

FARM INCOME OF YOUNG FARMERS ENROLLED  
IN FARM BUSINESS ANALYSIS

by

HAROLD DEAN KNEWTSON

B. S., Kansas State University, 1960

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A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

School of Education

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

1965

Approved by

  
Major Professor

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## CHAPTER I

### INTRODUCTION

#### I. DEVELOPMENT OF THE FARM BUSINESS ANALYSIS PROGRAM

Much has been written in regard to the development of a program of instruction in farm business analysis for young farmers. McKinsey showed that increases in agricultural productivity have been achieved with an actual decrease in labor input, fairly constant land input, but a tremendous increase in capital inputs.<sup>1</sup> As a result farms had to increase gross income about 2.5 per cent each year from 1955 through 1959 to maintain a constant net income. During this same time the general educational level and general level of living had been rising. Duis told of the need for farm business analysis and of its usefulness to farm families.<sup>2</sup> He also showed a cost of seventy cents for each dollar for gross income.

Anderson suggested that the entire farm should be considered during a period of instruction of at least three years.<sup>3</sup> The first year was used to accumulate records and teach the necessary accounting. Second and third year programs were used in Minnesota for analysis and farm planning. The instructor must have the confidence of the farmers and be able to motivate them to be part of the adult farmer program. To accomplish this Anderson

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<sup>1</sup>J. Wendell McKinsey, "How Socio-economic Change Affect Farm Life," American Vocational Journal, 37:26-27, February, 1962.

<sup>2</sup>H. F. Duis, "New Approach to Teaching Farm Management is Necessary," Agricultural Education Magazine, 36:51, September, 1963.

<sup>3</sup>G. A. Anderson, "Long-time Planning for Adult I, II, and III," Agricultural Education Magazine, 32:53-54, September, 1959.

raised the question of reducing the time with all day classes to give more time to farmers who are actually in the business.

Circular No. 752 devoted entirely to the farm business analysis program on a national level.<sup>4</sup> The forward included the following statements.

This publication, designed for persons who have responsibilities for the administration and operation of vocational agriculture programs, is intended primarily as a guide to aid supervisors, teacher trainers, and teachers of vocational agriculture in planning and conducting more effective farm management programs. Emphasis is given to those practices and procedures considered essential in providing the type of instruction needed by present day farmers.<sup>5</sup>

The first part described the complexity of the modern farm business enterprise and the type of farmer needed for tomorrow's agriculture. It was stated that, "A shift to the farm business analysis approach in teaching vocational agriculture is essential and one which will make a great contribution to agriculture in the years ahead."<sup>6</sup>

In the second part the objectives, methodology, and analysis procedures were outlined. It was reported that, "Net farm income is one of the most significant measures of return to the operator and his family for their labor, management, and capital."<sup>7</sup>

The concluding part outlined the program development from the state level to the vocational agriculture department in a local community. The

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<sup>4</sup>United States Department of Health, Education, and Welfare, Farm Business Analysis, Guidelines for a Suggested Program in Farm Management, OE-81010, Circular No. 752 (Washington: United States Government Printing Office, 1964).

<sup>5</sup>Ibid., p. v.

<sup>6</sup>Ibid., p. 3.

<sup>7</sup>Ibid., p. 8.

use of resources and the training of teachers was also explained. According to the authors the teacher of vocational agriculture is the logical person to accept the task of providing a well-organized farm business analysis program which will contribute to the success of young farmers in the community.<sup>8</sup>

Curtis stated that the vocational agriculture teacher should know each man's farm business intimately.<sup>9</sup> He wrote of success in helping farmers by establishing record keeping systems and by providing instruction in farm business analysis. He also reported teachers in Pennsylvania had developed an electronic accounting system and farm records designed to serve a useful purpose in farm business analysis.

Scarborough, in stressing the need of teacher time for farm management, pointed out the need of daylight time for follow-up and instruction.<sup>10</sup>

Yeatts stated that young farmers can benefit most from farm business analysis because they are, ". . . young enough to be receptive to new ideas, but old enough to put these ideas to use on their farms."<sup>11</sup>

## II. NEED OF STUDY

In the summer of 1962 a course of instruction for teaching farm business analysis to young farmers in Kansas was developed by a group of vocational

<sup>8</sup>Ibid., p. 19.

<sup>9</sup>Samuel M. Curtis, "Summer Assistance for Adult Farmer," Agricultural Education Magazine, 37:304-5, June, 1965.

<sup>10</sup>C. Scarborough, "Farm Management for Whom?" Agricultural Education Magazine, 36:54-55, September, 1963.

<sup>11</sup>A. L. Yeatts, Jr., "Look to the Young Farmers," American Vocational Journal, 36:12-13, January, 1961.



agriculture teachers under the direction of Agan<sup>12</sup> and Eustace.<sup>13</sup> In the summer of 1963 and 1964 two additional groups of vocational agriculture teachers were given instruction in teaching the farm business analysis course to young farmers.

A group of fifty young farmers from ten vocational agriculture departments were given the first year of instruction in 1963 and received additional training in 1964. A second group of fifty-seven farmers began training in 1964.

As this program has developed two problems have evolved. First, young farmers had to be motivated to take the time necessary to keep extensive records for analysis of their farm business. Second, the program called for considerable time and effort on the part of the local vocational agriculture teacher. It was felt by the writer that if this program was to continue the teacher's time and salary need to be justified as public school expense.

It was felt that research in this area would help answer the above problems. If instruction in farm business analysis could be shown to be in direct relationship to increased farm income this could then be used as a motivating factor for new class members. If increased farm income should result in an improved standard of living in the community where such instruction is given, the increased standard of living would justify the cost of the program.

It was also felt by the writer that this study was timely as some of

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<sup>12</sup>Raymond Agan, Head Teacher Trainer in Agriculture Education, Kansas State University, Manhattan, Kansas.

<sup>13</sup>C. C. Eustace, State Supervisor for Vocational Agriculture, State Board for Vocational Education, Topeka, Kansas.

the area vocational technical schools were also considering the inclusion of this course as part of their curriculum.

### III. STATEMENT OF PROBLEM

The problem was to determine if the rate of change in farm income of young farmers in Kansas was accelerated during the time they received instruction in farm business analysis. The rate of change was determined for a group of young farmers receiving instruction in farm business analysis, for the farm management associations cooperating with the Kansas State University Extension Service, and for the entire state as reported by the Kansas Crop and Livestock Reporting Service. Analysis of variance and the t Test were used to determine the significance of the observed changes in farm income.

### IV. HYPOTHESIS

The hypothesis was that the rate of change of farm income for farm business analysis class members, farm management association members and the state net farm income per farm would vary at constant independent rates.

### V. DEFINITION OF TERMS

Farm business analysis. The term farm business analysis for the purpose of the study referred to the general procedure for teaching of farm management as outlined in, "Teaching Farm Business Analysis in Programs of Vocational Agriculture for Young Farmers in Kansas Communities."<sup>14</sup> The

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<sup>14</sup>C. C. Eustace, and Raymond J. Agan, "Teaching Farm Business Analysis in Programs of Vocational Agriculture for Young Farmers in Kansas Communities" (The State Board for Vocational Education, Topeka, Kansas, July, 1962).

process was defined as follows:

The process of teaching farm business analysis to young and/or adult classes in Vocational Agriculture was interpreted as a three-year program where teachers of Vocational Agriculture work closely with a small selected group of farmers and their wives in order to analyze the management practices and production factors of the farm business and make adjustments for the maximum profit possible from the farm. The process centers about the keeping of adequate farm business records, their interpretation and analysis.<sup>15</sup>

Young farmer. The term young farmer referred to any person in the process of becoming an established farmers. Young farmers were not necessary enrolled in a vocational agriculture class. The term could be contrasted with "adult farmers" that are well established in the business of farming. The actual age of the farmer had nothing to do with the classification.

Farm income. Throughout the report of this investigation the term "farm income" was interpreted as income from capital and operator's labor (receipts and increase in inventory, less expenses, depreciation of machinery, and depreciation of farm improvements.) This is what was left to pay for the farmer's time and for the use of invested capital. The term farm income was also called net farm income.

Farm management associations. The term "Farm management associations" for the purpose of this study referred to all six area farm management associations cooperating with the Kansas State University Extension Service. This program was developed in response to requests by farmers for assistance and instruction in keeping farm records and in using them to find ways to

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<sup>15</sup>Ibid., p. 2.

improve their farm business.<sup>16</sup>

State net farm income. For the purpose of this study the term "state net farm income" referred to the realized net income per farm in dollars as reported in Kansas Agriculture.<sup>17</sup>

#### VI. LIMITATIONS

The study was limited to young farmers currently enrolled in farm business analysis classes and to data obtained from farm management associations and Kansas State Board of Agriculture reports. Farm business analysis classes were offered only in communities offering vocational agriculture and many of the young farmers may have received prior training in these classes.

Due to time and money available the farm business analysis group was limited to fifty young farmers. This group was selected by a random sample technique. The study was also limited to those young farmers that were willing to make their farm records available and to supply the requested inventory information.

The review of literature was limited to the material contained in Farrell Library at Kansas State University and Porter Library at Kansas State College of Pittsburg. There were several studies of possible importance not cited due to this limitation and the difficulties involved in securing details of these studies.

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<sup>16</sup>J. H. Coolidge, "Farm Management Summary and Analysis Report," (Extension Service, Kansas State University, Manhattan, Kansas, 1963), p. 2.

<sup>17</sup>Statistical Division of the Kansas State Board of Agriculture, Kansas Agriculture: 1963 1964. 47th Report, (Topeka: State Printer, 1964), p. 89F.

The study was conducted at the end of the second year of instruction in farm business analysis. As a result no attempt was made to show the total effect of the program as the first group of young farmers had not yet completed the third year.

#### VII. REVIEW OF SELECTED LITERATURE

Much has been written on the need of farm business training for farmers, however the development of programs of instruction for farm families through vocational agriculture departments has been rather slow. The first farm business analysis classes in Kansas were organized in the fall of 1962. Some work has been done in other states in determining the effectiveness of similiar training offered to farm families. A brief summary of work done on problems closely related to the one at hand will be given here.

Selected literature on factors related to net farm income. Saupe, in his study to identify relationships found in the analyses of farm records that could be used as management guides, found several measures of farm business to correlate with net farm income.<sup>18</sup> This study indicated the operator's net farm income and operator's labor and management returns were nearly identical measures of annual financial achievement. The operator's net farm income was highly correlated with several measures of volume of business, but with few measures of efficiency of business.

Saupe's study reported no correlation between the years of school completed and operator's net farm income. Total acres farmed was the most

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<sup>18</sup>William E. Saupe, "Farm Record Analysis as a Source of Farm Management Guides," Argricultural Education Magazine, 34:272, June, 1962.

important variable affecting farm income. The effect of operating a large farm tended to cover up the advantages of educational achievement. Another possible explanation was given, that the advantages of educational achievement appear over a period of time, and since these were beginning farmers, these advantages had not yet appeared.

Peterson pointed out that for every farmer there are six to eight technicians, distributors, processors, suppliers, and servicemen.<sup>19</sup> He stressed that these are all potential resource people for adult education and that the agriculture department should coordinate all agricultural education in the community.

Peterson indicated farming decisions should come from analysis of carefully kept records.<sup>20</sup> He listed six factors influencing profits from farming. The factors included price relationships, size of business, rate of production, labor efficiency, combination of enterprises and capital efficiency.

Carlson in an article describing the use of electronic accounting systems for whole farm accounting reported computer accounting costs to be about one percent of gross farm income.<sup>21</sup> In regard to costs he also reported, "as farmer Joe Galleano says, 'Any operation that's losing money is costing a farmer more than adequate records could possibly cost.'"<sup>22</sup>

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<sup>19</sup>Milo J. Peterson, "Profit is the Goal of Adult Farmer Teaching," Agricultural Education Magazine, 36:182-4, February, 1964.

<sup>20</sup>Ibid.

<sup>21</sup>Jerry Carlson, "What Computers Are Ready to Do for You," Farm Journal, 89:21-23, July, 1965.

<sup>22</sup>Ibid., p. 23.

Fidler suggested the need of programs to meet the needs of farmers on an interest basis.<sup>23</sup> He stated that young farmers and their wives could be enrolled in a year-to-year program designed to help obtain their long time goals.

Marvin, concerned with stimulating farmers to use farm business analysis, pointed out that without records one would be without information for analysis, without analysis one could not use the information for interpretation, and without interpretation no decisions to improve the enterprise would be made.<sup>24</sup>

Selected literature on establishment in farm business. Lester interviewed 100 young farmers in Missouri to determine personal characteristics, sources used in accumulating initial assets, and the farm status classifications used in establishing the farm business.<sup>25</sup> Twenty five men in each of four districts were selected at random.<sup>26</sup> The major success factors in the opinion of the young farmers were accessibility to the family farm, use of family owned equipment, educational assistance, and non-family credit.

Lester's study showed a positive relationship between number of years

<sup>23</sup>Lloyd B. Fidler, "More Effective Young and Adult Farmer Courses," Agricultural Education Magazine, 33:45-46, August, 1960.

<sup>24</sup>Paul R. Marvin, "Farm Business Analysis Can Be Taught," Agricultural Education Magazine, 36:57-58, September, 1963.

<sup>25</sup>Herschel T. Lester, Jr., "Establishing Young Men in a Farm Business," Agricultural Education Magazine, 34:42-44, August, 1961.

<sup>26</sup>Herschel T. Lester, Jr., "How Young Men in Missouri Communities Served by Vocational Agriculture Start and Progress in Farming," Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, Inc., 1961) 22:2614.

the young farmers had farmed and farm income.<sup>27</sup> His conclusions were that the young farmers have need of and will avail themselves of instruction and information which contributes to successful operation of their business.

Edington studied 192 young dairy farmers in an attempt to establish criteria for predicting the success of Pennsylvania young farmers in farm management.<sup>28</sup> Ten characteristics were measured and the scores correlated with success in farm management. Success in farm management was measured in terms of production efficiency, pounds of milk sold per operator, crop production, labor efficiency, and net farm income.

The group was divided into multiple teacher departments and single teacher departments, into groups receiving high and low levels of instruction, and into groups having high and low levels of responsibility.

Both interview and group testing procedures were used. The scores were tested at the .05 level of significance by analysis of covariance, correlation and multiple regression. It was found that no significant differences occurred in the means of the five criteria measured between multiple and single teacher departments. Significant differences for success in farm management were found in knowledge of farm management measured on a farm management test, in scores on an approved practice rating scale, and in years as a 4-H club member. A significant positive correlation was found with community participation and all areas except crop production. Years of

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<sup>27</sup>Lester, loc. cit.

<sup>28</sup>Everett D. Edington, "Abilities and Characteristics of Young Adult Dairy Farmers in Pennsylvania Which are Associated with Successful Farm Management," Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, Inc., 1962) 22:3791-2.



formal schooling had a significant positive correlation with pounds of milk sold, production efficiency, and crop production. Mechanical aptitude had a significant positive correlation with pounds of milk produced per operator.

When regression analysis was applied to the high responsibility group the number of years in young farmer classes showed a negative correlation which was significant. It was concluded that this indicates young farmer instructors are reaching a different type of farmer and that those entering young farmer classes are some of the more successful farmers.<sup>29</sup>

#### VIII. SUMMARY

Several writers have pointed out the increasing complexity of the farm business and the need for training of young farmers in techniques of farm business analysis. Several states have developed programs to provide this training. Most of the programs were similar to the three year method used in Minnesota and to the structure outlined by the United States Department of Health, Education and Welfare.

Some factors affecting net farm income have been indicated in certain studies. Size of operation affected the net farm income more than the age of the operator or the educational status. The number of years of experience in farming increased the net income. The number of teachers in the department made no difference in one study. One study showed farm management success was affected by knowledge of farm management, use of approved practices, 4-H experience, community participation, and formal

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<sup>29</sup>Everett D. Edington, "Predicting the Success of Pennsylvania Young Farmers in Farm Management," Agricultural Education Magazine, 34:61-62, October, 1962.

schooling. Labor and management were important indicators.

The importance of the teacher using time to reach young farmers actually in the business was stressed by some of the authors. Several authors drew the conclusion that the young farmers who are more successful seek instruction and information.

## CHAPTER II

## RESEARCH DESIGN

In order to determine if the rate of change in farm income of young farmers in Kansas was accelerated during the time they received instruction in farm business analysis the following procedure was developed. The change in farm income of three groups of farmers; randomly selected farm business analysis class members, the farm management association members, and the total of all farmers in the state reporting farm income, was determined for each of the five years, 1960 through 1964. Analysis of variance was then used to determine the significance of the changes in farm income. The t Test was used when necessary to indicate the group mean responsible for any significant variances.

## I. DESCRIPTION OF THE POPULATION

Farm business analysis. This population consisted of the young farmers enrolled in farm business analysis classes taught by vocational agriculture teachers as part of the vocational agriculture program offered in local high schools. A list of all the names of those completing farm business analysis classes in 1964 was obtained from Eustace<sup>1</sup> and a table of random permutations<sup>2</sup> was used to select the sample of fifty young farmers. This list secured from Eustace indicated 107 young farmers from seventeen vocational agriculture

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<sup>1</sup>C. C. Eustace, State Supervisor for Vocational Agriculture, State Board for Vocational Education, Topeka, Kansas.

<sup>2</sup>Lincoln E. Moses and Robert V. Cokford, Tables of Random Permutations, (Stanford University Press: Stanford, California, 1963), p. 128.

departments in farm business analysis. The sample included at least one farmer from each of the seventeen vocational agriculture departments.

A letter was written to the vocational agriculture teacher of each of the fifty selected young farmers. The teachers made the initial contact and scheduled an interview with each of the selected young farmers.

The interviews were conducted in May and June of 1965. One young farmer brought his records to the local vocational agriculture department and the interview was conducted there. All other interviews were conducted in the home or office of the young farmer being interviewed. In three cases the young farmer was not available and the information requested was supplied by young farmer's wife.

Nine of the young farmers were eliminated from the sample by expressing a desire not to reveal their farm records to the researcher. One young farmer was not interviewed at the request of his vocational agriculture teacher. In the opinion of the teacher the farm operator was not typical of others in the class. Two young farmers were not interviewed due to scheduling conflicts.

Of the thirty-eight interviewed two had inadequate records for the study. Of the thirty six used in the study some had not kept complete records or the records had been lost for one or two years of the five year period. Only in 1964 was data available on all thirty-six young farmers.

The number of farms used for the study each year was:

Years	1960	1961	1962	1963	1964
Number of Farms	31	32	30	34	36

In 1964 the young farmers studied were farming an average of 495 acres each. The number of acres operated in other years was not determined.

Thirty-three of the young farmers were married at the time of the interview. Their family size ranged from two to fourteen. The five unmarried young farmers lived with their parents. All five had business-like arrangements or partnerships and only their share of the farm income was used in the study.

Thirty-three of the thirty-six young farmers studied were high school graduates. Three had completed only the eight elementary grades or had dropped school before completing their high school work. High school graduation dates ranged from 1929 to 1963. The mean graduation date was 1951 which would indicate the mean number of years out of high school was thirteen. The median high school graduation date was 1954 which would indicate the median number of years out of high school was ten years. These figures were not used to determine years of farming experience as some of the young farmers had served a term with the armed forces or had been employed in another occupation.

Of the thirty-three high school graduates included in the study twenty five had taken vocational agriculture while in high school. Only one of the remaining eight not enrolling in high school vocational agriculture attended a high school offering vocational agriculture at the time they were in school. Several of the young farmers had received instruction in young farmer classes and at least one had served as an officer in the Kansas Young Farmer Association.

Eighteen young farmers had received two years of instruction in farm business analysis and eighteen had participated in the program only in 1964. The young farmers were widely distributed in the state. At least one class was located in each of the seven vocational agriculture districts.

The net farm income determined for each farmer was rounded off to the nearest one thousand dollars and plotted on Table I. The farm incomes of individual farms varied greatly from year to year. The high or low farm was

TABLE I  
 TABLE OF FREQUENCIES OF NET FARM INCOME BY YEARS  
 FOR YOUNG FARMERS RECEIVING TRAINING  
 IN FARM BUSINESS ANALYSIS

NET FARM INCOME IN THOUSANDS	YEARS				
	1960	1961	1962	1963	1964
23				1	
22					
21				1	
20					
19					
18		1			
17					
16				1	
15				1	
14					
13					
12	1				2
11					1
10		3			1
9			2		
8	1	1	2	1	2
7		1	2	3	4
6	2	2	3	3	2
5	2	2	2	2	2
4	3	3	2	2	3
3	2	3	2	6	3
2	3	6	8	3	5
1	8	6	6	3	5
0	7	1		3	3
-1	1			3	2
-2		2			1
-3	1			1	
-4		1	1	1	
TOTAL EACH YEAR	31	32	30	34	36

not the same farm in any consecutive year.

State average group. Statistical figures published by the Kansas State Board of Agriculture<sup>3</sup> were used to establish the state average group for comparison. All data for this group was compiled by the Kansas Crop and Livestock Reporting Service. The average number of acres per farm in 1964 was 494 and there were 101,000 farms. The average farm size and number of farms reported each year was listed in Table II. Only the net income per farm figures for the years 1960 through 1964 were used in this study.

The total farm marketings were lowest in 1960 with a steady increase through 1963.<sup>5</sup> A slight decrease was reported in 1964. The total receipts and total payments followed the same trend, however, all five years were higher than any previously reported year in the thirty-six year history.

TABLE II  
NUMBER OF FARMS AND ACRES PER FARM  
FOR THE STATE AVERAGE GROUP<sup>4</sup>

YEAR	NUMBER OF FARMS	ACRES PER FARM
1960	110,000	456
1961	107,000	468
1962	105,000	477
1963	103,000	485
1964	101,000	494

<sup>3</sup>Statistical Division of the Kansas State Board of Agriculture, Kansas Agriculture: 1963 1964. 47th Report, (Topeka: State Printer, 1964), p. 89F.

<sup>4</sup>Ibid.

<sup>5</sup>Ibid.

Farm management group. Farm management figures were taken from the Farm Management Summary and Analysis Report<sup>6</sup> provided by Coolidge. Fieldmen in each of the six associations analyzed the farm records and prepared summary reports. The number of farms included in the summary increased each year to a total of 1,892 in 1964. The number of farms summarized each year was:

YEAR	1960	1961	1962	1963	1964
NUMBER OF FARMS <sup>7</sup>	1,573	1,617	1,669	1,755	1,892

The mean farm size in 1963 for the farm management group was 1.152 acres. The number of operators per farm was 1.72. The number of acres per operator was 669.

## II. DESIGN OF INTERVIEW

An interview with each young farmer in the farm business analysis group was used to secure the information needed for this study. Farm income was determined on the accrual basis for the years 1960 through 1964. A standard procedure was used for determining the value of inventoried items. Appendix A contains a table of values used for inventoried items.

Records were taken from the Kansas Farm and Household Account Book for the years it had been used. In those cases where a different account book or no account book had been used the records kept for the purpose of income tax reporting were used to determine sales and purchases in each year.

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<sup>6</sup>J. H. Coolidge, "Farm Management Summary and Analysis Report," (Extension Service, Kansas State University, Manhattan, Kansas, 1963).

<sup>7</sup>Ibid.



During the interview the receipts and expenses and the farm inventory of livestock, grains and feeds, machinery, and permanent improvements were recorded for all inventoried items. Only incomes and expenses incurred from the farm operation were used in determining farm income. The value of the ending inventory was added to the receipts to give total credits. The beginning inventory was added to purchases to give total debits. The difference between credits and debits was gross farm income.

A standard depreciation schedule was used for all purchases breeding livestock, machinery, and permanent improvements. Appendix A contains a copy of the depreciation schedule used. The depreciation in each year was added to other expenses to give total farm expenses. The total farm expenses were subtracted from gross farm income to give farm income.

Size of farm in acres, marital status, high school graduation date, and vocational agriculture training received were also determined during the interview. Appendix B contains a copy of the interview and procedure used to determine farm income.

### III. ANALYSIS OF DATA

The mean farm income for each group for each year was plotted on a graph in Figure 1 on page 29. The portion of the curve for the years 1960, 1961, and 1962 was used to establish a pattern before farm business analysis training was offered. The portion of the curve for 1963 and 1964 was used to show the incomes after farm business analysis instruction was offered. Only the differences in the curves occurring in 1963 and 1964 were interpreted by the researcher to indicate a possible change due to farm business analysis training.

Analysis of variance and the t Test were used to compare the mean farm incomes of each group for the years 1960 through 1962. All data were tested at the .05 level of significance. A calculating machine was used for most of the statistical tests. It was assumed by the researcher that the mean farm income of each group should change at a constant, but independent rate.

The rate of change in farm income for 1960 through 1962 was figured for each group to establish the pattern of change before farm business analysis was offered. The actual change in farm income for the years during training was compared to the predicted change based on years 1960 through 1962. The difference between actual change in farm income and predicted change in farm income was determined for each group. Figure 2 on page 34 was used to show the changes in income in graph form. Figure 3 on page 36 was used to show the variances from the predicted income based on 1960 through 1962 farm income. These differences were then tested at the .05 level of confidence by analysis of variance and the t Test to determine the significance of the change in farm income. Significant differences in farm income beyond the predicted changes were assumed to be the result of training in farm business analysis.

The researcher was aware of the wide range of variables affecting farm income and of the possibility of error in determining farm income on an accrual basis. Prices received for products sold, prices paid for supplies and machinery, climatic conditions, location in the state, participation in government programs, size of farm, ability of the farmer, and many other factors would have influenced farm income. No attempt was made to eliminate these factors. All three groups were selected from populations widely

dispersed over the state. The researcher assumed these factors affecting farm income would have influenced each group to a similar degree.

Farm business analysis training was given to one group in 1963 and 1964 through their local vocational agriculture departments. The age, farm size, previous training, and other factors may have varied significantly for this group. To correct for this possible variance the farm incomes were tested by analysis of variance for significant differences in the years before training was given.

The farm management group had also received instruction and assistance in managing their farms from the farm management fieldmen. Farms in both the farm management and farm business analysis group would have been included in the state net farm income group. Together they represented about 2 per cent of the farmers in the state net farm income group.

For the purpose of the study the accrual basis net farm income figures from the Farm Management Summary and Analysis Report<sup>8</sup> and the realized net income per farm figures from the Kansas State Board of Agriculture<sup>9</sup> were considered acceptable by the researcher.

A standard set of inventory values and a standard depreciation schedule were used by the researcher in determining the net farm income for the farm business analysis group. Copies of these schedules were included in Appendix A. No attempt was made to insure uniformity in data collecting techniques between the three groups. However, it was assumed by the author that adequate

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<sup>8</sup>J. H. Coolidge, "Farm Management Summary and Analysis Report," (Extension Service: Kansas State University, Manhattan, Kansas, 1963).

<sup>9</sup>Statistical Division of the Kansas State Board of Agriculture, Kansas Agriculture: 1963 1964. 47th Report, (Topeka: State Printer, 1964), p. 89F.

precautions had been taken to assure uniformity of data collecting techniques from year to year within each group.

In the planning stages of this study a somewhat different procedure was tried and abandoned. An attempt was made by the researcher to secure data from a group of young farmers without farm business analysis training that were graduating vocational agriculture classmates of the selected group with farm business analysis training. The names were obtained during the interview with the farm business analysis group. The thirty-eight young farmers interviewed reported only thirty-one graduating vocational agriculture classmates that were farming in their communities at the time of the interview. Due to the difficulty encountered in locating these young farmers, the time and expense involved in making a second trip to conduct the interview, and the lack of willingness of some of these farmers to make records available this procedure was determined not feasible by the writer.

## CHAPTER III

## PRESENTATION AND ANALYSIS

Thirty-six young farmers selected at random from a list of young farmers enrolled in farm business analysis classes were interviewed and their net farm income for the years 1960 through 1964 determined. The mean net farm income of farm management farms and the state average net farm income per farm was determined. Appendix B contains a copy of the interview sheet and procedure used to collect data.

Eighteen of the thirty-six farmers in the farm business analysis group had received farm business analysis instruction in 1963 and all thirty-six farmers had received training in 1964. The data were analyzed to determine significant changes in the rate of change of farm income during 1963 and 1964.

## I. PRESENTATION OF DATA

Farm business analysis group. Table I was developed to show the frequency of net farm income on an individual farm basis for each of the five years studied. Farm incomes were grouped in units of one thousand dollars each. No attempt was made to identify individual farms or to follow the change in farm income on individual farms. The individual incomes varied from a high of \$22,749 for one farm in 1963 to a loss of \$4,257 for one farm in 1961. Records were not available in some isolated years for some of the farmers interviewed.

The farm income was obtained from thirty-one farms in 1960 and the mean farm income was \$2,241.45. All incomes were rounded to the nearest dollar

for analysis procedures. In 1961, thirty-two farms were included with a mean farm income of \$3,685. This was an increase of \$1,444 over the previous year.

In 1962, thirty farms were used and the mean farm income was \$3,626 for a loss of fifty-nine dollars from the previous year. Records were available from thirty-four farms in 1963 and the mean farm income was \$4,448 representing a gain of \$882 over the previous year. The mean farm income was lowered to \$3,953 in 1964 by a \$495 reduction from 1963. The mean farm income and number of farms included each year are recorded in table form in Table III.

The largest gain for the farm business analysis group was in 1961 and the largest loss was in 1964. The mean farm income for the five year period was \$3,591. The rate of change for 1960 through 1962 was a gain of \$693 per year. The rate of change dropped to a gain of \$164 during the 1962 through 1964 period.

Farm management group. Data for the farm management farms was taken from the Farm Management Summary and Analysis Report.<sup>1</sup> The number of farms increased from 1,573 in 1960 to 1,892 in 1964. The net farm income at \$7,885 in 1960 was more than three times higher than the farm business analysis group income for the same year. A total of \$7,374 was recorded in 1961 as a result of a loss of \$511. A substantial gain of \$1,129 was reported in 1962 to bring the net farm income to \$8,503. This was record high for the farm management associations.

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<sup>1</sup>J. H. Coolidge, "Farm Management Summary and Analysis Report," (Extension Service: Kansas State University, Manhattan, Kansas, 1963).

In 1963 the farm income was \$4,731 a drop of \$3,772 from the 1962 high. A gain of \$174 in 1964 brought the final farm income figure for the farm management group to \$4,905. The 1964 income was \$3,598 below the 1962 high. The largest gain was in 1962. Data concerning the farm management group is summarized in Table III.

The mean income for the five year period was \$6,680. The rate of change was a gain of \$309 per year for the period of 1960 through 1962. The rate of change during the last two years of the study was a loss of \$1,799 per year.

State average income per farm group. Data for the state average group was taken from the Kansas State Board of Agriculture.<sup>2</sup> The number of farms in this group was much larger than in the other groups studied. The number decreased from 110,000 in 1960 to 101,000 in 1964.

The realized net farm income increased during the first half of the study and then began a downward trend. The farm income was \$3,384 per farm in 1960, \$4,384 per farm in 1961, \$4,827 in 1962, \$4,256 in 1963, and \$3,746 per farm in 1964. The changes were a gain of one thousand dollars in 1961, a gain of \$443 in 1962, a loss of \$571 in 1963, and a loss of \$510 in 1964. Data relating to the state average group is also summarized in Table III.

The mean farm income for the state average group was \$4,119 for the five years studied. The rate of change was a \$722 gain for the years 1950 through 1962. A loss of \$541 per year was reported for the period 1962 through 1964.

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<sup>2</sup>Statistical Division of the Kansas State Board of Agriculture, Kansas Agriculture: 1963 1964. 47th Report, (Topeka: State Printer, 1964), p. 89F.

TABLE III  
 NUMBER OF FARMS AND MEAN NET FARM INCOME  
 FOR EACH FARM FOR EACH YEAR STUDIED

YEARS	FARM BUSINESS ANALYSIS		FARM MANAGEMENT <sup>a</sup>		STATE AVERAGE <sup>b</sup>	
	Number of Farms	Mean Net Farm Income	Number of Farms	Mean Net Farm Income	Number of Farms	Mean Net Farm Income
1960	31	\$2,241	1,573	\$7,885	110,000	\$3,384
1961	32	3,685	1,617	7,374	107,000	4,384
1962	30	3,626	1,669	8,503	105,000	4,827
1963	34	4,448	1,755	4,731	103,000	4,256
1964	36	3,953	1,892	4,905	101,000	3,746

<sup>a</sup>J. H. Coolidge, "Farm Management Summary and Analysis Report," (Extension Service: Kansas State University, Manhattan, Kansas, 1963).

<sup>b</sup>Statistical Division of the Kansas State Board of Agriculture, Kansas Agriculture: 1963-1964. 47th Report, (Topeka: State Printer, 1964), p. 87F.



## II. ANALYSIS OF DATA

Five year net farm income. Figure 1 was developed to show the mean net farm income of each group for each year. The farm incomes for each group for the five years were tested by analysis of variance to determine if significant differences existed between the three groups. A summary of the test follows:

SOURCE	SUMS OF SQUARES	df	MEAN SQUARE	F
Between groups	27,293,625	2	13,646,812.50	10.11
Within groups	16,193,879	12	1,349,489.92	

A table<sup>3</sup> of F was used and the difference was found to be significant at both the .05 and .01 levels of confidence.

The t Test was then used to test the groups two at a time. At of 1.18 with eight degrees of freedom resulted when the farm business analysis group and the state average group was tested. A table<sup>4</sup> for the critical value of t was used and no significant difference was found between these two groups.

A t value of 3.12 with eight degrees of freedom for the test of the farm management group and the state average group was found to be significant at the .05 and .02 levels of confidence, but not significant at the .01 level.

A t value of 3.58 with eight degrees of freedom for the test of the farm management and farm business analysis group was found to have a significant difference in the means at both the .05 and .01 levels of confidence.

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<sup>3</sup>Deobold B. Van Dalen, Understanding Educational Research (New York: McGraw-Hill Book Company, 1962), p. 390.

<sup>4</sup>Ibid., p. 387.

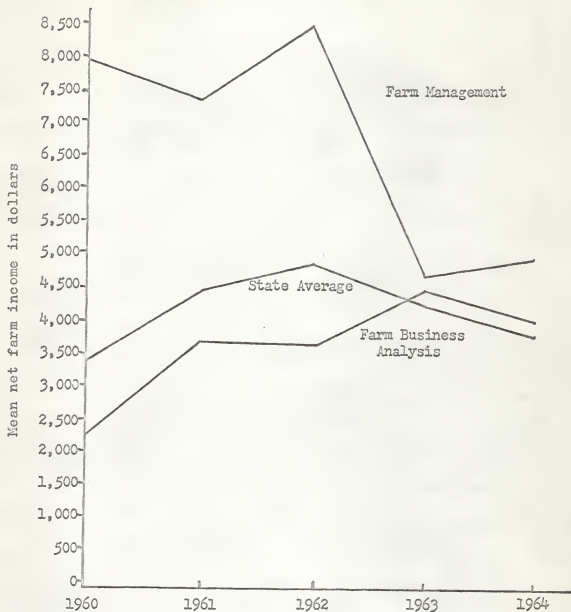


FIGURE 1

MEAN NET FARM INCOME IN DOLLARS FOR  
 THE FARM BUSINESS ANALYSIS GROUP,  
 THE FARM MANAGEMENT GROUP, AND  
 THE STATE AVERAGE GROUP

It was concluded by the researcher that the state average group and the farm business analysis group could be used for further testing in this study. The fact that their farm incomes did not vary significantly was interpreted to be an indication that the groups had been effected similarly by most of the factors affecting net farm income.

It was also concluded by the researcher that net income of the farm management group could not be used to compare with either the state average group or the farm business analysis group. It was assumed by the researcher that some factor other than the experimental variable had influenced farm income of the farm management group. The researcher assumed this variance to be due to the 44 per cent decrease in farm income in 1963 and to only a two per cent recovery in 1964. The state average group declined only 11.9 per cent in 1963 and the farm business analysis group had a 22.8 per cent gain. The exact cause of this decline in farm income was beyond the design of this study. However, the researcher offers the following explanation bases on data accumulated for the study.

The mean farm size of the farm management farms was 1,152 acres in 1963 compared to 495 acres for the farm business analysis group and 494 acres for the state average group. The two western farm management associations reported a 67 per cent decrease in farm income in 1963 while the four eastern two thirds reported only about a 35 per cent decrease in farm income. If a larger proportion of the farm management farms were located in the western part of the state as compared to the other group, the location and rainfall might have influenced the net farm income. Since farm size was larger it would seem logical to the researcher to expect more of the farms to be located in dryland farming areas.

Coolidge explained that the drop was a reflection of actual lower crop yields, the drop in cattle prices, and the lower inventories of crops and livestock at the end of 1963.<sup>5</sup> If lower inventory values were used this might result in lower farm incomes in some years as uniform values were used for all years in collecting data for the farm business analysis group.

Net farm income before and after. The net farm income figures were then divided into a group including the years 1960, 1961 and 1962 and a group including the years 1963 and 1964. Each of these groups was then tested by analysis of variance to strengthen the premise that no significant differences existed before 1963 and to check the possibility of a significant variance after farm business analysis instruction was offered. Data used for this test were taken from Figure 1. A summary of the test for F follows:

SOURCE	SUMS OF SQUARES	df	MEAN SQUARE	F
Between groups	37,688,776	2	18,844,388.00	36.86
Within groups	3,067,676	6	511,279.33	

Reference to a table for distribution of F revealed a significant difference at both the .05 and .01 levels of confidence.

The t Test was used and a t score of 1.59 with four degrees of freedom was found for the state average and farm business group. The table of critical values of t indicated no significant difference in the means at the .05 level of confidence.

A t score of 8.92 was found for the test of the state average group and

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<sup>5</sup>J. H. Coolidge, "Farm Management Summary and Analysis Report," (Extension Service: Kansas State University, Manhattan, Kansas, 1963).

the farm management group. The farm management group and the farm business analysis group were tested and a t score of 8.26 was found. Both scores were checked at four degrees of freedom and their means found to have a significant difference at the .05 and .01 level of confidence.

It was concluded by the researcher that since the net farm income of the state average group and the farm business analysis group had not varied significantly in either the five year or the three year test, they could be expected to show no significant difference in the last two years.

It was also concluded that the farm income from farm management farms could not be compared with farm income of either of the other groups as a significant variance had resulted in both the five year and the three year test.

The F Test was then applied to the three groups using farm income figures for 1963 and 1964. A summary of the test follows:

SOURCES	SUMS OF SQUARES	df	MEAN SQUARE	F
Between groups	725,730	2	362,865.00	3.78
Within groups	287,701	3	95,900.33	

Entering the table for the distribution of F with the appropriate degrees of freedom resulted in a non-significant difference among the farm incomes of the three groups studied for the years 1963 and 1964. The researcher concluded that no significant change in net farm income had occurred due to farm business analysis training. A significant decline was observed in the farm income of the farm management group as discussed earlier in this chapter.

It was also observed by the researcher that farm income increased for all groups in the years 1960 through 1962 and that income continued to

increase for only the farm business analysis for the years 1962 through 1964. In 1963 the farm income for the farm business analysis group came from \$1,201 behind the state average income to \$192 above it and maintains this same relative position in 1964. See Figure 1, page 29. It must be pointed out that these changes were not significant at the .05 level of confidence.

The writer deemed it necessary to point out that farm income for the farm management group was significantly higher than either of the other groups in the years 1960 through 1962. This was shown by the three year t Test score of 8.72 and 8.26. The exact cause of the drop to a not significantly different level in 1963 and 1964 was not shown by this study. However it was of interest to note that in only one year (1963) was farm management income as low as the highest year (1962) for the state average group and that at no time was the farm management income as low as the highest year (1963) for farm business analysis.

Five year rate of change. Figure 2 was developed to show the rate of change in farm income. The year 1960 was used as a base year and the change in farm income for each consecutive year was plotted from a zero point in 1960. This figure shows only the rate of change in income since 1960 and does not represent the total income earned in any year. Only four entries appear for each group as only four changes may occur in a five year period.

The rate of change in farm income for the three groups for the five year period was tested by analysis of variance. A summary of the F Test follows:

SOURCE	SUM OF SQUARES	df	MEAN SQUARE	F
Between groups	2,873,481	2	1,436,740.50	.71
Within groups	17,583,520	9	1,953,724.50	



FIGURE 2

ANALYSIS OF CHANGES IN MEAN NET FARM INCOME  
FOR THREE GROUPS OF KANSAS FARMERS  
FROM 1960 MEAN NET FARM INCOMES

Entering the table of F with the appropriate number of degrees of freedom resulted in no significant difference in the rate of change of farm income for the five year period. Upon examining the data it was concluded that more variance occurred within groups than between groups. It was also concluded that as for this test of significance the three groups could be compared as the rate of change did not vary significantly.

Rate of change before and after. Figure 3 was developed to show the rate of change in farm income before farm business analysis training was offered and after. The first two entries for each group were essentially the same as those found in Figure 2. The years 1963 and 1964 were plotted using the actual income of 1962 as the base year.

The rate of change of farm income for the years 1960 through 1962 was tested by analysis of variance. A summary of the test follows:

SOURCE	SUM OF SQUARES	df	MEAN SQUARE	F
Between Groups	212,046	2	106,023.00	.13
Within Groups	2,294,429	3	809,809.60	

After consulting a table for the distribution of F with the appropriate degrees of freedom it was determined that no significant differences occurred in the rate of change of farm income for the years 1960 through 1962.

The rate of change of farm income for the years 1962 through 1964 was tested by analysis of variance. A summary of the test follows:

SOURCE	SUM OF SQUARES	df	MEAN SQUARE	F
Between Groups	3,953,896	2	1,976,948.00	.51
Within Groups	8,654,563	3	2,888,187.60	

Consulting the table for the distribution of F with the appropriate number of degrees of freedom revealed no significant difference in rate



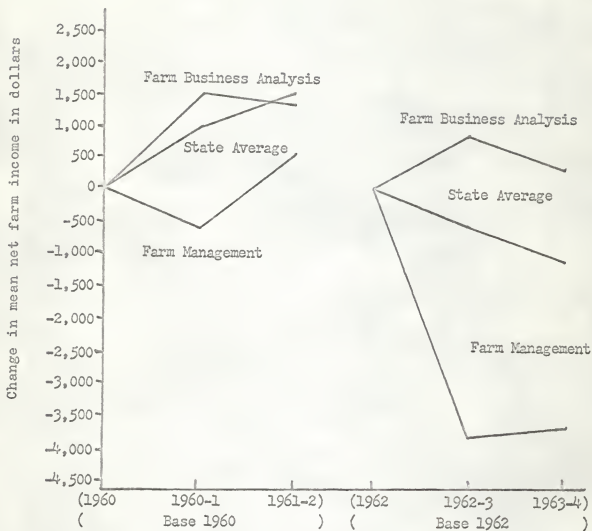


FIGURE 3

CHANGES IN NET FARM INCOME BEFORE AND AFTER  
FARM BUSINESS ANALYSIS TRAINING.

of change of net farm income for the years 1962 through 1964. It was concluded that no significant changes had occurred in the rate of change of farm income during the period studied.

Predicted farm income. The farm income for the years 1960, 1961, and 1962 was used to determine the rate of change in farm income for each group. The farm management group had a gain of \$309 per year, the farm business analysis group a gain of \$693 per year, and the state average group a gain of \$722 for this period of years. These rates were used to plot the predicted income level for 1963 and 1964. Figure 4 was developed to show the incomes during the first three years, the predicted income for 1963 and 1964 and the actual income for the latter two years.

Inspection of Figure 4 indicated that the farm management and state average groups actual farm income dropped well below the predicted level. The income for the farm business analysis group was above the predicted level in 1963 and nearer to the predicted level in 1964 than either of the other groups. The variance between predicted income and actual income was tested for significance by analysis of variance. A summary of the F test follows:

SOURCE	SUM OF SQUARES	df	MEAN SQUARE	F
Between Groups	13,908,456	2	6,954,228.00	13.71
Within Groups	1,522,017	3	507,339.00	

A table for the distribution of F was checked with the appropriate number of degrees of freedom and the variance in incomes from the predicted level was found to be significant at the .05 level of confidence.

The t Test was then used to determine the location of specific variances. A significant variance was found between the farm business analysis group and the farm management group. The variance found between farm management group

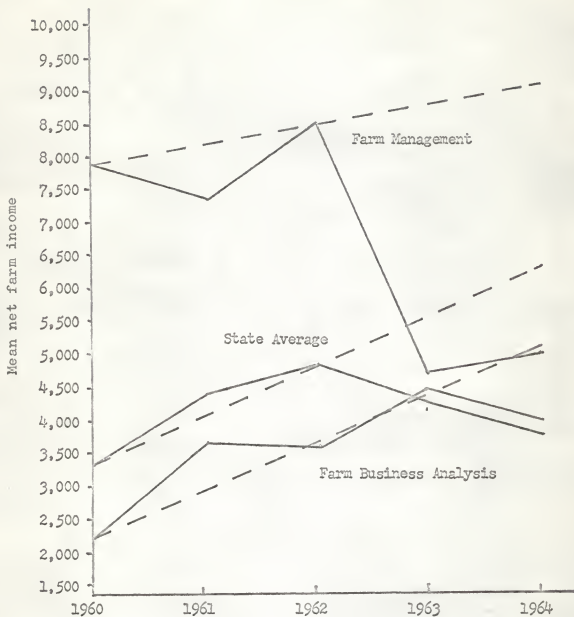


FIGURE 4

ACTUAL NET FARM INCOME AND PREDICTED NET FARM INCOME  
FOR 1963 AND 1964 BASED ON 1960 THROUGH 1962  
ACTUAL NET FARM INCOMES.

and the state average group was also tested with the t Test. No significant difference at the .05 level of significance was found.

It was concluded by the researcher that the significant difference in variance of income between predicted and actual income was mostly due to the \$4,216 decline of the farm management group from its predicted level. It was earlier shown that the farm income of the management group initially varied from the other groups beyond the limits set for this study. Therefore the difference in variance from the predicted farm income was not interpreted to disprove the null hypothesis.

## CHAPTER IV

## SUMMARY AND CONCLUSIONS

The change in net farm income of thirty-six farm business analysis class members, of the farm management association members, and the average of all farmers in the state was determined for each of the years 1960 through 1964. A random sample technique was used to select the farm business analysis farms and a personal interview was used to determine net farm income for each year. The average net farm income for the farm management associations was taken from the state farm management summary. The state average net farm income was taken from the Kansas State Board of Agriculture annual report. To insure uniformity of procedure a standard set of inventory values and depreciation rates was used for the farm business analysis group.

The population was limited to the selected farm business analysis class members that were willing to provide information for the interview and to the farms included in the state farm management summary and Kansas State Board of Agriculture annual report. The study was limited to the years 1960 through 1964.

The farm business analysis group was given instruction in farm business analysis in 1963 and 1964. No attempt was made to eliminate other factors that might influence farm income. The supposition was that farm income would vary at the same rate before and after training was given.

The net farm income and the rate of change in net farm income was determined for each of the groups. Analysis of variance was used to test the significance of the variances. When necessary the t Test was used to compare the groups two at a time.

The study showed an increase in farm income for all groups during the first three years. Only the farm business analysis group continued to show an increase in farm income for the last two years. The predicted farm income based on the actual 1960, 1961, and 1962 incomes was plotted for each group. The farm incomes of all groups fell below the predicted income for 1964.

No significant differences were found in the farm income or in the rate of change in farm income when the farm business analysis and the state average group were compared. The farm income for the first three years was significantly higher for the farm management group when compared with either of the other groups. No significant differences were found when variation from the predicted farm income in 1963 and 1964 were tested.

The author noted the fact that farm income of the farm management group was more than \$3,000 higher than either of the other groups in each of the first three years and that there was less than \$1,200 difference between the three groups in the last three years. Low crop yields and a sharp decline in cattle prices were cited as a possible cause for the reduction in farm income of the farm management group in 1963 and 1964. This decline in farm income was significant at the .05 level of confidence. The exact reason that this decline was not reflected in the other groups was not shown by this study.

The conclusion was that considerable variation did exist in the rate of change of net farm income between the three groups studied, however, this variation was not significant at the .05 level of confidence. The conclusion would support the null hypothesis that farm income would change at the same rate regardless of training in farm business analysis.

## CHAPTER V

## RECOMMENDATIONS

The need of this study was based partially on a need for motivation of young farmers to keep more extensive records and the need to justify the vocational agriculture teacher's time for this program. Although the study showed some benefit from the farm business analysis program no specific recommendation can be made for the promotion of the program. As long as the program could be offered at a nominal cost to the local school the existing programs could be continued.

Since the farm business analysis program was started in the fall of 1962 and a complete course of instruction had not been completed by any of the farmers at the time of the study, further study was recommended. A follow-up study on the same young farmers five years later might show a considerable difference in the changes in net farm income.

The researcher observed a definite improvement in record keeping procedures for the group receiving farm business analysis training. Prior to 1963 the "shoe box" was the chief file box and the only source of farm records in many cases. Since 1963 all of those interviewed had used the Kansas Farm and Household Account Book or a similar account book and many had tax records and legal papers filed in metal filing cabinets. Many of the farmers were pleased with their records and seemed to have confidence in the value of the farm business analysis program. In the opinion of the researcher the increased knowledge of the financial status of the farm business would more than offset the time and expense of keeping the farm records through the farm business analysis program.

The researcher also observed a favorable and cooperative attitude on the part of the interviewees towards the vocational agriculture program in their school system.

For future studies of this nature the researcher would recommend that some method for checking the uniformity of inventory valuation be included in the design of the study.

As a final recommendation a correlation study might have been developed to compare the rate of change in net farm income before and after farm business analysis training was offered.



## ACKNOWLEDGEMENTS

Acknowledgement is due Professor Raymond J. Agan for his valuable assistance as major instructor, Extension Economist, John H. Coolidge, for assistance in securing data, and John L. Wilson, Agricultural Statistician, Kansas State Board of Agriculture for his assistance in the collection of data.

The author also wishes to express his appreciation to the young farmers and their vocational agriculture instructors who were essential in providing data to make this study possible.

## BIBLIOGRAPHY

### 1. Books

- Garrett, Henry E. Elementary Statistics. Second Edition. New York: David McKay Company, Inc., 1962.
- Moses, Lincoln E. and Robert V. Cakford. Tables of Random Permutations. Stanford, California: Stanford University Press, 1963.
- Van Dalen, Deobold B. Understanding Educational Research An Introduction. New York: McGraw-Hill Book Company, Inc., 1962.

### 2. Publications

- Agan, Raymond J. and C. C. Eustace. "Teaching Farm Business Analysis in Programs of Vocational Agriculture for Young Farmers in Kansas Communities," Kansas State Board for Vocational Education. Topeka: Kansas, 1962.
- Statistical Division of Kansas State Board of Agriculture, Kansas Agriculture: 1963 1964. 47th Report: Topeka: State Printer, 1964.
- United States Department of Health, Education, and Welfare. Farm Business Analysis, Guidelines for a Suggested Program in Farm Management, OE-81010, Circular No. 752: Washington: United States Government Printing Office, 1964.

### 3. Periodicals

- Anderson, C. A. "Long-time Planning for Adult I, II, and III," Agricultural Education Magazine, 32:53-54, September, 1959.
- Carlson, Jerry. "What Computers Are Ready to Do for You," Farm Journal, 89:21-23, July, 1965.
- Curtis, Samuel M. "Summer Assistance for Adult Farmers," Agricultural Education Magazine, 37:304-5, June, 1965.
- Duis, H. F. "New Approach to Teaching Farm Management is Necessary," Agricultural Education Magazine, 36:51, September, 1963.
- Edington, E. D. "Predicting the Success of Pennsylvania Young Farmers in Farm Management," Agricultural Education Magazine, 35: 61-62, October, 1962.
- Fidler, Lloyd B. "More Effective Young and Adult Farmer Courses," Agricultural Education Magazine, 33:45-46, August, 1960.

- Lester, Herschel T., Jr. "Establishing Young Men in a Farm Business," Agricultural Education Magazine, 34:42-44, August, 1961.
- Marvin, R. Paul. "Farm Business Analysis Can be Taught," Agricultural Education Magazine, 36:57-58, September, 1963.
- McKinsey, J. Wendell. "How Socio-economic Changes Affect Farm Life," American Vocational Journal, 37:26-27, February, 1962.
- Peterson, Milo J. "Profit is the Goal of Adult Farmer Teaching," Agricultural Education Magazine, 36:182-4, February, 1964.
- Saue, William K. "Farm Record Analysis as a Source of Farm Management Guides," Agricultural Education Magazine, 34:272, June, 1962.
- Scarborough, C. "Farm Management for Whom?" Agricultural Education Magazine, 36:54-55, September, 1963.
- Yeatts, A. L., Jr. "Look to the Young Farmers," American Vocational Journal, 36:12-13, January, 1961.

#### 4. Collections

- Edington, Everett D. "Abilities and Characteristics of Young Adult Dairy Farmers in Pennsylvania Which are Associated With Successful Farm Management," Dissertation Abstracts. Ann Arbor, Michigan: University Microfilms, Inc., 1962. 22:3791-2.
- Lester, H. T., Jr. "How Young Men in Missouri Communities Serviced by Vocational Agriculture Start and Progress in Farming," Dissertation Abstracts. Ann Arbor, Michigan: University Microfilms, Inc., 1960. 21:2614.

## APPENDICES

## APPENDIX A

TABLE IV  
STANDARD INVENTORY VALUES USED

Livestock	Value	Seed, Feed, and Supplies	Value
Cattle		Wheat	\$1.70/bu.
Calves	50	(Except end of year 1964)	1.40/bu.
Yearlings	75	Oats	.70/bu.
Two-year olds	100	Barley	.90/bu.
Mature	150	Corn	1.10/bu.
Hogs		Grain sorghums	1.70/cwt.
Gilts	30	Soybeans	2.40/bu.
Mature	50	Alfalfa hay	26.00/ton
Sheep		Prairie hay	20.00/ton
Lambs	10	Silage	7.00/ton
Mature	15	Supplement	3.50/cwt.
Horses			
Colt	50		
Mature	100		
Poultry	$\frac{1}{2}$		

TABLE V  
PROCEDURE FOR DEPRECIATION

Classification	Method	Years Life	Salvage Value
Machinery	Straight line	10	None
Permanent improvements	Straight line	20	None
Purchased breeding livestock	Straight line	6	150

## APPENDIX B

## INTERVIEW RECORDING SHEET TO DETERMINE

## NET FARM INCOME ON ACCRUAL BASIS

The following recording sheet was used to record information and to compute net farm income as reported to the researcher during the interview.

## CREDITS

## INVENTORY AT END OF YEAR AND SALES DURING THE YEAR

	1960	1961	1962	1963	1964
Cattle					
Hogs					
Sheep					
Horses					
Poultry					
Eggs					
Dairy products					
Crops and supplies					
Custom work					
Miscellaneous receipts					
Dairy and breeding stock (only if sold)					
_____					
_____					
_____					
_____					
TOTAL CREDITS					

## DEBITS

## BEGINNING INVENTORY AND PURCHASES

	1960	1961	1962	1963	1964
Cattle					
Hogs					
Sheep					
Horses					
Poultry					
Crops and supplies					
_____					
_____					
_____					
_____					
TOTAL DEBITS					
GROSS INCOME					
(Credits - Debits)					

## EXPENSES

Feed bought					
Labor hired					
Farm fuel and oil					
Automobile expense (farm share)					
Repairs					
Trucking and machine hire					
Seed and crop expense					



## EXPENSES (Continued)

	1960	1961	1962	1963	1964
Veterinary and livestock expense					
Utilities (farm share)					
Taxes, interest, rent, insurance, etc.					
Repairs on buildings and farm improvements					
_____					
_____					
_____					
_____					
Depreciation on farm machinery					
Depreciation on permanent improvements					
_____					
_____					
TOTAL EXPENSES					
NET FARM INCOME (Gross income - Expenses)					

List of high school graduating classmates now farming in the community.

Name	Address	Location of farm
------	---------	------------------

High school graduation date \_\_\_\_\_

Marital status \_\_\_\_\_

Farm size in acres \_\_\_\_\_

219 N. Indiana  
Columbus, Kansas  
May , 1965

Dear

I am conducting interviews with selected Farm Business Analysis class members in Kansas to secure data for a master's thesis which I plan to complete this summer. I want to determine the net farm income for fifty Farm Business Analysis class members for each of the years 1960 through 1964. The averages of these figures will then be compared with similiar data secured from a comparable group.

I would like to enlist your help in the following way:

1. To contact the selected farmers and set up a suitable time for the interviews
2. To provide direction to the farm.

You may assure the farmers that the information will be kept in strict confidence and no names will be attached to the interview form. The farmer should have his records available for the five year period. The interview will not take more than two hours.

The farmers from your class and the times I would like to make the interview are:

- 1.
- 2.
- 3.
- 4.

Please contact the farmers and return the enclosed card as soon as possible. If the suggested time is impossible, please set up a suitable time and date. I would like to complete the interviews by the middle of June. I will be available anytime after May 31, with the exception of conference week.

Sincerely,

Harold Dean Knewtson  
Vocational Agriculture  
Instructor

FARM INCOME OF YOUNG FARMERS ENROLLED  
IN FARM BUSINESS ANALYSIS

by

HAROLD DEAN KNEWTSON

B. S., Kansas State University, 1960

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AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

School of Education

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

1965

A program of instruction in farm business analysis was developed in 1962 by a group of Kansas vocational agriculture teachers under the direction of Agan and Eustace. Classes were organized as part of the vocational agriculture program and instruction was given to 107 young farmers in Kansas in 1963 and 1964. The problem was to determine if the rate of change in farm income of young farmers in Kansas was accelerated during the time they received instruction in farm business analysis.

Three groups of farmers were selected for the study. A random sample technique was used to select fifty young farmers that had received instruction in farm business analysis. An attempt was made to interview each of these young farmers to determine farm income for the years 1960 through 1964. Thirty-eight were interviewed. Farm income figures for the same period from the state Farm Management Summary were used for the farm management group. Realized net farm income for the state average group was taken from the Kansas State Board of Agriculture reports.

Net farm income was determined for each group for the years 1960 through 1964. The farm business analysis group gained an average of \$693 per year before instruction was given. During the same three years the farm management group had gained at the rate of \$309 per year and the state average group had gained at the rate of \$722 per year. It was predicted that the farm income would continue to increase at these rates or that variation would be at constant rates for each group.

Farm income increased at a rate of \$164 per year for the farm business analysis group after instruction was given. The farm management

group had a reduction of \$1,799 per year and the state average group had a reduction of \$541 per year during the same two years.

The variances in farm income and in the rate of change were tested at the .05 level of confidence by analysis of variance and the t Test. No significant difference was found between the state average group and the farm business analysis group for either the amount of change in farm income or the variance from the predicted rate of increase.

The farm management group was found to have a significantly higher farm income during the first three years when compared with either of the other groups. The variance from the predicted rate of change for the farm management group was significant when compared with the farm business analysis group and not significant when compared with the state average group.

From the results of the study it was concluded that since the farm income of the farm management group varied significantly from the other groups for the years 1960 through 1962 it could not be compared with the other groups during the last two years.

Although some variance did occur in favor of the farm business analysis group, it was concluded that no significant differences had occurred in the rate of change of farm income after farm business analysis instruction was offered.