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To the Graduate Council:

I am submitting to you a thesis written by Frank M. DeFriesse entitled "An Evaluation of the Farm Record Project of the Tennessee Agricultural Extension Service." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Economics.

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AN EVALUATION OF THE FARM RECORD PROJECT OF THE
TENNESSEE AGRICULTURAL EXTENSION SERVICE

A THESIS

Submitted to
The Graduate Council
of
The University of Tennessee
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for the degree of
Master of Science

by
Frank M. DeFrieze

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TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
Decisions faced by farmers	1
Information needed in decision making	2
Need for wise decisions	4
Problems of a record program	6
Purpose or objectives of the study	8
Procedure and source of data	10
Organization of the study	11
II. THE PRESENT PROGRAM	12
Historical development	12
Establishment of the department	14
Test-demonstration	16
Kinds of records used	18
Record analysis	20
Adjustment planning	23
Case study	25
Group analysis	25

CHAPTER

PAGE

III. POTENTIAL ROLE OF A FARM

RECORD PROGRAM	28
Role for extension service	32
Problem identification	32
Successful farm identifi-	
cation	34
Farm planning	36
Role for college teaching	39
Role for research	40

IV. KINDS OF RECORDS AND ANALYSIS 44

General costs and returns	45
Advantages of cost and	
returns records	45
Limitations of cost and	
returns records	47
Factor analysis	48
Budget analysis	51
Enterprise accounts	52
Physical records	53
Personal and documentary	
records	54

V. ORGANIZATION OF A RECORD

PROGRAM	55
-------------------	----

CHAPTER	PAGE
V. (continued)	
Project supervision	55
Extension supervision	56
Research supervision	59
Joint extension-research supervision	59
Methods of tabulation	60
Type of summaries	62
Local summaries	62
State summaries	63
Selection of cooperators	63
Statistical sample	64
Selection by local groups	65
VI. SUMMARY AND CONCLUSIONS	66
BIBLIOGRAPHY	70

LIST OF TABLES

TABLE	PAGE
I. Number of Farm Records Summarized by Years, Tennessee, 1927-1957	15
II. Participation Farm Income Tax Training School Tennessee 1953-1957	24
III. Farm Records and Supervision Responsibility Southern Region States--1958	57

CHAPTER I

INTRODUCTION

Decisions Faced by Farmers

Modern farming is a complex business involving the knowledge of many basic and applied sciences. The manager of a farm is continually faced with responsibility of making decisions that affect the welfare of his business and his family. These decisions may vary from deciding whether to milk before or after breakfast to deciding whether to shift from beef to dairy or maybe whether to buy the tract of adjoining land. Not only must the farmer have knowledge of the technology of these various alternatives, but he needs to know something about how to choose the best alternative. This process by which one choice is selected from among those that are available is known as the decision making process.¹

¹ Carl C. Malone and Lucile Holaday Malone, Book Preview: Decision Making and Management for Farm and Home (Ames: The Iowa State College Press, 1958), p. 7.

Information Needed in Decision Making

Some economists contend that there are only two kinds of information involved in the management of a farm: (1) price data and (2) input-output data. A more careful look indicates five broad subject-matter areas which managers must study:²

1. Price structure and change.
2. Production methods and responses (including weather effects).
3. Prospective technological developments.
4. The behavior and capacities of people associated with farm businesses.
5. The economic, political, and social situation in which a farm business operates.

The farm manager deals with decision making in connection with economic organization and operation of the farm. In the area of organization the operator must decide on the kinds and amounts of products to be produced and the kinds and amounts of resources to use in obtaining their production. In the area of operation

² Glenn L. Johnson and Cecil B. Haver, Decision Making Principles in Farm Management, Kentucky Agricultural Experiment Station, Bulletin 593, 1953, p. 8.

he must decide how to get the work done, the order of operation, how much time to devote to each job and the method or practice to use.

The decision making process is a mental, not physical, operation. It is the responsibility of management and the process begins when the family sees something they think is worth trying to change. The steps or tasks in this process may be classified as: (1) observation, (2) analysis, (3) decision concerning the problems under consideration, (4) action-taking, and (5) acceptance of responsibility for the decision.³ A sixth step might be getting ready to move on to other things when the job underway is finished. To intelligently make these decisions there is need for knowledge which can be used as a guide in predicting the results of the proposed action. One good source of this information can be found in the analysis of accurately recorded happenings in the farm records on the farm in question. Records from other farms with similar situations or records from a group of farms with problems closely associated with the problem confronting the individual may also be helpful.

³ Glenn L. Johnson, Managerial Concepts for Agriculture, Kentucky Agricultural Experiment Station, Bulletin 619, 1954, p. 12.

Need for Wise Decisions

Characteristics of agriculture today point to the need for more accurate and personalized information to be used by the individual farmer as a basis for the development of both short and long range farm plans. Changing economic conditions have placed the farmer in a position where he must use all available sources of information and techniques to maintain or improve his income position. The realized net income (income available for spending after the farmer has paid all of his production expenses) of the farmer in the United States in 1957 was four per cent lower than 1956.⁴ The Tennessee farmer did not fare so well since the estimated realized net income in 1957 was eleven per cent lower than 1956.⁵

Production expenses on Tennessee farms have increased from 48.3 per cent of the realized gross income in 1950 to 56.2 per cent in 1957.⁶ Records kept by test demonstration farmers in Tennessee showed that production

⁴U. S. Department of Agriculture, Agricultural Marketing Service Farm Income Situation FIS--167, February 1958 (Washington: Government Printing Office, 1958), p. 1.

⁵Ibid., p. 26.

⁶U. S. Department of Agriculture, Agricultural Marketing Service Farm Income Situation FIS--165, September 1957 (Washington: Government Printing Office, 1957), pp. 12-13.

expenses were 57.3 per cent of the gross farm income in 1951 and 67.8 per cent in 1956.⁷

If the level of living now attained by the farm family is to be continued, the net income level must be maintained or improved. According to the 1954 Census of Agriculture farm families in Tennessee are enjoying many of the home conveniences similar to the urban families. The extent of these conveniences is indicated by the per cent of the farm families reporting the following items:⁸

1. 91 per cent with electricity.
2. 36 per cent with piped-running water.
3. 30 per cent with telephones
4. 25 per cent with television
5. 17 per cent with home freezer

The type and quantity of farm expenses and level of living expected by the farm family have helped place the farmer in the position where careful management and improved technology must be applied if these obligations are to be met and the living standards maintained or improved. The analysis and use of farm business records

⁷Farm Management Department, "Changes Found on 100 Test Demonstration Farms 1951-1956" (Unpublished preliminary tabulation, Agricultural Extension Service, The University of Tennessee, Knoxville, 1958).

⁸U. S. Bureau of the Census, 1954 Census of Agriculture, Tennessee, Vol. 1, Part 20 (Washington: Government Printing Office, 1956), p. 94.

can contribute very materially in providing guide lines for successful planning and operation of the farm.

Problems of a Record Program

In looking at the problems connected with the future conduct of a record program it is necessary to look at the source of records to be used. Will it be only those records associated with some other program as test demonstration, farm and home development, or some other classification of required record keepers? If only those who request record analysis are used will it give a cross section of the agricultural conditions in Tennessee? How can the cross sectional requirement be reached most effectively?

The varied conditions of Tennessee agriculture with fifteen major areas and twenty-five minor areas ranging from the small general mountain farm in the eastern part of the state to cotton farms in the Mississippi River Bottom make the standardization of farm records quite difficult.⁹ The usual record including

⁹ B. H. Luebke, et al., Types of Farming In Tennessee, Tennessee Agricultural Experiment Station, Bulletin 169, 1939, p. 40.

inventories, financial transactions and production information could in a general way meet the needs. The addition of enterprise, poultry production or milk production (DHIA) records could add valuable information for both the farmer and educational programs.

The kind of record analysis would depend upon the use to be made of it. This ranges from the needs of the farmer completing his tax return, or preparing a net worth statement for his banker to justify a loan, to the agricultural specialist attempting to determine the most efficient combination of enterprises for a particular area in the state or secure "input-output" data for a particular type of farm.

How many records would be analyzed? This anticipates the analysis taking place at the College of Agriculture, either at one central point or under the supervision of the college at different locations in the state. Again the problem as to the kind of analysis to make becomes important. A brief net income calculation could be worked fairly rapidly while group analysis involving efficiency factors would be much more time consuming. Along with the number to be analyzed would come the question of the size of the budget for this work. Would it be large enough to mechanize the analysis process?

The supervision of the project presents a problem of consideration of change from the present organization. Could more effective organization of the project be accomplished with a change in supervision in keeping with the objectives of the existing record project?

Purpose or Objectives of the Study

This is a study of farm record analysis, particularly as it relates to the records of the families who are cooperating with the Tennessee Agricultural Extension Service farm record project. The major objectives of this study are:

1. To examine the present methods of farm record analysis being used in Tennessee. This includes farm, county, and state level analysis. A study of methods cannot be done very effectively without considering the use which is made of the analysis. Thus it becomes a problem requiring the application of basic economics, relating the "input" of finances and time required to prepare the analysis to the "output" of effective use of the analysis.

2. To examine the methods used in other states by the college of agriculture and other organizations, giving particular attention to trends in the work and possible

projections of activity.

3. To determine the possibility of all three divisions of the college of agriculture participating in the farm record project.

4. To make recommendations as to the area in which the college of agriculture could be working, the departments or groups involved and the size of the project.

No attempt was made to reach a final conclusion which would preclude any further study of the problem. Instead the attempt was to appraise the strength and weaknesses of the alternative possibilities.

A few basic assumptions must be recognized in this study. First, the farm record is to be the basis of the information to be analyzed. Second, a farm business survey can be of much value in farm management research. This study, however, will not attempt to persuade anyone to forsake the survey method and take up records, as its concern is in the analysis and use of records. Third, while the project leadership in Tennessee rests with extension personnel, this does not preclude the future possibility of research leadership or joint extension-research-teaching participation. Fourth, the farmer automatically grants permission for

the use of record analysis information in group studies. For case studies it may be advisable to secure the specific permission of the record keeper before publishing the results of analysis.

Procedure and Source of Data

It is difficult to attempt to evaluate a project of this kind. The evaluation of methods, as in this case, may be based too much on judgment and bias may be injected into the conclusions. Also the analysis of the situation may not include all influences, for example, all test demonstrators were required to keep a complete farm business record and this resulted in some poor quality records being submitted for analysis.

Much of the data for this study comes from the files of the farm management department of the Tennessee Agricultural Extension Service and was based on more than thirty years of records and experience. Procedures followed by other states were studied. The Southern Region Extension Farm Management Committee was interviewed by an informal questionnaire. Reports made by such groups as the various regional farm management research committees were also helpful. The Journal of Farm Economics

provided some excellent discussions on methodology. The agricultural Census Reports and unpublished annual reports of the Tennessee Agricultural Extension Service were also sources of basic information. Numerous books on accounting, Farm Management, and Agricultural Economics were helpful.

Organization of the Study

This thesis is organized into six chapters. Chapter I is the introduction giving the nature of the problem, objectives of the study, approach to the problem, and the organization of the report.

Chapter II discusses the present program as it is being carried out.

Chapter III includes the potential role of the record program in extension, teaching, and research.

Chapter IV includes a study of the kinds of records to be kept and the analysis to be made.

Chapter V is a study of the organization of the record program.

Chapter VI is the summary and conclusions.

CHAPTER II

PRESENT PROGRAM

The present program cannot be accurately discussed without making a brief study of the history of farm record work in Tennessee. Such a review includes the beginning of farm record work, those factors contributing to the success as well as those which have tended to place limits on it. The kinds of record used, the types of analysis, and the uses made of them are also a part of this discussion.

Historical Development

For more than thirty years the Tennessee Agricultural Extension Service has been analyzing farm business records as a part of its educational program in farm management. This record analysis project has been an extension service activity from the beginning with the county agent being responsible for the field contact and the specialist providing much of the technical information and promotional leadership.

The ground work for this project was laid in 1918 with the newly appointed extension farm management

specialist distributing some farm record forms and giving instructions on keeping these records.¹ The demand for expansion of research and teaching at college level caused the specialist assigned to the project to be reassigned to research and teaching activities and the record project was dropped.

The project remained dormant until 1927 when it was reorganized under the supervision of the extension Agronomy Specialist.² A review of the history of Farm Management, and farm records are a segment of that field, shows that it "grew out of the applied agricultural sciences rather than as a logical expansion of the general field of economics."³ Andrew Boss and W. M. Hays of Minnesota were agronomists, G. F. Warren of Cornell was a horticulturist.⁴ Activities in Tennessee followed the pattern of other institutions by placing farm management in the hands of an agronomist.

The project started in 1927 by

. . . assisting farmers in Greene, Washington and Cheatham Counties to keep farm business

¹Annual Report, Farm Management Department, Agricultural Extension Service, The University of Tennessee, 1918, p. 245. (Unpublished.)

²Annual Reports, Farm Management Department, Agricultural Extension Service, The University of Tennessee, 1914-1957. (Unpublished.)

³J. Norman Efferson, Principles of Farm Management (New York: McGraw Hill Book Company, Inc., 1953), p. 12.

⁴Ibid., p. 11.

records. Sixteen records were completed. A report of each record was made to the farmers and county agents concerned and general information from the group of records was made available to all Extension workers.⁵

Establishment of the Department

A department of Farm Management was established in 1931 with the former agronomist as head of the department and an assistant specialist assigned to each of the four extension districts. A major responsibility of each specialist was supervising the keeping and analysis of farm records. The expansion of this work, as shown in Table I, was reflected in the fact that the number of records analyzed in 1932 was 543, which was more than twice the number in the project the previous year. The slight reduction in 1933 to 488 records may have been influenced by the general economic instability and by the fact that one of the farm management specialists was assigned to assist with an out-of-state project for part of the year.

⁵ Historical Appraisal of Agricultural Extension Work in Tennessee 1914-1939, Agricultural Extension Service, The University of Tennessee, 1939, p. 138. (Unpublished.)

TABLE I

NUMBER OF FARM RECORDS SUMMARIZED BY
YEARS, TENNESSEE, 1927-1957^a

Year	Number of Records	Year	Number of Records
1927	16	1945	903
1928	116	1946	900
1929	154	1947	936
		1948	800
1930	212	1949	878
1931	265		
1932	543	1950	1,064
1933	488	1951	524
1934	101	1952	400
		1953	417
1935	1,156	1954	493
1936	2,486		
1937	3,358	1955	412
1938	3,157	1956	308
1939	3,004	1957	300
		1958	390 ^b
1940	2,953		
1941	2,929		
1942	2,607		
1943	2,250		
1944	2,296		

^aSource: Tennessee Agricultural Extension Annual Reports and Extension Farm Management Reports. (Unpublished.)

^bTotal number farm records submitted in 1958 for the 1957 production year.

The depression along with Extension responsibility for the Agricultural Adjustment Administration (Triple A) program largely accounts for the tremendous drop in 1934 to 101 records. The emphasis placed on farm records by the Agricultural Adjustment Administration through their educational efforts and their distribution of a record book to any one desiring it helped to increase the number analyzed in 1935 to 1156. To this point the farm record program had been on a voluntary basis. Any farmer who completed a farm record and wanted an analysis could submit the book to the county agent and the summary and analysis would be prepared. Two federal programs assisted in the analysis work. A W.P.A. (Works Progress Administration) project was approved providing some full time clerical assistance for the farm record project. The other was the N.Y.A. (National Youth Administration) which provided funds for employing college students on a part-time basis to help with their educational program.

Test Demonstration

The next big mile-post in record work in Tennessee came with the introduction of test demonstration late in the fall of 1934 and spring of 1935. This was a cooperative program of the Extension Service and the Tennessee

Valley Authority. Through a contractual arrangement T.V.A. made available fertilizer materials "for experimentation, education, and introduction of the use of such products in cooperation with practical farmers so as to obtain information as to the value, effect, and best method of their use."⁶ They also contracted with the Agricultural Extension Service to employ personnel to supervise the use of this fertilizer material and determine the results of its use. This placed an assistant county agent in each of the counties draining into the Tennessee River and its tributaries. One of the responsibilities of this assistant agent was to work with from 40 to 125 test demonstration farmers in farm planning and record keeping.

The farmer approved to use these fertilizer materials was required to keep a farm business record and submit it for analysis. This reduced the record keepers to a "captive group" and soon the only records analyzed were for test demonstration. The maximum number of records was reached in 1937 when 3,358 were analyzed for the 1936 business year. Much of the mechanical operation of analysis was handled with the punch card system of IBM equipment.

⁶
48 Stat. 61-63, Section 5e (1933).

The need of this equipment in the war effort of World War II removed it from the record project and in an attempt to continue to maintain the large number of records a shorter summary and analysis was planned for the 1942 business records. This was not very satisfactory and finally in 1945 the number was reduced still further, partially due to work loads and partially due to test demonstration policy which by now was governing the record project.

A further reduction in the number of records submitted to the state office occurred in 1951. By shifting the analysis for about one-half of the records to the county staff it was possible to meet the test demonstration budget reduction for clerical work.

Kinds of Records Used

The first records were designed to give the record keeper information as to the net farm or labor income. This record included the financial accounts (receipts, expenses, and inventory valuation) and physical quantities for production and inventories for the whole farm.

The record form was developed by the Agricultural Extension Service and distributed primarily by the county workers. This type record was continued until the

Agricultural Adjustment Administration published a book to be used in connection with the production control programs. Since this book was designed to be used over the entire United States it did not meet the needs of the Tennessee farmer as well as was desired. This fact along with the changes in the income tax law to provide added revenue for the war effort prompted the Tennessee Farm Bureau to begin its activity in supplying a farm record book more suited to Tennessee conditions.⁷ This book, with the revisions which have been made, is currently in use and Farm Bureau, Internal Revenue Service and Extension united in a training program for its use.

With the beginning of test demonstration in 1935, many methods were tried to develop and improve farm record techniques. One of these was the use of the inventory-type record. Extension Publication 187, "A Planned Farm Program" was prepared to provide an annual physical inventory of land resources, livestock numbers, feed and supplies in inventory.

The individual enterprise record was also developed for poultry, dairy, and a few particular crops. The

⁷ Annual Report, Farm Management Department, Agricultural Extension Service, The University of Tennessee, 1942, p. 3. (Unpublished.)

poultry flock record and Dairy Herd Improvement Association (DHIA) records have been most useful in the educational programs when combined with the overall farm business record.

Beginning in 1955 a few test demonstration families kept a family financial record. This included the non-farm receipts and expenditures of the family and proved helpful in determining family expenditure patterns.

No attempt was made to include in this study the farm record book activity of the various commercial concerns such as machinery companies, banks, and farm supply firms. Neither was the work included of the Farmers Home Administration (F.H.A.) whose clients are required to keep a specific record book.

Many of the farmers using any of these various books may have been influenced to do so as a result of some promotional work by the county agent.

Record Analysis

The farm record analysis in Tennessee was made on both individual and group basis. The individual farmer was encouraged to keep a farm business record to assist with the adjustment planning of the farm operation. Through the analysis of the current record various

efficiency factors were calculated. These included:

1. Measures of farm earnings.
 - a. Total gross farm income.
 - b. Net farm income.
 - c. Income per acre.
2. Kind of organization.
 - a. Per cent of land in different crops.
 - b. Per cent returns from crops.
 - c. Per cent returns from livestock.
 - d. Animal units per acre.
 - e. Number of important sources of receipts.
3. Size of business.
 - a. Investment in land and other capital items.
 - b. Acres in farm and quality of soil.
 - c. Acres of crops.
 - d. Number of men working.
4. Efficiency of crop production.
 - a. Yields per acre.
 - b. Value of crops produced per acre.
 - c. Fertilizer costs per acre.
5. Efficiency of livestock production.
 - a. Milk sales per cow both physical and monetary.
 - b. Eggs per hen.
 - c. Pigs per litter or per sow.
 - d. Per cent calf crop.
 - e. Pounds beef sold per cow or per acre.

6. Labor efficiency.
 - a. Labor cost per acre.
 - b. Man work units per man.
7. Machinery efficiency.
 - a. Machinery cost per acre.
 - b. Quantity of work per machine.
8. Efficiency in buying and selling.
 - a. Expenses per acre.
 - b. Expenses per unit of livestock.

It is doubtful if a farmer considered all of these factors at one time but any of these factors could have been worked by the farmer with a little assistance.

Another type analysis that was made by the farmer was one which provided net farm income adjusted to meet the internal revenue service requirements. Since most of the farmers filing tax returns use the cash basis, a simple farm accounting procedure is sufficient to meet the requirements. It included beginning and ending inventories (to be used as a basis of depreciation), receipts and expenses. The participants in the Farm Income Tax Training Schools reported that the number tax returns which they assisted with increased from 8,057 in 1953 to 21,554 in

1957.⁸ This indication of the increasing interest in this phase of analysis is shown in Table II.

Adjustment Planning

The Extension Service also used the analysis of the individual record in adjustment planning. This has been referred to as "remedial planning" since it is used to determine the weak spots in the business and then offer possible remedies. This is based largely on factor analysis comparisons. The possibility of factor analysis is almost unlimited depending on the details found in the book. Usually this type analysis included more of the indexes such as crop yield index, man work units or animal units than was used by the individual farmer as more complex calculations were necessary to determine these factors.

The analysis was useful in comparing different types of enterprises in the organization of farms. Comparison of the net farm returns from a beef farm to that of a dairy farm or varying sizes of operation of the same type of farming could be made.

⁸
Annual Reports, Farm Management Specialists,
Agricultural Extension Service, The University of Tennessee, 1953-1957. (Unpublished.)

TABLE II

PARTICIPATION FARM INCOME TAX TRAINING SCHOOL
TENNESSEE 1953-1957^c

	1953	1954	1955	1956	1957
Number participants	86	132	269	213	217
Number counties represented	55	61	75	61	69
Estimated returns completed last year	8,057	12,985	13,225	19,752	21,554
Anticipated number returns this year	NA ^d	NA ^d	19,106	21,462	21,876

^c Source: Annual Reports, Farm Management Specialist, Agricultural Extension Service, The University of Tennessee, 1953-1957.

^d Not available.

Case Study

One of the more popular methods was the case study type analysis which was used to show progress or the lack of progress over a period of years. An example of this is found in the Earl Tester report.⁹

Earl Tester was approved as a unit test demonstration farmer by his neighbors at a community meeting in 1935. . . .

Farm records show \$31 worth of 0-10-4 fertilizer and 16 per cent phosphate purchased in 1935 compared with \$58 spent for high-analysis phosphate, muriate of potash and nitrate of soda for home mixing in 1941. . . .

Better fertilization . . . enables Earl to produce more total bushels of grain with less damage to his land. For example, $5\frac{1}{2}$ acres of corn made 95 bushels in 1935 but $2\frac{3}{4}$ acres made 132 bushels in 1941. . . .

The quarterly reports prepared since 1953 for test demonstration activities usually included about twelve case studies each year. Practically all the basic information for these studies was taken from the farm business records.

Group Analysis

The early farm record analysis was largely on a county basis with simple averages and the high and low

⁹ Joe A. Elliott and E. P. Callahan, Farming for Victory and Peace, Publication 263, Agricultural Extension Service, The University of Tennessee, 1942, p. 6.

groups being calculated for a number of production and efficiency factors. The individual farm was compared with the county summary. After the removal of IBM equipment, this report was discontinued because of its complexity for hand sorting. In more recent years a very simplified county report has been made by the county workers using a limited number of efficiency factors. This type report has been very helpful in identifying problem areas for the individual farm.

Type-of-farming groupings have been made for both dairy and beef farming. The information in the record books is not in sufficient detail to be of most value in such an analysis.

Special studies have been made from the farm records. For example, "A Study of the Development of 100 Farm Unit Test Demonstrations in The Norris Area 1935-1939."¹⁰

The primary purpose of farm unit test demonstrations is to test the effect of liberal applications of phosphate fertilizers to farms representative of the important agricultural conditions of the region.

This study is an attempt to measure and describe the stages in the development of farm

10

A Statement of Results of the Farm Unit Test Demonstration Work, Agricultural Extension Service, The University of Tennessee, Special Circular No. 151, 1941, p. 27.

unit test demonstrations to date in the terms expressed by the farm business records kept by test demonstration farmers. For this purpose, transcripts of the records of 100 test demonstration farms in the area surrounding the Norris Reservoir for the years 1935-1939, inclusive, were assembled.

There is at the present time a study underway to determine some changes occurring on 100 test demonstration farms using the records for 1951 through 1955.

Some special analysis were made under contract for a specific purpose. In 1937 the Agricultural Adjustment Administration contracted for a project described as¹¹ "An analysis of records from tenant farms in selected type-of-farming areas in Tennessee, with special reference to the formulation of program under the Soil Conservation and Domestic Allotment Act." The objectives were: "To determine the nature of farm leasing and cropper arrangements in selected type-of-farming areas in Tennessee and the relation of tenure status to land use, soil conservation, farm management practices and the distribution of farm income." The procedure provided: "From approximately 1000 farm business records . . . for the year 1936, data will be tabulated and analyzed. . . ."

¹¹ Memorandum of Agreement between Tennessee Agricultural Extension Service, U. S. Department of Agriculture, Department of Agricultural Economics and the Agricultural Adjustment Administration, Effective Date April 1, 1937.

CHAPTER III

POTENTIAL ROLE OF A FARM RECORD PROGRAM

Any discussion of farm records very quickly begins to include farm management and it would be very impractical to discuss the potential role of farm record program without relating it to farm management. Other sources of farm management data must also be considered.

A farm record program as discussed here logically considers four groups: (1) the record keepers, (2) agricultural extension, (3) research and (4) resident teaching at college level. A discussion of the role of each combine to make up this chapter.

A farm record is the written story of the farm business recorded by the farmer as it happened. It includes (1) the inventories of resources used, both physical quantity and monetary value, (2) receipts and expenses incurred in the farming operation and (3) production information for both crops and livestock. This implies that the information will be in sufficient detail and organized in such a manner that the picture of the farm operation can be reconstructed at any future time either by the farmer or by professional workers.

Qualifications must now be established. One of the basic rules in a record project provides that:

No farm record should be kept until the producer has a definite need for the information to be assembled and a concrete use for the collected data after summarization at the close of the year. There is neither glory nor profit in records kept merely for the sake of keeping records. If records kept on the farm are adapted to the needs of the individual farmer and are used after having been assembled and summarized, however, the returns per hour of work applied on the records are likely to be higher than the earnings per hour from enterprise on the farm.¹

In looking at the potential role of farm business records it was assumed that records were of value in the area of farm management. Farm management can be defined as "the science which involves the organization and operation of the individual farm from the view point of efficiency and continuous profit."² Dr. Black becomes more specific when he states:

Farm management as now conceived in the United States is both a pure and an applied science. As a pure science, it seeks to extend a growing body of principles relating to the way in which agricultural resources are used; as an applied science, it endeavors to apply such of these principles as seem useful as a guide in the task of setting up and operating individual farms.³

¹J. Norman Efferson, Principles of Farm Management (New York: McGraw-Hill Book Company, Inc., 1953), p. 87.

²Ibid., p. 47.

³John D. Black, Farm Management As Applied Science (New York: Social Science Research Council, Bulletin Number 13, 1932), p. 11.

Basic farm management facts from which these farm management principles are developed may be obtained from (1) farm records, (2) farm surveys, (3) individual farms organized to take advantage of the controlled experimental method and (4) theoretical farm models developed according to the principles of economic theory and then tested under farming conditions.⁴

Farm accounts and farm surveys provide the most of the management facts from which these principles have been developed. The experimental method has been of little value to farm management research due to excessive expense in developing and maintaining sufficient individual farms to study the varying problems of management. It is more useful in the area enterprises rather than for the entire operating unit. Limited work in this field such as the pilot farms at the Ames Plantation is being started. The theoretical approach has been of little value in establishing farm management principles for farmers. It has been of value, however, when used as a check on the results obtained by other methods and to serve as a guide to aid in pointing out definite problems and in developing principles relating to these problems.

⁴Efferson, op. cit., p. 48.

Thus any farm record or organized system of farm accounting is just another farm tool and serves to aid the producer in obtaining greater net income or to maximize what ever satisfactions happen to be the goal of the farm operator and his family. If these records are not serving this purpose they are of no more value to the farmer than a piece of farm equipment which has been purchased but not used.

The record project must therefore be developed on these assumptions:

1. Records of the farm business, if accurately recorded and properly analyzed, are valuable tools to be used by the farm operator in making future adjustments.
2. Farm business records are a valuable source of information for:
 - a. The professional agricultural worker, particularly in the area of farm management. (It is possible for workers in other subject-matter areas to secure valuable information; however, too often the analysis is not made with this objective in mind.)
 - b. The county extension worker in county program planning.
 - c. Other farmers in planning their farm adjustments.

Role for Extension Service

Most states agree that farm accounting should be a basic project in any Farm Management extension program either at the state or county level. The intensity, size, and objectives of the project, however, tend to bring about a wide range of opinions. A recent survey made by the North Central Regional Farm Management Research Committee listed fourteen different classifications of objectives in the farm accounting studies in the thirteen states within the region.⁵

Problem Identification

One of the basic objectives of the Farm Management Extension record or accounting project was to assist with the identification of problems on the individual farm. The acceptance of new ideas is a rather complex process, beginning with becoming aware of the idea, practice or problem.⁶ In the decision-making process the first step is observation and the second is analysis.⁷ Thus, if the

⁵North Central Farm Management Research Committee, "Farm Record Projects in the North Central States," 1958, p. 2. (Mimeographed.)

⁶North Central Rural Sociology Committee, How Farm People Accept New Ideas, Iowa Agricultural Extension Service, Special Report No. 15, 1955, p. 3.

⁷Glenn L. Johnson, Managerial Concepts for Agriculture, Kentucky Agricultural Experiment Station, Bulletin 619, 1954, p. 12.

record keeper can be assisted in locating problems or weaknesses in his farm business, one of the basic steps in adjustment planning will have been accomplished. The problem may be of a very simple nature such that adjustment in production practices may be all that is needed or it could be more comprehensive and involve action including the entire operation of the farm.

Many times the problem identification process leads to the demand for a particular specialist. An analysis of the 1955 farm business record of a medium size East Tennessee farm revealed that the net farm income was not in keeping with what might reasonably be expected for the program which was underway. With poultry, tobacco, and beef providing the sources of income it was not too difficult to separate the individual enterprises. The egg production was above average (caged layers with a good culling schedule was used), poultry feed costs were not excessive, and mortality was not high; thus the return to poultry was good. The tobacco enterprise showed good yields and quality (as indicated by sale price) and fertilization costs were in line with recommendations. This left the beef enterprise to bear the blame. The record revealed: (1) the calf crop was much below average, (2) losses by death were high, (3) the breeding program was poorly planned (calves dropped in every month of the year), (4)

the marketing program appeared to have little planning (cattle sold at varying weights and throughout the entire year).

Thus the problem pointed to the need of counseling by a specialist in beef production. A visit to the farm by the county agent and the Extension Animal Husbandman confirmed these suspicions and further identified the problem.

Successful Farm Identification

Farm records provide a method of locating examples of outstanding farm success. Usually this assumes profit maximization to be the objective and success is measured in terms of net farm income. It is possible to locate other successful farms on which the objective may be maximizing conservation, production, or some other goals.

These examples make good cases for study at field days or farm tours where other farmers may observe the operations. They also serve as a basis for news stories for the press, radio, and television.

The records provide an effective means of evaluating farming systems, size of farm business or types of farming. This is particularly true if there are sufficient records to give a representative sample of the situations to be found in the state or area under

consideration. Too often generalizations have been made on the basis of conclusions arrived at from observing one or, at the most, just a few records. Farm record information would be most helpful in areas where new enterprises were under consideration, for young farmers who were getting started in farming or the group of farmers who were considering reducing the work load for their operations.

There is usually a problem of adapting research findings to farm conditions and being able to measure responses. The farm record project would be helpful in determining the response of these findings under farm conditions. In 1935 the experiment station recommendations for fertilization of pastures and sod crops were tried very extensively across the state in the test demonstration program.⁸ The results found in the farm records called for additional research and new recommendations.

The farm records provide a source of current localized information on the trends in farm costs and incomes. This information is extremely important for the extension worker to have available when discussing adjustments with a farmer or group of farmers. Records

⁸ Joe A. Elliott and E. P. Callahan, Farming for Victory and Peace, Publication 263, Agricultural Extension Service, The University of Tennessee, 1942, p. 3.

kept by test demonstration farmers in Tennessee showed that production expenses were 57.3 per cent of the gross farm income in 1951 and 67.8 per cent of the gross farm income in 1956.⁹

Farm Planning

The records provide localized data for farm planning or budgeting. The types of plans according to D. M. Thorpe fall into three groups:¹⁰

1. The informal judgment plan which is based on observation (if it works on one farm it ought to work on another farm) with no economic analysis such as budgeting being used and nothing is written down.

2. Farm record book analysis or remedial planning is a popular type of planning. In this approach the record books kept by the farmer or annual summaries of them, prepared by the Extension Farm Management Department, are reviewed with the farmer and serve as a basis for diagnosing the problems and suggesting solutions:

⁹ Changes Found on 100 Test Demonstration Farms, 1951-1956, Preliminary Tabulation, Farm Management Department, Agricultural Extension Service, The University of Tennessee, 1958. (Unpublished.)

¹⁰ D. M. Thorpe, "Application of Principles of Farm Management in the Agricultural Extension Service," Proceedings of the Workshop in Family Financial Management, College of Agriculture, The University of Tennessee, 1956, pp. 134-137. (Mimeographed.)

- a. If properly done, it provides an accurate basis for identifying weak points in the farm business and introducing measures to correct them.
- b. It provides a basis for deriving measures such as labor income, cost-return ratio, and crop yield indexes.
- c. It provides a basis for deriving estimates of input-output data for the various classes of land found on the farm.
- d. It provides a considerable amount of teaching material for use in a farm management program combined with farm classification and use of model farms for special study.

Some of the disadvantages are:

- a. When used as the main or only approach it requires a considerable investment of Extension resources in checking, summarizing and assisting farmers with analysis.
- b. When not combined with forward planning, it tends to result in static plans (farm records are backward looking--planning is forward looking).
- c. It often results in overemphasis on the on-farm situation and resources and inadequate consideration of off-farm factors affecting production possibilities.

3. Budget analysis is a more technical type of planning.

A budget is a summary of the production, prices, receipts, expenses and net income expected from a farming program. A budget is a means of looking forward into the future. Its primary purpose is to aid in choosing among alternative farming plans by estimating the amount of income that each will yield. Its secondary purpose is to estimate the quantities of inputs such as feed, labor and cash operating expense that will be needed during the year.¹¹

Farm planning by the budget analysis method can be done at different levels of intensity or completeness. From this viewpoint four forms of budgeting, with varying intensities within each, are commonly used by Extension workers. They are (1) partial budgeting, (2) simple whole farm budgeting, limited to cash receipts and expenses and more or less limited to an introductory approach with farm families; (3) intermediate whole farm budgeting which includes full budgeting of inputs and outputs, receipts and expenses for the major alternatives, associated changes in investment, and an accompanying financial plan; (4) advanced whole farm budgeting, which includes the intermediate plan plus a year-by-year program for developing the plan chosen, with budgets of receipts

¹¹ Raymond R. Beneke, Managing the Farm Business (New York: John Wiley and Sons, Inc., 1955), p. 292.

and expenditures for each year and accompanying schedules of annual borrowings and repayments.

Records also provide an excellent basis of information not only for selecting farms to be used but also guide materials for use in training extension personnel in working with specific farm problems and situations. This is particularly true in the area of Farm and Home Development where personnel are dealing with the unit approach to problem solving.

Role for College Teaching

The student in the classroom needs localized current data to use in applying the principles of farm management found in the college text books. In many instances the data relating to the farming operation are several years out of date and are based on situations localized by the writers. Accurately recorded and properly analyzed farm records can bridge the gap from abstract situations or unfamiliar conditions to areas about which the student is more familiar. This information could include production practices and data for budgeting and planning giving an opportunity to compare the plan against the actual situation. It could also provide a source of local illustrations for classroom study of good farm organization.

Farm records could provide a basis for classroom study of methods of analysis and information to be used in computing management factors. The student would also be provided with an opportunity to follow all the steps in a record project from assisting the farmer to start a record to an analysis of the information; then assist the farmer in planning adjustments, preparing income tax return, and any other uses which the farmer may be planning to make of it.

Role for Research

Probably no phase of farm management research can claim the seniority that goes with the farm accounting projects. "The first organized continuing research project in farm management in the United States was a farm accounting study."¹² This project began in 1902 in Minnesota with a recording of crop costs. In 1904 the project was expanded to include the entire farm business and has been in operation since except for 1918 and 1919 and 1946 through 1950.¹³

¹² George A. Pond, Farm Accounts as a Source of Data for Farm Management Research, Technical Bulletin 219, Agricultural Experiment Station, University of Minnesota, 1956, p. 3.

¹³ Ibid., p. 8.

The North Central Farm Management Research Committee reports twenty-one objectives given by the thirteen states in the North Central Region.¹⁴ A reclassification might list these objectives as:

1. To provide current and historical data on the whole farm and enterprise basis by:

- a. Size of farm.
- b. Type of farm.
- c. Tenure.
- d. Income.
- e. Expenses.
- f. Net earnings.
- g. Amounts and sources of capital.
- h. Machinery costs and rates of performance.
- i. Production rates.
- j. Land use.

2. To provide current information needed in farm and enterprise budgeting.

3. To determine the relative profitability of different enterprises and enterprise combination.

4. To keep research workers in touch with current farm operations and with the farmers objectives and general philosophy.

¹⁴North Central Farm Management Research Committee, "Farm Record Projects in the North Central States," 1958, p. 2. (Mimeographed.)

A survey of the record work in Illinois revealed the records to be useful sources of research data in these areas:¹⁵

1. Farm organization and operation. This is especially useful as a means of measuring the economic value of many farm organization and operation practices. The annual analysis for each farm account keeper shows how profitably he has operated his farm, those crop and livestock projects in which he excels and those places where the so-called leaks occur.
2. Land appraisal. This has proved particularly valuable as a means of arriving at a long-time productive value of farm lands.
3. Landlord-tenant relations. Records show the contributions and the return to each party, thus offering an opportunity for adjustment if it is needed.
4. Father-son agreement. Records have about the same value here as for landlord-tenant relations.
5. Determining the value of soil conservation practices. Records furnished most of the data for a study of the data for a study of the economic effects of a planned conservation program.

¹⁵B. L. Mosher, "Thirty Years of Farm Records in Illinois," Journal of Farm Economics, XXVII, 1945, pp. 30-37.

6. Farm credit studies.
7. Farm tax and transportation rate studies.
8. Evaluation of the use of TVA phosphates.
9. Evaluating the personal qualities of good farmers.
10. Farm planning for soil conservation and economic operation.
11. Graduate study programs.

CHAPTER IV

KINDS OF RECORDS AND ANALYSIS

There seemed to be at one time a general impression among those working with farmers and to some extent among farmers themselves that there was only one type of account which could be used and only one method of analyzing the account. This type of account and analysis was related very closely to the usual double-entry bookkeeping system used by most business firms. The belief that farm accounting must follow the standard double-entry procedure did much to retard farmer adoption of record keeping since it appeared to be too formal for the untrained farmer. The other extreme is illustrated in the story that is told of the farmer who ran into his burning barn, tore down the crib door and stumbled out of the fire badly scorched. When questioned about his action he stated that he could not let the crib door burn because it had his farm business records for the last ten years recorded on it. Somewhere in between the "formal bookkeeping methods" and the informal barn door record is an area which should be workable and helpful to farmers.

In this chapter the discussion will include the types of records such as general costs and returns, enterprise accounts and physical records along with their advantages and limitations.

General Costs and Returns

Essentially this is a financial record of the farm business. It includes the receipts and expenditures incurred, usually on an annual basis, in the operation of the farm; the beginning and ending inventory, both for quantitative and monetary amounts; and production data for both crops and livestock. This has been the principal type of record for the project in Tennessee. In the southern region it is also the predominate type of record. However, in the North Central area of the United States other types of records such as cost or enterprise records seem to have a higher priority.¹

Advantages of Costs and Returns Records

Information recorded in an accurate cost and return record of the farming operation is most helpful in preparing a schedule F for the income tax return. Most farmers

¹North Central Farm Management Research Committee, "Farm Record Projects in the North Central States," 1958, p. 8. (Mimeographed.)

in Tennessee use the cash method of reporting their income tax and this cost and returns type of record can supply practically all the information needed to complete the return.

Also if the tax return should happen to be questioned, in many instances the farm account book will be accepted as documentary evidence.

The cost and returns record can give an indication of over-all progress. In Tennessee it is used rather extensively as the basis of information for the individual farm progress reports which make up a part of the quarterly report submitted to TVA for test-demonstration. This record is particularly helpful in making comparisons of the same farm over a period of years or comparing a farm with other farms for the same year.

One of the more common comparisons is on the basis of income or factors related to income. Since profit maximization seems to be a prevalent goal of the farmer, his achievement must be measured in terms of net farm income or returns to labor and management. The cost and returns record, if accurately recorded and properly analyzed, will provide the information needed to determine such change or progress. Nearly seventy per cent of the North Central States reported using some measure of farm earnings

or financial success of the whole farm in their record studies.²

Limitations of Cost and Returns Records

While an advantage of this record is to provide income tax information this use tends to place a restriction that the farm business activities be recorded for tax purposes only. The farmer is required by law, within certain limitations, to file a tax return and a self-employment return for social security benefits. There is direct competition for the use of the record by those preparing the farm management analysis for educational purposes and farmer preparing a tax return. This period of competition has been lengthened by the moving of the final date for filing the tax return to April 15. There is also the problem of the entries in the record being made with the tax return in mind. This can be confusing particularly in the area of depreciation when certain "fast write off" schedules are allowed such as was the case for grain storage or soil and water conservation costs.

The general cost and returns record, in many instances, is not in sufficient detail to determine physical

²Ibid., p. 17.

input-output relationships. The records in Tennessee do usually provide the physical quantities of fertilizer and lime for the various crops, but the record may not indicate the quantity of seed or labor for the enterprise. This seems to be the usual situation for most enterprises. The total quantity of feed purchased or produced is listed, and as a result of the feed, management and investment the amount of income is determined but the feed input-output relationship is not usually obtainable. This is especially true if there happens to be more than one enterprise using the same or similar input. For example, how are the fertilizer inputs determined for a small grain-lespedeza combination? How can the feed inputs from pasture be related to the out-puts of cattle and hogs that have grazed on the same field? These questions cannot be easily answered from a general costs and returns record.

The record, unless it helps to improve the farm operation, is of little value to the farmer. This presents the problem of how to analyze the information recorded so that it gives the most accurate and complete interpretation of the situation.

Factor Analysis

Much of the work in Tennessee has been built around factor analysis. This method included the conventional

efficiency factors with variations for localized situations. The efficiency factors appear to be more easily understood than some of the other methods of record analysis. This may be the result of these factors having been used before farm groups for more than thirty years, thus becoming a part of the farmer's vocabulary. The farmer compares these factors for his operation to some established standard which gives him pride if he is equal to or above the standard.

The efficiency factor analysis method can be used with one farm or a group of farms so that it is rather flexible. This eliminates the need for a specific number of records.

This method furnishes the farmer a diagnosis of the strong and weak points in his farm organization. It becomes a starting point for adjustments in the farm operation.

It provides the professional worker, in this case the Extension Economist, an indication of areas needing attention. If for example a number of the records show milk sales per cow to be about 5,000 pounds, then it is time to schedule some work with the dairy specialist in those counties to discuss feeding and management.

There are limitations to the use of the factor analysis method. The nature of the farm business makes

the measurement of its efficiency a real problem. The following conditions contribute to the difficulty of evaluating the efficiency of the farm as a unit:³

1. The farm operator normally furnishes both labor and management on a non-cash basis.

2. Management is particularly hard to evaluate since it varies widely in capacity and has no well-established market.

3. Members of the family, with widely varying abilities, contribute labor and at times management on a non-cash basis.

4. The valuation of farm products consumed on the farm is difficult to determine since usually no record is kept. (Tennessee gave up trying to secure this years ago.)

5. The charge for land is difficult to determine.

The factor method seems to assume a continuing increase of output for all units of input. It implies that neither the principle of diminishing economic returns nor the principle of diminishing physical returns applies. This could be interpreted that all is needed to increase output is to increase the units of input.

³H. D. M. Case and Paul E. Johnson, Principles of Farm Management (Chicago: J. B. Lippincott Company, 1953), p. 324.

The factor method also seems to assume that each farmer can perform in a similar manner since their efficiency factors are compared to a set of uniform standards.

Budget Analysis

The farm record provides the farmer with the history of the operation of the farm. It suggests areas where changes could have been made to increase profits or production. The farmer needs to make plans for the years ahead and to predict the outcome of these plans.

Budget analysis has the advantage of presenting in an orderly fashion the various alternatives whether they are for a segment of the operation or the entire farm. The accuracy with which the outcome is predicted is dependent upon the reliability of the input-output data and the way it is organized in the budget.

Since the cost and returns type of account is not usually in sufficient detail to provide the input-output data needed in budget analysis another type account must be considered to help supply this information.

Enterprise Accounts

Since enterprise accounts were not used in connection with the record project the discussion must be on somewhat of an objective basis. The enterprise account should not be expected to replace the general costs and returns record. Its best use is to supplement the whole farm record so as to more adequately supply the data needed for the farmer to manage a farm on an efficient and intelligent basis. Not all farmers can or should keep enterprise accounts, and very few farmers would need to keep enterprise accounts on all the enterprises on their farm. This type of account consists of two groups of items: (1) those associated with the cost of the enterprise and (2) the returns or income from the enterprise.

The enterprise account provides a source of information as to the physical quantities for an individual enterprise and the costs associated with them. It provides the basic data needed for budgeting and is very useful when combined with the whole farm cost and returns account.

One of the big problems is the difficulty in securing the information in sufficient detail to be useful in enterprise accounting. The farmer has not been trained in this field and sometimes it appears to him that a "lump

sum" cost figure is sufficient. This type record is expensive to analyze since there is so much information to be summarized and studied. A representative sample is needed to provide reliable results and this representation may be difficult to obtain.

Oftentimes it is quite difficult if not impossible to prorate some of the expense on income items among the various enterprises.

Physical Records

This record may be included in the enterprise account since there is some overlapping. This type record includes the physical quantities of the inputs of production such as seed, fertilizer, feed, labor, and machinery; and the physical quantities of the outputs such as pounds of milk, beef, pork, poultry, or pounds, bushels, or tons of grain, hay, pasture, and the like.

This is a good source of the data needed in budgeting. It is difficult to secure accurately when the farmer is responsible for recording it.

Personal and Documentary Records

A good program of management requires some additional records which are not ordinarily considered as "business records." This group consists of the recording of some transactions for self protection such as deeds of the sale of property, deeds of trust, easements, and right-of-way leases. Another type of record includes the ones used by the purebred livestock producer to verify the pedigree of the animal. While these are not ordinarily considered a part of a standard farm account, they do perform a very important role in the successful operation of the farm.

CHAPTER V

ORGANIZATION OF A RECORD PROGRAM

The success of a farm record book project like success in managing a farm is dependent on several factors. Not only must the kind of record, the method of analysis, and the instruction to the record keeper be given careful planning, but the organizational setup for the program must be adequately developed.

Decisions must be made as to: (1) the organization to sponsor the project; (2) the methods to be used in tabulation, manual or mechanical; (3) the scope of the summaries, state or local; and (4) the method of the selection of the cooperators.

Project Supervision

Many of the farm record projects are promoted and supervised by the research or extension divisions of the agricultural college or by joint arrangements of these divisions of the college. The North Central region reports that two of the states receive all of their support from research and one receives all of its support from extension; four states did not report this information, and the

other six used a combination arrangement.¹ In the Southern region six states reported 100 per cent extension; one reported 100 per cent research, and the other three states reported a combination arrangement as indicated in Table III. There seems to be a slight tendency for research to play a more prominent role in the North Central region while in the Southern region, extension service seemed to have more responsibility. One factor that may have influenced each report was the fact that research workers made the study in one region and extension workers completed an informal questionnaire in the other region. Also in the Southern region more than one-half the states were participating in the test-demonstration program which usually requires a farm record and it is extension sponsored.

Extension Supervision

One of the big advantages of extension supervision is the availability of a channel of farmer contact. The extension specialist working through the county staff has an entree already established. If a selling job is to be done the county agent is available to assist; if particular

¹ North Central Farm Management Research Committee, "Farm Record Projects in the North Central States," 1958, p. 7. (Mimeographed.)

TABLE III

FARM RECORDS AND SUPERVISION RESPONSIBILITY
SOUTHERN REGION STATES--1958^e

State	Number of Records	Supervision Per Cent	
		Extension	Research
Alabama	0	0	0
Arkansas	300	50	50
Florida	NR ^f		
Georgia	125 ^g	100	
Kentucky	100 ^g	100	100
Louisiana	NR ^f		
Mississippi	100 ^g	100	
North Carolina	300 ^g	90	10
Oklahoma	25 ^g 25	50	50
South Carolina	60	100	
Tennessee	390 ^g	100	
Texas	0	0	0
Virginia	375 ^h	100	

^e Source: Informal questionnaire submitted to members of Southern Region Extension Farm Management Committee.

^f No report.

^g Test Demonstration Farms only.

^h Test Demonstration Number not given.

specifications require certain types of farms, again the county agent should be able to direct the specialist to the farms meeting the requirements.

The extension worker can take the results of the records back to other farmers through the established channels and help to create more interest in the project or bring about favorable changes.

The supervision may be less expensive since the contacts may be made at the same time the specialist is in the county on other projects, or he may work on the record project in one county and some other project in another, thus reducing travel cost by being able to pro-rate it.

Trying to work a record project along with other projects may be one of the limitations of extension supervision. The extension specialist becomes so busy with other projects that not enough time can be devoted to the record project to make it a success.

In many instances the extension worker is not sufficiently trained in methods of analysis to do the best job. This may result in just taking off part of the "top cream" analysis instead of making a more complete analysis.

Farm record analysis or analysis of any data requires some time for concentration. It cannot be picked

up for one day and then pushed aside for several days then back to it again. This is especially true in group analysis or the analysis of changes occurring over a period of time for one farm.

Research Supervision

A major advantage of research supervision is that by training and experience the research worker is usually in a better position to supervise the analysis of farm records. Research supervision may make it possible to shift emphasis of the record project as a result of the findings in other projects.

If the field work must be done by the research worker, and it requires special supervision, the work could be more expensive on a per unit basis. The expense might be reduced by placing a graduate student in charge of the project. Then the experience and training advantage might be lost.

Sometimes the research report tends to become rather technical so that it is not as easily understood by the farmer.

Joint Extension-Research Supervision

This combination could unite the advantages of the contact channels of extension with the improved technical know-how of research so as to give a strong, well balanced record project.

If the record analyses of research are of value in farm management research, they should also be useful in extension farm management teaching; and if extension record projects are sufficiently complete and accurate to do extension teaching they should also provide useful research data. If this be the case then by joint supervision there should be some economy of funds and personnel.

Those states reporting extension-research projects as satisfactory noted definite economies.² More information was made available to each party to the cooperative arrangement and at less cost per unit than if they had worked alone.

Methods of Tabulation

One of the big problems with a farm record project is the large amount of work required to make the necessary analysis of the records. This work can all be manual, or it can be primarily mechanical.

The record book work in Tennessee has been manual since about 1942. At the present two clerical workers

² George A. Pond, Farm Accounts as a Source of Data for Farm Management Research, Technical Bulletin 219, Agricultural Experiment Station, University of Minnesota, 1956, p. 19.

devote nearly full time to the project thus placing the cost per record at approximately twenty dollars. However, only a very limited analysis can be made since there is so little time left after making a file copy of the basic information.

The field checking and supervisory costs are difficult to calculate accurately due to the joint costs which cannot be allocated. In the five states with non-association projects the field costs were estimated from no cost listed to twenty-five dollars per record.³

If the record information in Tennessee could be placed on cards for use with IBM equipment, the group analysis work would be almost unlimited. However, the cost for this would be at least fifty per cent higher for about the same number of records since the present staff could not perform the added work of coding the information for cards. There is a possibility that all the present test-demonstration records (approximately 1,000) could be submitted to state office for summary and analysis, thus giving a much larger sample. This change would probably more than double the total costs, but the county staff would be free to expand their other activities. If

³ North Central Farm Management Research Committee, "Farm Record Projects in the North Central States," 1958, p. 23. (Mimeographed.)

a system could be devised to satisfactorily take the information directly from the record book to the card some savings might be effected.

Type of Summaries

The determination of this decision could be reached in conclusion for the problem above. If it were decided to use IBM equipment it would of necessity be at state level. This would preclude the possibility of summaries at the local level.

Local Summaries

The local summary may be considered for localized record information or it may refer to the analysis being made at the local level. Localized information, on a county basis in Tennessee, has the advantage in an extension program of being more acceptable by the farm people. They know the conditions under which the farming was done. It seems closer to their situation than a study made in some other part of the state.

If the report is prepared locally it may come nearer having the information desired in it without extra material which could be confusing. It is possible to have the report prepared when it is needed and thus serve a more valuable purpose.

Local summaries have a tendency to be very limited with only a very few farms of a specific type included. The information presented could be misleading under these conditions. Local preparation of the report could be rather expensive in terms of opportunity costs. The local staff is not usually trained to do this work, and their efforts might be more profitably spent in other areas.

State Summaries

A state-wide report in most instances will contain a larger sample of farms and will come more nearly representing the various situations found across the state. A state summary can contain more information due to the training of those preparing the report and the equipment available for their use.

A state summary may not always be prepared in time to be of most value. It takes longer to prepare as it must be held until all the records are summarized. In some instances it contains information that is of little interest or value to all the local groups.

Selection of Cooperators

In planning a record project the question soon arises as to who will supply the record information. This becomes an important item for consideration since the

record keepers can be selected by statistical methods; they can be proposed by their neighbors; they can be any farmer who wants to submit a record; or they can be a contract group such as test-demonstration.

Statistical Sample

Writers in the field of farm management probably criticize farm records as a source of farm management data more because they are not representative than for any other reason. However, the predominance of the accounting method over the survey in farm management research in the North Central States seems to suggest that a random sample is not a prime essential in obtaining data for many kinds of farm management research.⁴

The statistical sample is good if it can be obtained but one major requirement in a record project is the willingness of the individual farmer to keep records. Many of the farm account studies seem to include farms with a sufficiently wide range of size, quality and organization to cover most of the farm management problems of the area.

⁴ Pond, op. cit., p. 17.

Selection by Local Groups

The records used at the present time are the result of indirect selection by local groups. The farmer was selected by his neighbors to become a test-demonstration farmer, and a farm record is one requirement of test-demonstration. This method of local selection usually reflects some of the local influence which could give a distorted picture, particularly if the object of the study were to determine the importance of a specific enterprise or practice.

CHAPTER VI

SUMMARY AND CONCLUSIONS

During the last thirty years the Agricultural Extension Farm Management Department has received more than 36,000 farm records (most of them from test-demonstrators) for summary and analysis. Each record that was complete was summarized and a copy filed in the Farm Management Office. Each farmer whose record was complete received a standardized efficiency factor analysis of the operation for the year. Until about 1942 a county summary was prepared on an efficiency factor basis and a copy of this summary was sent each farmer whose record was complete.

Several hundred farms have been used for case studies based on the farm business records kept during this time. These studies have been used to illustrate changes occurring in farming systems both for more efficient operation of the present system and the addition of new enterprises. They provided excellent result demonstrations for use in communities to illustrate to other farmers that "it can be done."

The individual case studies have been used to help justify the continuation projects such as test-demonstration, or to give an illustration of Extension Service activities to the Tennessee members of Congress.

Some group analyses have been made to determine patterns of farm operation for specific types of farming such as dairying. Attempts have been made to determine the changes occurring in an area such as Chestuee Watershed. During the earlier years of test-demonstration the records were used to determine the order of change when farm adjustments were made.

Until the last few years all the analysis work was done at one central office at state level. This provided a more complete cross section of the agriculture for the counties in the Tennessee River Valley area. More recently some of the analysis has been made by the Special Agents in Test-Demonstration on the county level using efficiency factor methods. This has helped create an appreciation for records and emphasize the need for completeness and detail.

One of the values of the records reaching the Knoxville Office has been the availability of a good source of current information of actual farm operations. It has helped to evaluate practices and enterprises in terms of what happened on the farm. It helps to keep the feet of the professional worker "down to earth" in regard to discussions and recommendations.

The farm record analysis project could be improved and strengthened in Tennessee.

The agriculture of the entire state should be included in the record project. At present important areas like much of Western Tennessee, the Central Basin, dark tobacco, Eastern Rim, Upper Cumberland River, and Cumberland Plateau are not included. To be of value on the local level each county needs at least a few records in the analysis project. A small number like this would mean that the records could be used primarily as case studies and that the sample would be too small to consider as indicating changes in farming systems.

The farmers should be encouraged to keep production records such as DHIA, poultry flock records, performance testing for beef and other enterprise records. If much of these data could be recorded in physical quantities it would provide the needed input-output information which would improve the effectiveness of the budgeting technique in farm management.

Information in these farm records would add much to the educational program of the College of Agriculture if it could be supplied to the various departments at an earlier date. This might be accomplished through the use of modern equipment designed to handle jobs of this kind. The IBM equipment used in some states has speeded up the analysis process.

It is possible that the record project could be improved if a jointly supervised project of Extension-research could be developed. If it should be undertaken, it would be necessary to prepare a formal project agreement so that there would be a clear understanding of the responsibilities.

If there were no opportunity to include more complete representation of the farming of the state in the record project then it might be advisable to consider reducing the present number to the point that only a few case study analyses be made.

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