of various types	31 percent
2. Farm and home planning	28 percent
3. General farm management	14 percent
4. Veterans and older youth programs	9 percent
5. Tenure leasing and credit	8 percent
6. Labor efficiency	6 percent
7 Miscellaneous	4 percent

Of this time specialists spent 42 percent training county agents and 58 percent helping farmers directly in various ways.

Farm Management specialists spent between 20 and 25 percent of their total working time on farm account and farm analysis.

F. County Agents in the thirteen states spent 7.4 percent of their time on farm management in 1947. Home agents and club agents spent 1.1 percent of their time on farm management. It is apparent that county workers find:

1. Farm people are less interested in economic problems than they are in physical production and family living; or
2. That Extension workers themselves do not feel as competent to deal with rural economic problems as with problem of technology; or
3. That farm people do not look as often to the county extension workers for help on economic problems. Farm Advisory committees in several states seem to feel that extension should play a larger role in the economics

and social field than they do at present.

VIII. From the recently completed survey of a 10 percent random sample of the 1,500 farm management association members in Kansas, the following conclusions have enough support to be important;

A. The farm visits and newsletters from the fieldman rate first place in importance.

B. The complete farm account book ranks second.

C. Marketing and outlook information rate third place.

D. Summary and analysis meetings and special fall outlook meetings rate fourth and fifth respectively.

E. Farmers rated the major parts of the account book in the following order:

1. Income and Expense summary

2. Analysis of the farm business

3. Net income statement

4. The livestock record

5. The net worth statement

6. Crop production record

7. Inventory of payable and receivables.

F. Farmers place greater value on comparison of a summary and analysis of their own records for a period of years than on comparison with a group average for one year.

G. In suggestions for improving the work of the association, more farm visits by the fieldman ranked first, followed by an indicated desire for more definite statements and price forecast in the outlook and marketing information, requests for more farm planning, more income tax instruction and more farm management tours. Many who participated in the survey liked the present program and expressed a desire for it to reach more people. This is a current and important problem in the Kansas Extension Farm Management program.

IX. Application of the thermometer chart to ten year case studies of three farms in three type of farm areas made the following conclusions possible:

A. If measures of physical production could be obtained in the farm account books, the analysis and thermometer charts based on the analysis would give a more complete picture of the farm business both for research and extension educational purposes. Such measures are not easily obtained.

B. Even the most complete farm account books leave many questions unanswered.

C. When thermometer chart factors for a farm consistently rank above or below the group average for a three to five year period, strength or weakness in the organization or operation of the farm business is indicated. Results of any one year are not entirely reliable as a basis for recommending changes.

D. The group average fluctuates less than the individual farm. Because of this group fluctuation; technically derived standards based on input and output data, adjusted to conform with empirical research data, offers a more reliable measure of efficiency on many thermometer chart factors.

E. The most valuable thermometer chart information for the individual farmer can be obtained by comparing the results on his own farm over a period of three or more years. Group averages for a similar period of time obtained from farms of the same type, location and soil fertility would be helpful.

#### RECOMMENDATIONS FOR KANSAS

On the basis of the literature cited and the survey and research made in the preparation of this thesis, the following recommendations for the improvement of the program of Farm Management for Extension in Kansas are suggested:

1. Develop five or six Balanced Farming and Family Living demonstrations on the Farm Management Association farms of every county in Kansas.
2. Cooperate with the research staff in obtaining regularly each year special enterprise records on the cost of production of major crop and livestock enterprises. This work to be rotated in such a manner that data would be obtained on any major enterprise once each five years.

The information obtained from special enterprise records every five years would be useful in measuring trends in costs of production and changes in efficiency of production. Such data are in popular demand by farmers. Extension Economists need this type of information to compare the relative in-put and out-put advantages of different enterprises under farm conditions. The data would be useful in preparing budget or partial budget analysis comparisons. Research workers should be able to make rough comparisons with experiment station results at least on a physical input-output basis. To the extent that such records could be considered representative of an area it could serve as a source of empirical data on certain enterprises.

3. Obtain physical production measures in farm account books at every opportunity.

4. Obtain adequate financing for the Farm Management Associations and thus make the following possible:

- a. Fewer members in each association
- b. More complete books in each association
- c. More of the fieldman's time on the farm of each member to develop good demonstrations in Balanced Farming and Family Living.

5. The quickest, cheapest and best way to reach more farm families with the benefits of farm management research and reorganization that is now available to slightly over one percent of the farm families of Kansas is through public demonstrations and field days.

6. Reduce the work load of handling account books by analyzing only the most vital measures each year and making a complete analysis every third year.

7. Reduce the work load of tabulating account books by selecting only representative samples from each type of farming area each year.

8. Conduct farm management tours on a district basis once each year in each association.

9. Develop better visual aid materials to demonstrate farm management principles and to show the results of changes in farm reorganization.

10. Work with the research staff to test with empirical data various production functions of economics applied to specific farm production problems. Farmers are constantly requesting predictions and forecasts. Farm Management's major educational contribution may well be in this field in the years to come.

This does not imply that farm management association work and the analysis of farm account books should be stopped but rather that it should be improved and streamlined to lessen the physical and clerical load of doing the work and thus allow time, energy and funds for other types of farm management research in Kansas.

In conclusion the recommendations fall in two categories; first, changing or improving the work methods of present activities, and second, applying new types of research data to the field of farm management to give a broader more useful program.

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## APPENDIX

Questionnaire mailed to a ten percent random sample (150) of the fifteen hundred Farm Management Association members in Kansas. One hundred twenty-two replies were received between February and May 15, 1952. Final numerical rating and final rank have been inserted.

Dear Cooperator:

Your frank appraisal of the educational program in Farm Management as conducted by the Extension Service of Kansas State College is needed to help make it stronger and more effective.

Please rank or number the following parts of your Farm and Home Account book in their order of importance, use or value to you: (Number them 1-2-3-4-5-6-7-8)

Final No. Rating	Final Rank	
585	(7)	Inventory of Receivables and Payables (Form 8)
267	(1)	Income & Expense Summary (Form 11)
347	(2)	Analysis of the Farm Business (Form 11)
431	(3)	Net Income Statement Completed on Accrual Basis (Form 12)
533	(4)	Livestock Record, etc. (Form 13) --
582	(6)	Crop Production Record (Form 15)
579	(5)	Net Worth Statements (Form 21)
733	(8)	Summary of disbursements for family living (Page 29, Home Account book)

In planning and operating your farm business do you:

1. Study or refer to you Income and Expense Summary - 5 year record?  
 (Form 22) 83% 17% (percentage rating)  
 (No. rating 92) Yes or No - 18% (% rating) 19.7% 72.8%  
 If yes, (circle one) frequently, occasionally, seldom  
 7.5% (No. rating) 17 60 6

Outlook and marketing information (Number in their order of importance or use by you). (1-2-3-4)

(Final No. Rating)	Final Rank	
284	(3)	Marketing information for Kansas farmers-- Wheat outlook, Beef cattle outlook, etc. (issued monthly)
428	(4)	Kansas Agricultural Situation (issued monthly)
253	(2)	Weekly Market Comment, (accompanies fieldman's letter)
238	(1)	Fieldman's Weekly letter

Farm visits, advice and suggestion from the fieldman (number 1-2-3-4, in their order or value or benefit to you):

198	(1)	Advice on management problems - buying, selling, producing.
261	(2)	His suggestions for improving your business
415	(4)	His suggestions on use of credit
301	(3)	His guidance in posting income and expense items in your account book

The fieldman holds summary meetings each spring, presenting farm business analysis and home account summaries of your account book, to help you study your farm business and compare it with similar farms.

Do you attend these meetings regularly each spring? \_\_\_\_\_  
 76% - 24% (percentage rating)  
 (Yes or No). Please number the following in their order of importance or helpfulness to you. (1-2-3-4)

311	(4)	A study of your annual net worth statements for two or more years.
358	(3)	Comparison of your farm summary of receipts and expenses, by income groups, with other farms in your area.
257	(2)	Comparison of the Farm Management analysis on your farm with other farms in your area.
231	(1)	Comparison of your record this year (income and expense and analysis) against that of previous years.

The following are major items or general features of the educational program in farm management. Please number 1-2-3-4-5-6 in their order of importance or use by you.

291	(2)	Complete loose-leaf Farm and Home account book
331	(3)	Outlook and marketing information
251	(1)	Farm visits with the fieldman
403	(4)	Summary and analysis meetings
432	(5)	Special fall outlook meetings
	( )	Other (describe)_____

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List above any other item or general feature of the work which you consider important and rate it with those given.

List three recommendations which in your judgment would be most useful in improving the effectiveness of the Farm Management program.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Very truly yours,

H. C. Love  
 Extension Economist in  
 Farm Management

A PROGRAM OF FARM MANAGEMENT  
FOR EXTENSION

by

HAROLD CLYDE LOVE

B. S., Kansas State College  
of Agriculture and Applied Science, 1933

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A THESIS

submitted in partial fulfillment of the  
requirements for the degree

MASTER OF SCIENCE

Department of Economics and Sociology

KANSAS STATE COLLEGE  
OF AGRICULTURE AND APPLIED SCIENCE

## A Statement of the Problem

The scope of the program in farm management Extension work is so broad that two major difficulties or problems are always present to some degree in every state.

First because of this broad field the activities of an extension farm management worker tend to drift in one of two directions; either to a widely scattered effort with minor accomplishments, in several lines of educational work, or because of personal interests to concentrate the resources of time and energy on a particular phase of the work such as farm accounting and neglect other important and worthwhile parts of the field.

Second, the farm-as-a-unit approach used in farm management extension work brings economies into the field of the production specialists. This entry into the production specialists field brings conflict or cooperation and correlation of effort.

In studying these problems the literature of ancient and modern farm management was reviewed briefly. Examples of current farm management problems on Kansas farms were stated to further indicate the broad scope of the field. Next facts, principles, and sources of data for a farm management extension program were considered. The methods receiving current emphasis in farm management work in the thirteen North Central States was recently surveyed by a committee composed of extension economists in farm management in those states. The results of this survey are shown in detail and the most important parts are pointed out and discussed.

In an effort to learn what farm management association members in Kansas value most in their special program of farm management a ten percent random sample was drawn and surveyed by a questionnaire. The replies to this questionnaire are summarized, its results presented and a few observations are made.

Thermometer charts were studied in an effort to determine their value as an educational tool in teaching farmers how to improve their business. In making this study three representative farms were studied for the ten year period 1941 through 1950.

Farm management as a science is relatively new. The first major work was on cost of production studies in 1902. Its development has used farm cost routes, farm surveys, and questionnaires, summary and analysis of complete account books, special enterprise studies, case studies of individual farms and budget comparisons based on the best technical information from experiment stations and actual farm records as sources of data for research. Most of these same tools have been used by extension specialists in educational work in farm management. In the thirteen North Central States various phases of farm accounting and farm and home planning have received thirty-one and twenty-eight percent respectively of extension farm management specialists time. Farm management associations have been organized in Illinois, Iowa, Kansas, Wisconsin and Ohio, Minnesota, Missouri has Balanced Farming associations organized on a county basis. Association work in the United States is therefore concentrated in the North Central States.

The survey and research cited in this thesis were used as a basis for recommendations for changes or additions to the program of Extension Farm Management in Kansas. The most important recommendations are included in the following:

1. Obtain more physical measures of production in farm account books that are used for analysis and teaching purposes.
2. Establish more farm management demonstrations and hold field days on these farms to reach a greater number of farm families.
3. Bring to the people of Kansas research results obtained from sources other than farm account books and thus provide a broader and more balanced program.