The First Sixty Years of Farm Management Research in Minnesota 1902-1962

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PREFACE

Research is a continuing process; the research of today builds upon the knowledge and experience of yesterday. Steady improvement in research requires that current workers be familiar with the work of the past, the reasons for projects undertaken, procedures used and the major findings developed.

Research interest in farm management began with the start of agricultural research in the state and the establishment of the Agricultural Experiment Station. However, one can say that organized research in farm management in Minnesota began in 1902. The active participation in organized research by Dr. George A. Pond, one of the authors of this publication, dates back to 1915.

There undoubtedly were "grandfathers" in the spawning and development of the new field of Farm Management in its early days. However, if one were to nominate the "father" of the profession in the State of Minnesota, if one were to select the man who guided its early destiny and nurtured its growth among disciplines with intellectual vigor, unbounding zeal and personal devotion, that man would be George Pond. Through the years he has seen the profession burst into full bloom and many of his early notions come into fruition. In the process, he has counseled scores of young men as undergraduates and graduate students; his research has touched the operations of hundreds of thousands of farms here and abroad; and his public service has won him the admiration of farmers, agribusiness leaders and the general public.

In addition to summarizing farm management research in Minnesota, this bulletin briefly refers to the early farm management research studies in New York and other states in the Midwest. Undoubtedly, pioneer work in any one state was carefully observed and studied by farm management workers in adjoining states. No one state has had a "corner" on originality in research techniques. This free exchange of ideas, as Dr. Pond stresses, was a significant factor in developing farm management research in Minnesota.

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THE FIRST SIXTY YEARS OF FARM MANAGEMENT RESEARCH IN MINNESOTA, 1902-62*

CHAPTER I. THE BEGINNINGS OF AGRICULTURAL RESEARCH IN MINNESOTA

The Morrill Act, passed by the U. S. Congress on July 2, 1862, provided for a land grant college in each state to give instruction in agriculture and mechanic arts. This act stipulated that 10 percent of the funds received for this college could be used to purchase an experimental farm. So, the regents of the University of Minnesota authorized the land purchase for such an experimental farm in southeast Minneapolis near the campus. However, this land was ill adapted to agriculture and, eventually, was sold. The funds received were then used to purchase 155 acres in Ramsey County--these are now part of the present University farm.

The Hatch Act, passed by Congress in 1887, made $15,000 available annually to each state for an agricultural experiment station, thereby providing support for an agricultural research program. Edward C. Porter was appointed director of the Minnesota Agricultural Experiment Station set up under this act; Willet M. Hays of Iowa State College was his assistant. Subsequent Congressional enactments providing support for agricultural research included the Purnell Act, 1925; the Bankhead-Jones Act, 1937; and the Research and Marketing Act, 1946. In addition, two other acts significantly affected the development of research

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* Authorship of this report is shared by five individuals. The first four are natives of Minnesota--all started as research assistants and eventually became full professors at the University of Minnesota. G. A. Pond began in 1915, S. A. Engene and T. R. Nodland in 1929, and S. O. Berg in 1949. The senior author, though retired officially in 1958, joined his former colleagues in preparing this report. Through the entire period covered, the Farm Production Economics Division and its predecessor agencies in USDA cooperated with the University in conducting farm management research in this state. Since 1929, Mr. C. W. Crickman, Chief, Agricultural Adjustments Branch, Farm Economics Division of the Economic Research Service of the U. S. Department of Agriculture, has served as a coordinating agent in the farm management research activities administered jointly by the University of Minnesota and the U. S. Department of Agriculture.

in farm management: The Smith-Lever Act, 1914, provided support for agricultural extension; the Smith-Hughes Act, 1917, provided for vocational agricultural instruction in public schools. Although these two acts did not directly support farm management research, they provided new needs for its findings. They also afforded helpful cooperation in setting up and operating farm management research projects to provide the knowledge needed for resident and extension teaching.

Most early activity of the new Minnesota experiment station centered around crop production, both plant breeding and crop rotations, for through crops, wealth is extracted from the soil and made available for human use, either directly or as processed through livestock. But before any program could be fully developed, Hays accepted an appointment with the North Dakota Agricultural Experiment Station in 1891. There he laid out a series of crop rotation plots.

Hays returned to Minnesota in 1892. In 1894, with his farm superintendent, Andrew Boss, he set up a pattern of crop rotation experimental plots at the University farm similar to those in North Dakota. This rotation study was laid out in four series, each consisting of 11 one-tenth acre plots with a different system of cropping for each plot. These rotation studies brought out the effect of crop rotation on crop yields but they did not tell what crops or crop combinations would prove most profitable for an individual farm operator.

Effort was made to secure cost and income figures on these rotation plots in order to determine the relative profitability of different crops and cropping systems. But it soon became evident that cost data on one-tenth acre plots had little relation to costs on a representative field basis. Rotation plots, though yielding valuable agronomic information, did not provide the farmer an adequate or complete basis for crop choice. Nevertheless, they did clarify the need for specific information on farm costs, farm earnings, and factors determining or conditioning them. Unfortunately, no cost and income figures for these early cost studies were preserved. Apparently they were regarded as of no practical value.

The growing interest in improved farm management practices was reflected in introductory statements in several early agricultural experiment station bulletins. They expressed the need for advances in management techniques in order to keep pace with progress in crop and livestock production.

> Although agriculture is the largest industry in the United States and is persued by 35 percent of our population, it must be admitted by anyone who has closely observed the progress of agriculture that system and good management are not as highly developed in agriculture as in our other great industries. The success and industry of the American farmer is due to the unbounded fertility of the soils, the cheapness of our lands and the privilege of utilizing modern inventions in machinery rather than to systematic organization and efficient farm management.[1]

> In the past two or three years there is much evidence that farmers are awakening to the need for more knowledge concerning the science of business, and that they recognize it as a necessity if farming is to be profitable. Editors of agricultural papers are often asked, "What is the cost of producing an acre of corn?" "Or keeping a milch cow?" "Or the comparative cost of dairy farming and beef or hog farming?" These and similar questions indicate a growing desire and need for cost data which may find profitable application in agriculture as "cost data" tables have in civil engineering or as the railroad "operating expense" table has in the economical management of a railroad.[2]

> The term "farm management" includes the selection, planning, organization and development of the farm and the daily and yearly conduct of the farm business.

> The necessity of knowledge, wisdom, and skill in farm management cannot be overestimated. A European agricultural society found that on many farm estates for which it kept accounts, and for each of which long experience had established true invoice valuations, the net profits were determined mainly by the individual abilities of the respective managers, the net result on the investment ranging from 12 percent down to a loss of 3 percent and averaging 3 percent profit. In every farm neighborhood there are examples of men who make a marked success, others who as markedly fail, and still others of all gradations between success and failure, depending far more on differences in men than on differences in land or in materials, or opportunities, or other conditions.

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1. Hays, W. M. and E. C. Parker, 1906. The Cost of Producing Farm Products. Minn. Agri. Exp. Sta. Bull. 97, p. 9.

2. Parker, E. C. and T. P. Cooper, 1910. Cost of Producing Minnesota Farm Products, 1902-07. Minn. Agr. Exp. Sta. Bull. 117, p. 4.

> The object sought in research in farm management is to secure the elementary facts which must be utilized in organizing and conducting the business of the farm in such a way as to give the maximum of products, profits, and enjoyment to the owner and to the farm family, to supply farm products in the best way to all who need them, and gradually to increase productivity of the soil . . . .
>
> An analysis of the average farm business will show it to consist of a large number of separate enterprises or projects, any one of which is a business in itself. That each of these enterprises often overlaps every other one renders the farm as a whole a complex business. Into the production of income from each of these projects there enter, inevitably, the factors of man and horse labor; of cash expenditures; of depreciation of the soil, fences, buildings, machinery and livestock; and of a variety of other items, any one of which may, by becoming relatively too large, cause a loss for the individual project, and perhaps for the farm business as a whole . . . .
>
> Farm record keeping is a valuable part of farm management, but farm bookkeeping easily becomes so complicated as to be impractical. Especially is this true on the family farm where the farmer rarely has the bookkeeping habit and does not find it easy either to put down daily a large number of facts or to get time to summarize frequently and make useful a large amount of data.[3]

These early experiment station workers sensed that rapid and radical changes were occurring in production techniques. They knew that farm organization and management techniques had to keep pace with them or farming would be at a disadvantage as compared with other industries. They realized the need for economic as well as agronomic studies in planning more profitable farm organizations.

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3. Hays, W. M., A. Boss, A. D. Wilson, and T. P. Cooper, 1912. Farm Management--Organization of Teaching and Research. Minn. Agri. Exp. Sta. Bull. 125, pp. 7-8.

CHAPTER II. FARM COST ACCOUNTS

The Prewar Period, 1902-17

The Minnesota Agricultural Experiment Station, as organized under the Hatch Act of 1887, was headed by men trained in the field of crop production. As indicated, their early projects were crop rotation studies. G. F. Warren[4] made significant comments on this fact:

> It will be noted that, as in most countries, the first work in farm management was usually done by agronomists. The Annual Report of the American Farm Management Association for 1910 shows that farm management was taught in the same department as agronomy in twenty-five institutions . . . .
>
> The development was logical, and, I believe, fortunate. Of all the men working in agriculture the agronomists came nearest to seeing the farm as a whole. It was not a long step from crop rotations to cropping systems, and from that to the farm as a whole. Roberts, Hays, Hunt, Boss, and Larsen of Denmark were all agronomists who became interested in farm management.
>
> One distinct advantage of this procedure was that it resulted in immediate adoption of the scientific rather than the philosophical method of procedure. In the earlier days agronomists who went into farm management carried over their scientific methods at once into all their work. It may not always have been good science, but it was nevertheless the scientific point of view. It is also interesting to note the influence of this on the teaching in agricultural colleges in farm management, marketing, prices, and statistics. The methods used in teaching economics in those days were primarily lectures and reading. From the very beginning, courses in farm management included laboratory work because the teachers had been in the habit of having laboraties for scientific work. This practice has continued, and, while the field has broadened so that there is no longer any boundary line between economics and agricultural economics, the laboratory method is still generally used in all agricultural colleges.

Agronomists who planned the early crop rotation studies soon realized the need of determining the relative profitability of different crops within these rotations. The first field scale study of the economics of crop production in Minnesota was inaugurated in 1902 with the establishment of three "cost routes." This study was under the general direction of Hays.

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4. Warren, G. F., 1932. "The Origin and Development of Farm Economics in the United States." J. Farm Econ. Vol. XIV (1): pp.2-9.

> It required the initiative of energetic and far-seeing men to raise farm management to the rank of a clearly defined and generally recognized science. The first of these men who can be called pioneers of American agricultural economics was W. M. Hays. The scene of his activity was the University of Minnesota in St. Paul, which has remained one of the headquarters of agricultural economics research. Minnesota, too, had begun with cost of production studies made according to the experimental method, but Hays, who had directed this work since 1894 made a decisive step forward. In 1902 three "statistical routes" were established by him, which were composed originally of groups of 12 to 15 farms and later of 8 farms in each of three different districts of the state with well defined types of agriculture (dairying, meat production, grain growing).[5]

This initial farm management research project was supported jointly by the Minnesota Agricultural Experiment Station and the Bureau of Statistics, U. S. Department of Agriculture. In 1901 Hays and Boss selected 15 farms in each of three important agricultural areas: (1) Rice County, a dairy area in southeastern Minnesota, (2) Lyon County, a grain and meat-producing area in southwestern Minnesota, and (3) Norman County, a small grain and potato area in northwestern Minnesota. They considered these farms to be representative of the type of farming and quality of management dominant in the areas. About 45 farmers in each area were interviewed in order to find 15 who were representative and also willing to cooperate. It was necessary to limit the area to what could be covered in one day by horse travel.

The route in Lyon County was discontinued in 1910; in Rice County, in 1912. The route in Norman County was continued through 1917 in order to record shifts in type of farming occurring there as wheat declined in importance and potatoes and livestock entered the picture. (Because of the growing importance of dairying in Minnesota, a fourth route was started in 1913 in Wright County, an important dairy county. Twelve cooperators were included but they were visited only three times a week instead of six, as was the case with the other routes.)

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5. Frauendorfer, Sigmund von, 1928. "Development Methods and Results of Agricultural Economics Research in the United States." J. Farm Econ. Vol. X (3): p. 288.

For each area a fieldman visited each farm each weekday to secure the information needed. This data included: (1) a complete farm inventory at the beginning and end of each year, (2) a record of the hours of labor on each crop by operation, and (3) a record of other expenses of farm operation as well as an account of sales and other income. Most fieldmen were students in the School or College of Agriculture who left classes for 6-24 months in order to gain research experience and to help finance their education (see table 1). The advantage of longer service and more adequate experience on the part of fieldmen became increasingly evident as work progressed. Time was needed to secure the confidence and cooperation of farmers as well as to master research techniques.

No information secured in this study was returned to the cooperators supplying it. Moreover, fieldmen were specifically instructed not to advise these men about their farm operations or to supply them data from their records as a guide to management. The major objective was to get a representative cross-section of the agriculture of the area as currently operated.

These pioneer fieldmen began with little in the way of forms and record blanks and without specific instruction as to how to secure or record the information obtained. They carried notebooks in which they recorded information and their own observations. Later they checked and tabulated the information and mailed it to the cost accounting office at the University farm. These original reports are no longer available in the files. In all probability fieldmen differed considerably in methods of securing and recording data.

In 1953 the senior author of this report visited cooperators or their sons who were still living in the three original study areas. One of his questions concerned the help in farm management they received from their records and from consultation with the fieldmen. They were quick to point out the restrictions on advice and consultation. In general, fieldmen adhered to their function as recorders--not advisers. However, a few farmers admitted pressing the fieldmen

Table 1. Names and period of service of fieldmen on detailed accounting routes, 1902-17

Year	Fieldman	Months	Fieldman	Months	Fieldman	Months
	Rice County		Lyon County		Norman County	
1902	Parker, E. C.	12	Krum, H. G.	12	McKenzie, Wm.	12
1903	Headley, F. B.	12	Peck, W. A.	12	McKenzie, Wm.	12
1904	Headley, F. B.	6	Danielson, H. R.	12	Gregor, John	12
	Hacking, Earl	6				
1905	Headley, F. B.	7	Mowry, H. H.	12	Cooper, T. P.	12
	Mayland, Ed	5				
1906	Mayland, Ed	12	Bush, Harvey	12	Cooper, T. P.	12
1907	Mayland, Ed	12	McClelland, Geo.	12	Schneider, J. W.	6
					Greaves, H.	6
1908	McNelly, C. L.	12	McClelland, Geo.	6	Greaves, H.	6
			Peterson, W. I.	6	Stewart, C. D.	6
1909	Frear, D. W.	7	Matthews, Chas.	12	Brandt, H. P.	12
	Gore, J. E.	5				
1910	Gore, J. E.	5	Matthews, Chas.	6	Bredrold, A. J.	6
	Hagerman, W. F.	7	Lindeman, Otto	6	Billings, C. R.	6
1911	Punderson, J. W.	12		(108)	Billings, C. R.	6
					Houske, L. J.	6
1912	Comlossy, G. S.	12	Wright County		Krahler, Chas.	12
1913		(132)	Cowie, G. C.	12	Krahler, Chas.	12
1914			Onkka, W. E.	12	Krahler, Chas.	12
1915			Onkka, W. E.	12	Krahler, Chas.	12
1916			Langenbacher, R. A.	12	Krahler, Chas.	12
1917			Langenbacher, R. A.	12	Krahler, Chas.	12
				(60)		(192)
Average months per man		13.2	Lyon	12.0		17.5
			Wright	20.0		

about farm planning and occasionally getting help. A son pointed out that the crop rotation and field layout he used were planned for his father by the fieldman nearly 50 years earlier. The concept of getting a representative cross section of farming in the area clearly dominated the original plan for this project. Every effort was made by those in charge to leave operating and management practices entirely to the operator.

However, the fact that the fieldmen asked the farmer what he did each day, what he fed his livestock, and what acreage of each crop he planted would naturally lead to discussion of what and why. Undoubtedly, he was asked by the farmer what his neighbors were doing. These conversations must have affected the farmer's choice of enterprises and practices. Obviously, the more open-minded and progressive farmers would be most likely to cooperate with the University in such a project, so results would hardly represent an average cross-section of all farmers in the community, even though that was the obvious intent of these early researchers.

As work progressed, it became evident that restricting the cost records to crops and crop operations limited the study's usefulness. Most products of these farms were marketed through livestock, especially in Rice and Lyon Counties. So an important phase of farm operations was missed by ignoring livestock. In 1904, the scope of the study was expanded to cover the entire farm business.

The whole plan of operation was reorganized to fit this expansion of activity. The number of cooperators per route thus was reduced from 15 to 8 or 9. Although fieldmen still visited each farm each weekday, three times a month they also stayed overnight with each individual cooperator to get records on feeds, household expenses, farm products used for family consumption, and other details.

When the project was expanded in 1904, a small payment was made to some family member for recording personal and household expenses and the farm produce consumed by the family. Eventually, interest in the records grew to the extent

that a cash payment was no longer necessary as an incentive to securing cooperation; therefore, it was dropped.

The fieldman submitted the information secured to the University office that was set up in 1902 to handle the cost accounts records and analysis. An office clerk kept a complete set of double-entry accounts for each farm; all posting, bookkeeping, analysis, and summarization was done in this central office. It was as a student assistant in this office that the senior author of this report received his training in farm accounting during 1915-18.

The research analysis of the findings of these early cost accounting studies was published in experiment station bulletins (see table 2). In all these studies the University of Minnesota cooperated with USDA.

A "mail in" system of cost accounting was initiated on a trial basis in 1913. This method was developed in USDA at Washington and was in operation in several states. F. W. Peck was in charge of this work and also supervised other cost accounting studies under way in Minnesota from 1912 to 1919.

For this later study, forms used in the field and office were supplied by USDA. The number of farmers cooperating varied from eight to nine and were scattered about the southern half of the state. Peck visited these farms at the beginning of each year to assist the farmer in inventorying all farm property. The farms were platted each summer, giving an accurate measure of the acreage in each field and each crop. Each farmer kept a detailed record of hours of labor performed daily by enterprise and operation and, in most cases, by workman. At least once a month a detailed record of the kind and quantity of feed for each class of livestock was completed. All records were mailed to the University where a complete set of cost accounting records was kept for each farm.

An earnings statement was prepared at the end of the year for each cooperator; costs were computed for each crop and livestock product. Copies were given to each cooperator; he then was assisted in interpreting and using them in planning an

Table 2. Printed bulletins based on cost accounting studies, 1902-17

Bulletin number	Pages	Year issued	Years covered	Title	Authors
97	86	1906	1902-04	The Cost of Producing Farm Products	Hays, W. M. and Parker, E. C.
117	64	1910	1902-07	The Cost of Producing Minnesota Farm Products	Parker, E. C. and Cooper, T. P.
*	10	1911	1904-10	The Cost of Horse Labor	Cooper, T. P.
124	188	1911	1904-09	The Cost of Producing Minnesota Dairy Products	Cooper, T. P.
125	96	1912	1899-1910	Farm Management--Organization of Research and Teaching	Hays, W. M., Boss, A., Wilson, A. D., and Cooper, T. P.
145	48	1914	1908-12	Cost of Producing Minnesota Farm Products	Peck, F. W.
157	55	1916	1905-12	Labor Requirements of Crop Production	Cooper, T. P., Peck, F. W., and Boss, A.
161	43	1916	1905-12	Labor Requirements of Livestock Production	Boss, A., Peck, F. W., and Cooper, T. P.
162	31	1916	1905-14	The Cost of Living on Minnesota Farms, 1905-1914	Peck, F. W.
19+	12	1918	1908-16	The Cost of Milk Production	Peck, F. W., and Boss, A.
173+	36	1918	1908-16	The Cost of Milk Production	Peck, F. W., and Boss, A.
30+	8	1918	1913-17	Factors of Cost in Pork Production	Peck, F. W.
179	42	1918	1913-17	The Cost of Producing Minnesota Field Crops, 1912-17	Peck, F. W.
Totals	719	1906-18	1899-1917		

* Minnesota Farmers Library, Vol. 1, No. 4, March 1911 (apparently due to an error in printing the numbers duplicate Vol 1, No. 4, April 1910).

+ Printed by the Agricultural Extension Service; all others were Agricultural Experiment Station bulletins.

improved farm organization. This method sharply contrasted with the other cost accounting studies under way in which the farmer was supplied no information and no advice or service.

Data collected in this latter study were never published but the experience gained served as a basis for a complete reorganization of the cost accounting work when it was resumed in 1920.

The Postwar Period, 1920-53

The cost accounting studies were discontinued at the end of 1917 because of the war situation. In 1920 they were resumed but with substantial changes. There was a direct carryover of experience in that Boss was still in charge of farm management research. Furthermore, the senior author of this report, who had served under Peck from 1915 to 1918, became leader of the new cost accounting project. The new project was supported jointly by the University of Minnesota and USDA. The cooperating agency at Washington was headed in 1920 by Peck who had been in direct charge of farm management studies at Minnesota from 1912 to 1919.

This carryover of experience assured some degree of comparability and continuity in the prewar and postwar studies. Perhaps the most significant change was the fact that farmers generally were looking more to their agricultural experiment stations for guidance in planning their farm operations, especially in adjusting to current changes in the whole farm picture.

Furthermore, better roads and the general substitution of the auto for horse travel made it possible for one man to supervise and service more farms and to range over a larger area. The new associations included 20-25 farms as compared with seven to nine in earlier years.

Another radical change was in the concept of the function of these farm accounting studies. As already indicated, the major objective of earlier cost accounts was to secure an overall average picture of farm costs, farm income and

expense, and farm practices in general. These accounts were designed more to determine what was happening to farm costs and farmer's earnings than to determine what should be done to improve farm organization and maximize earnings.

Farmers were still enjoying postwar prosperity in 1919-20 but men like Boss could foresee the problems ahead and adjusted their farm research program to meet them. There was some public agitation for using farm cost records as a basis for government fixing of farm prices but project leaders adhered closely to developing farm management studies as a basis for planning the most effective and most profitable farm organization and resource utilization for individual farm operators. They were primarily concerned with keeping the farm business adjusted to current economic changes and developments--not price fixing.

Great attention was given in the postwar years to an analysis of factors affecting or conditioning a farmer's earnings. Physical elements of cost were presented both as a basis for checking the efficiency of current operations and for planning profitable farm organizations. Farmers operate in a highly dynamic environment. These farm cost accounting studies made it possible to supply current input-output data for a continuous program of checking weaknesses in the farm business and correcting them.

The areas covered by these postwar studies, the number of farms included, and the number of cooperating farmers are shown in table 3. In order to cover more areas these later cost accounting studies generally were rotated about the state more rapidly than was the case in prewar years. The last area shown in table 3 represented a different type of selection than was the case in the earlier associations. Cooperators in the 12 southern Minnesota counties were also members of the Southeastern and Southwestern Cooperative Farm Management Associations.

Since this study in southern Minnesota, no farm cost accounting research has been done in Minnesota. Records kept by members of cooperative farm

Table 3. Numbers of cooperators in cost accounting associations, 1920-53

Year	County or area				Total
	Steele	Cottonwood Jackson			
1920	23	21			44
1921	24	23			47
1922	22	24			46
1923	22	22			44
1924	22	23	Pine		45
1925	(113)	(113)	29	Polk	29
1926			25	18	43
1927	Rock,		26	18	44
1928	Nobles		(80)	20	20
1929	24			(56)	24
1930	24				24
1931	23	Stevens			23
1932	(71)	24			24
1933		22			22
1934		22	Winona		22
1935		15	19		34
1936		12	24		36
1937		(95)	23		23
1938			23		23
1939			21		21
1940			20	Nicollet	20
1941			(130)	26	26
1942				27	27
1943				24	24
1944	12 counties	Red		9	9
1945	Southern	River		7	7
	Minnesota	Valley		(93)	
1951	33	26			59
1952	29	(26)			29
1953	28				28
	(90)				
				Total	867

management services provide the same types of data as the cost accounting routes except a record of hours of labor by enterprise and operation. Records of time spent can be secured at less expense by survey or a mailed questionnaire. There are no plans at present for adding labor records to any current farm management study.

A major change in publication policy was introduced in 1920. Up to that time all results of farm cost accounting studies were published in printed bulletins--often long after data were collected. Only average costs for areas were published. But with the increasing demand for current cost and income data for farm planning, teaching, and extension purposes, data secured in these later cost accounts were made available soon after the production period through processed reports. Crop data were tabulated and published by or before the end of each production year; livestock costs and farm earnings data were made available for farm planning early in the succeeding year (see table 4).

The larger number of cooperators in these later cost accounting routes, the more detailed information obtained, and the fact that fieldmen assisted the cooperators in interpreting and using their records called for more mature and experienced fieldmen. Names of these fieldmen and their months of service are indicated in table 5. Of the six full-time fieldmen included in this tabulation, the average months of service were 63, as compared with 15 for fieldmen in the earlier cost studies. Experience on the part of the fieldmen reduced the supervision needed by project leaders. It also enabled fieldmen to gain the confidence of the cooperators and to be of greater service to them in applying the data secured.

In addition to the processed reports based on the cost accounting studies for the years 1920-53, 19 printed bulletins were published using the data secured. Six of these were extension bulletins and 13 were experiment station or technical bulletins (see table 6).

Table 4. Processed reports of cost accounting studies, 1920-54

Year	County	Number of reports	Pages	Year	County	Number of reports	Pages	Totals Number	Totals Pages
1921		1	3	1921		1	3	2	6
1922		1	5	1922	Cottonwood,	1	4	2	9
1923	Steele	1	7	1923	Jackson	1	5	2	12
1924		1	6	1924		1	7	2	13
1925		1	7	1925		1	7	2	14
1926		3	25	1926				3	25
1927	Pine	3	31	1927		3	37	6	68
1928		3	42	1928	Polk	3	37	6	79
1929				1929		3	51	3	51
1930		3	42	1930				3	42
1931	Rock, Nobles	3	51	1931				3	51
1932		3	77	1932				3	77
1933		3	92	1933				3	92
1934		3	79	1934				3	79
1935		1	19	1935				1	19
1936	Stevens	1	21	1936		3	64	4	85
1937		1	14	1937		3	54	4	68
1938				1938	Winona	3	63	3	63
1939				1939		3	66	3	66
1940				1940		3	67	3	67
1941				1941		3	68	3	68
1942		1	27	1942				1	27
1943		1	29	1943				1	29
1944	Nicollet	1	32	1944				1	32
1945				1945					
1946		1	34	1946				1	34
1952		2	63	1952	Red Riv. Val.	1	39	3	102
1953	South. Minn.	1	45	1953				1	45
1954		1	45	1954				1	45
					Total number of reports			73	
					Total number of pages				1368

Table 5. Names and periods of service of fieldmen on cost accounting routes, 1920-53

County	Fieldman	Period of service	
		Months	Dates
Steele	Helgeson, E. T.*	60	1920-24
Cottonwood, Jackson	Ruud, C. O.*	60	1920-24
Pine	Romlinson, F. H.*	36	1925-27
Polk	Ruud, C. O.*	36	1926-28
Rock, Nobles	Loreaux, R. H.*	36	1929-31
Stevens	Loreaux, R. H.*	30	1932-34
Stevens	Edson, A. W.	30	1934-36
Winona	Loreaux, R. H.*	36	1935-37
Winona	Wetherill, F. E.*	36	1938-40
Nicollet	Wetherill, F. E.*	26	1941-43
Nicollet	Hemming, C. J.*	6	1943
Nicollet	Dose, V. J.	23	1943-45
Red River Valley	Downing, L. J.	3	1951
Southeastern and Southwestern Minnesota Farm Management Services	Rorholm, Niels	36	1951-53

* Full-time fieldmen.

Table 6. Printed bulletins based on cost accounting studies, 1920-53*

Bulletin number	Class+	Pages	Year issued	Years covered	Title	Authors
62	Ext.	8	1922	1920	Lessons in Economical Hog Production	Cavert, W. L. and Pond, G. A.
64	Ext.	8	1922	1920	The Dairy Cow as a Market for Labor	Cavert, W. L. and Pond, G. A.
205	E. S.	135	1923	1920-22	A Study of Farm Organization in Southwestern Minnesota	Pond, G. A. and Tapp, J. W.
89	Ext.	16	1924	1920-23	Farm Management Principles for Southwestern Minnesota	Cavert, W. L. and Pond, G. A.
44	Tech.	108	1926	1920-24	A Study of Farm Organization in Southeastern Minnesota	Pond, G. A.
112	Ext.	16	1926	1920-24	Profitable Dairying	Cavert, W. L. and Pond, G. A.
270	E. S.	41	1930	1925-27	Factors Affecting the Physical and Economic Costs of Butterfat Production in Southeastern Minnesota	Pond, G. A. and Ezekiel, M.
139	Ext.	16	1931	1925-27	More Profitable Farming in Northeastern Minnesota	Cavert, W. L. and Pond, G. A.
279	E. S.	24	1931	1920-24	Relation of the Farm Home to the Farm Business	Studley, L. A.
282	E. S.	110	1931	1926-28	An Economic Study of Crop Production in the Red River Valley of Minn.	Pond, G. A., Sallee, G. A. and Crickman, C. W.
283	E. S.	58	1931	1926-28	An Economic Study of Livestock Possibilities in the Red River Valley of Minnesota	Sallee, G. A., Pond, G. A. and Crickman, C. W.
284	E. S.	84	1931	1926-28	Planning Systems of Farming for the Red River Valley of Minnesota	Pond, G. A., Sallee, G. A., and Crickman, C. W.
295	E. S.	104	1933	1925-27	Planning Farm Organizations for the Northeast Cutover Section of Minn.	Pond, G. A. and Crickman, C. W.
301	E. S.	76	1933	1929-31	Beef Cattle Production in Minnesota	Crickman, C. W., Sallee, G. A. and Peters, W. H.
166	Ext.	8	1934	1932	Cost of Production and Price	Pond, G. A.

309	E. S.	16	1934	1920-24	Suggestions to Purchasers of Farms	Cavert, W. L. and Pond, G. A.
138	Tech.	80	1939	1929-31	Farm Organization for Beef Cattle Production in Southwestern Minnesota	Sallee, G. A., Pond, G. A., and Crickman, C. W.
396	E. S.	15	1947	1935-40	Effect of an Erosion Control Program	Engene, S. A. and Anderson, A. W.
416	E. S.	20	1953	1920-49	Changes in the Dairy Farm Picture	McDaniel, W. E. and Pond, G. A.
Totals		943	1922-53	1920-49		

* The cooperating agency was USDA for all publications except Agricultural Experiment Station Bulletin 279 where it was the School of Home Economics.

+ Ext. = Agricultural Extension; E. S. = Experiment Station; and Tech. = Technical.

CHAPTER III. SURVEY AND QUESTIONNAIRE STUDIES

Another major source of farm management research data used in Minnesota was the survey or mail questionnaire study.

In a survey, the enumerator contacts the farm operator in person with a fixed schedule of questions covering the farm business operations. This survey may be designed to determine income and expense for the whole farm business or only for a single enterprise or operation within the business. The questioner can explain the significance and import of each question so as to be reasonably sure it is uniformly interpreted by all respondents. Answers are recorded on the survey schedule blanks by the enumerator; he must use his judgment as to whether questions are uniformly interpreted or require further explanation or elucidation. Obviously, the enumerator must be reasonably familiar with the area's agriculture if he is to pass sound judgment.

In a mail questionnaire study, a schedule of questions is mailed to the farm operator. He is requested to fill this in and return it to the research office sponsoring the study. Each individual puts his own interpretation on each question and answers accordingly. Usually, a more uniform interpretation is placed on each question in a survey than in a questionnaire study.

The farm survey was pioneered and developed by Warren of Cornell University. He first worked as a graduate assistant in orchard studies in Wayne County, New York. The first field work was done in 1903 in a study of apple production and marketing under the general direction of John Craig of the Department of Horticulture. Survey results were published as Cornell University Agricultural Experiment Station Bulletin 226, An Apple Orchard Survey in Wayne County, New York, in March 1905. The following summer Warren repeated this same type of orchard survey in Orleans County; data were published in May 1905 as An Apple Orchard Survey in Orleans County, New York.

These two studies convinced Warren and his associates that the farm survey could well include the entire farm business. They began in Tompkins County, New York. Several townships were covered but results had limited value from a farm management standpoint. The stress was then shifted to the farm business analysis survey as known today.

In 1907 two Tompkins County townships were surveyed but the data were not published. Another survey was made in 1908 and the data secured in these additional townships were considered of sufficient value to justify publication. The data appeared as Cornell Agricultural Experiment Station Bulletin 295, with Warren and K. C. Livermore as senior authors. The publication, a classic in the field, set the pattern for the farm business analysis survey that is still a major source of research data.

The first farm business analysis survey in Minnesota was initiated in Rice County in 1913. Boss quickly recognized the merits of the survey, especially as a means of identifying factors that determine or condition farm financial success in an area. For this purpose more cases are required than for cost determination. Cost accounting studies with a sufficient sample to determine factors would be prohibitively expensive.

W. L. Cavert was in charge of field work of this pioneer survey study in Minnesota. He had had previous training and experience with survey work under Warren in New York. He was assisted by S. B. Cleland, L. S. Robertson, and F. A. Corniea--men with a long record of research and extension service in farm management.

Objectives of this pioneer survey project in Minnesota were: "(1) to determine what profits, if any, farmers are making, (2) to determine the factors that influence and limit profits, if any, that farmers are making, and to learn, if possible, the relative importance of these factors when applied to individual farms; (3) to obtain data as a basis for definite and concrete suggestions to farmers who feel that their profits might be increased through a modification

of their present system of farm management."[6]

The farm survey represented a radical change in the method of studying the farm business as compared with the cost accounts already considered. In the farm survey method basic data are obtained by personal interview covering the past year or some past period as contrasted with the current daily or frequent reporting of inputs, production, or events as they occur in the accounting method. A much larger sample of farms can be covered for a given outlay by the survey method but with perhaps less precision and less detail. In accounting studies, questionable items can be referred back to the farmer supplying them since a constant contact is maintained with him; the survey is more of a "once over-all" proposition. Correcting or completing survey data is time consuming and increases the cost of data secured, but with a skilled enumerator little of this is required. Furthermore, the farmer probably has more confidence in the accuracy of facts he records himself than in answers he may give the survey enumerator. Farm accounts cost him time and effort--his time and effort.

No specific data are available as to the relative cost of a mail questionnaire, a survey, and accounting data. Obviously, it is less expensive to get a given quantity of data by mail questionnaire than by survey. But more accuracy can be secured by personal interview. However, this asset must be balanced against the additional cost involved in making this personal contact.

One obvious advantage of the survey or mail questionnaire method is the fact that representativeness of a given production period is known before the study is started. In accounting studies, one never knows if the period for which the study is planned will be reasonably representative as far as weather, prices, and other natural and economic factors are concerned. This disadvantage is well

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6. Boss, A., A. H. Benton, and W. L. Cavert, October 1917. A Farm Management Study in Southeastern Minnesota--Factors Affecting Profits. Minn. Agr. Exp. Sta. Bull. 172, p. 6.

illustrated in a cost accounting study started March 1, 1932 in Stevens County, Minnesota. The average yield of principal crops on these farms for 1932-35 is shown in table 7.

Table 7. Yield for harvested acres of specific crops on farm accounting route, Stevens County, Minnesota, 1932-35

Crop	1932	1933	1934	1935	County average 1923-32
			bushels per acre		
Spring wheat	13.5	5.4	3.6	13.2	12.4
Oats	45.2	11.1	9.4	45.5	32.8
Barley	25.6	7.5	6.3	25.3	25.6
Flax	7.8	3.2	2.2	9.9	8.5
Husked corn	28.8	9.2	8.8	28.1	28.1

An approximately normal crop was harvested in 1932 but severe drought cut yields in 1933 and caused almost complete crop failure in 1934. Crop yields were almost back to normal in 1935 but the severe drought of 1933 and 1934 robbed much of the accounting data collected in those years of value as a basis for farm planning and budgeting.

Since the first farm survey in Minnesota in 1913, the survey or mail questionnaire has been used in studying many farm management problems. Table 8 lists printed bulletins based wholly or in part on survey or mail questionnaires. In addition, 16 processed reports were published from 1928 to 1958 (table 9).

Table 8. Printed bulletins based wholly or in part on survey or questionnaire studies, 1916-55

Bulletin number	Pages	Year issued	Years covered	Title	Authors
154	35	1916	1915	The Cost of Producing Sugar Beets	Peck, F. W.
172	51	1917	1912	A Farm Management Survey in Southeastern Minnesota--Factors Influencing Profits	Boss, A., Benton, A. H., and Cavert, W. L.
178	32	1918	1912	Farm Tenancy and Leases	Benton, A. H.
180	43	1918	1914-17	Experiences of Northern Minnesota Settlers	Peck, F. W.
196	47	1921	1919	Farm Development Studies in Northern Minnesota	Worsham, C. G. and Boss, A.
65*	10	1922	1918-20	Making a Living on a Timber Farm	Cavert, W. L.
209	44	1924	1916-20	The Cost of Producing Apples in Minnesota, 1916-20	Brierley, W. G., Koppen, W. J., and Pond, G. A.
256	50	1929	1928	The Combine Harvester in Minnesota	Schwantes, A. J., Pond, G. A. Arny, A. C., Bailey, G. H. Black, R. D., Reynoldson, L. A., and Humphries, W. R.
262	72	1930	1929	Sources of Power on Minnesota Farms	Cavert, W. L.
266	31	1930	1928-29	Cost of Combine Harvesting in Minnesota	Pond, G. A., and Bassett, L. B.
280	87	1931	1928-29	The Farm Tractor in Minnesota	Schwantes A. J. and Pond, G. A.
288	65	1932	1928-30	Relation of Variations in the Human Factor in Financial Returns in Farming	Wilcox, W. W., Boss, A., and Pond, G. A.
353	56	1941	1880-1935	Farm Tenancy in Minnesota	Pond, G. A.
368	19	1943	1941-42	Pasture Production and Use, A Study in Houston County, Minnesota	Anderson, H. G., Welch, C. H. and Pond, G. A.
405	20	1950	1945-47	Starting Farming in Southeastern Minnesota	Beneke, R. R. and Pond, G. A.
428	36	1955	1948-53	Starting Farming Today--Can It Be Done? What Does It Take?	Pond, G. A., Swanson, H. W. and Cavert, W. L.
Totals	698	1916-55	1880-1953		

* Printed by the Agricultural Extension Service; all others published by the Agricultural Experiment Station.

Table 9. Processed reports based on survey and questionnaire studies, 1931-58

Report number	Pages	Year issued	Years covered	Title	Authors
42	18	1931	1928-31	The Relationship of Certain Personal and Family Influences to Operators' Labor Earnings	Wilcox, W. W.
79	20	1936	1936	Report of a Farm Management Survey of 120 Farms in Freeborn, Steele and Waseca Counties	Ranney, W. P. and Pond, G. A.
80	19	1936	1936	Report of a Farm Management Survey of 120 Dairy Farms in Kanabec, Mille Lacs and Pine Cos.	Ranney, W. P. and Pond, G. A.
-	31	1940	1939	Use of Farm Tractors in Minnesota	Nodland, T. R., Schwantes, A. J., and Baumann, R. V.
-	27	1940	1939	The Tractor and Its Effect on Farming in Minnesota	Baumann, R. V., Nodland, T. R., and Pond, G. A.
135	19	1942	1941	Farm Business Analysis of 44 Farms in the Clear Lake Soil Conservation Demonstration Area	Welch, C. H.
143	19	1943	1942	Farm Business Analysis of 30 Farms in the Clear Lake Soil Conservation Demonstration Area	Welch, C. H.
161	13	1947	1946-47	Labor Requirements and Cost for Different Methods of Hay Making	Beneke, R. R. and Engene, S. A.
166	11	1947	1947	The Financial Position of Beginning Farmers	Beneke, R. R. and Nodland, T. R.
173	16	1949	1946-47	The Financial Resources and Earnings of Beginning Farmers	McDaniel, W. E., Vanvig, A. and Nodland, T. R.
188	6	1951	1950	Cost of Operating Some Farm Machines	Nodland, T. R. and Pond, G. A.
196	18	1952	1951	Lease Arrangements in West Central Minnesota	Dennistoun, R. L., Pond, G. A., and Nodland, T. R.
211	16	1953	1953	Starting Farming Today	Swanson, H. W., Pond, G. A. and Cavert, W. L.
213	11	1954	1954	Starting Farming Today: Suggestions and Advice from Successful Farmers	Pond, G. A. and Moore, D. S.
218	19	1954	1954	Farmer Reaction to Corn Allotment and Other Farm Programs	Pond, G. A. and More, D. S.
242	31	1958	1955	Combining Farming with Off-Farm Jobs in Northeastern Minnesota	Hady, F. T.
Totals	294	1931-58	1928-55		

CHAPTER IV. COOPERATIVE FARM MANAGEMENT SERVICES

Cost accounting studies dominated the farm management research program at Minnesota up to 1928. Survey work was used primarily to supplement cost accounts. In 1928 another method of securing farm management data began and, in time, replaced cost accounting as the major source of this data. This method was the cooperative farm management service.

A Farm Bureau-Farm Management Service had been pioneered in Illinois in 1924 by M. L. Mosher, extension specialist in farm management, and H. C. M. Case, head of farm management research at the University of Illinois. The cooperative farm management service idea was unique because it combined research, extension activities, and service to the individual farmer. This Illinois service was supported jointly by research and extension funds. And, since it helped individual farmers, they also contributed to its support. So a cooperative farm management service can include more farms with a given amount of public research funds than is possible with cost accounting studies.

A cooperative farm management service was organized in the fall of 1927 in six southeastern Minnesota counties. The project was begun by research and extension workers in farm management in cooperation with the Bureau of Agricultural Economics, USDA. It was established on a trial basis for 1928-30. Since research dominated the initial phases, farmer members did not pay fees during these first three years. The number of members in 1928, 1929, and 1930 was 124, 172, and 180 respectively.

This initial cooperative farm management service was a trial of the method in order to determine its possibilities and reception by farmers. In other states, similar projects had developed largely as farm management extension activities. But the Minnesota project was designed to develop and perfect the research potential of this kind of a study while still retaining extension activities.

Extension personnel in Minnesota cooperated with research workers by lining up farmer cooperation and organizing the field service. Research workers were responsible for: (1) selecting the particular area to be covered, (2) choosing the type of data to be secured, (3) analyzing and publishing data obtained, and (4) preparing reports--both those going to members for their use and those representing a general research analysis. Extension workers helped select cooperating farmers and assisted them in keeping their records and using them as a guide in farm management. Data secured from these cooperative farm management services were widely used in extension teaching as well as in resident instruction in farm management.

In this project, substantially the same kind of information, except labor records, was obtained as from the detailed accounting studies. To post and analyze labor records from so large a sample would have made the cost prohibitive and few cooperating farmers would have been willing to supply the information. Labor records were being obtained at the time the cooperative farm management services were initiated through cost accounting projects in other areas.

A complete itemized inventory of all farm property on each farm was taken at the beginning and end of each year by the farm operator. All physical items of crop and livestock production were recorded. All items of cash receipts and expenses were also recorded during the year, as were items of farm produce used for family consumption. Expenditures for personal and household purposes were included. Feed consumption by each class of livestock was recorded. Research and extension workers assisted fieldmen in checking records at the end of each year and in collecting additional information needed for analysis. A full-time fieldman visited each farm three or four times a year to help the farmer keep his records and use them as a guide.

Farmers in other sections of the state became interested in this project and requested that a similar service be made available to them. When a suggestion was made to transfer this southeastern Minnesota service to some other

area, members proposed that they be allowed to retain it and that they would share the cost through an annual membership fee. Their offer was accepted by the University of Minnesota and a schedule of fees for the service was prepared. The Southeastern Minnesota Farm Management Association has continued on a fee basis since 1931; fees were raised from time to time as rising costs required (see table 10).

A second association was set up in a corn and meat producing area in southwestern Minnesota in 1940. A group of farmers attending Farm and Home Week at the University heard representatives of the Southeastern Minnesota Farm Management Association. The idea of such an association appealed to them, so a committee of farmers and extension agents in the area contacted the University staff who had organized the southeastern association and who were cooperating with it. They requested a similar cooperative service; an agreement was drawn up providing for a service jointly supported by the two contracting parties: The University and the Southwestern Minnesota Farm Management Association.

Records kept and analyses made were identical for the two associations. Each service had its own officers and directors. Cooperation with farm management personnel was supplied by a management committee representing the association and both the Department of Agricultural Economics and the Agricultural Extension Service. The southwestern association elected to collect and disburse their membership fees through their own treasurer and to reimburse the University for services in analyzing records and preparing member reports (see table 11). Otherwise, the two associations were identical in operation.

As indicated, the Agricultural Extension Service shared with the Department of Agricultural Economics responsibility for maintaining these two services. Extension staff members and county agricultural agents cooperated with farm management research staff in recruiting membership, supervising operations and determining policies. This sharing of support and direction made possible a much more productive

Table 10. Annual membership fees, Southeastern Farm Management Association, 1931-62

Flat rate per farm		Number	Variable rates per farm*					
Years	Fee	of acres	1943-45	1946	1947-48	1949-50	1951	1952-54
1931-32	$ 8	100 or less	$20.00	$25.00	$26.67	$28.80	$30.80	$33.80
1933-35	4	101 - 140	22.00	27.00	29.33	31.68	33.88	36.88
1936-37	6	141 - 180	24.00	29.00	32.00	34.56	36.86	39.96
1938-42	15	191 - 220	26.00	31.00	34.67	37.44	40.04	43.04
		221 - 260	28.00	33.00	37.33	40.32	43.12	46.12
		261 - 300	30.00	35.00	40.00	43.20	46.20	49.20
		301 - 340	32.00	37.00	42.67	46.08	49.28	52.28
		341 - 380	34.00	39.00	45.33	48.96	52.36	55.36
		381 - 420	36.00	41.00	48.00	51.84	55.44	58.44
		Over 420	38.00	43.00	50.67	54.72	58.52	61.52

	Number	Variable rates per farm+				
	of acres	1955	1956-58	1959-60	1961	1962
	140 or less	$40.00	$43.00	$48.00	$50.00	$52.00
	141 - 220	45.00	48.00	53.00	55.00	57.00
	221 - 300	51.00	54.00	59.00	61.00	63.00
	301 - 380	58.00	61.00	66.00	68.00	70.00
	Over 380	65.00	68.00	73.00	75.00	77.00

* $1 deducted for each 40 acres of nontillable land.

\+ $2 deducted for each 100 acres of nontillable land.

Table 11. Annual membership fees, Southwestern Minnesota Farm Management Association, 1940-62

Number of acres	Variable rates per farm*								
	1943-44	1945-46	1947	1948	1949-50	1951	1952-54	1955-59	1960-62
100 or less	$20	$21	$31	$35	$37	$39	$43	$49	$54
101 - 140	22	23	33	37	39	41	45	52	57
141 - 180	24	25	35	39	41	43	47	54	59
181 - 220	26	27	37	41	43	45	49	56	61
221 - 260	28	29	39	43	45	47	51	59	64
261 - 300	30	31	41	45	47	49	53	61	66
301 - 340	32	33	43	47	49	51	55	63	68
341 - 380	34	35	45	49	51	53	57	66	71
381 - 420	36	37	47	51	53	55	59	68	73
Over 420	38	39	49	53	55	57	61	70	75

* From 1940-42, the variable rate was $15 per farm of 80 acres or less, with an additional 5¢ per acre for each acre over 80, up to a maximum fee of $25 for 280 acres or more.

and comprehensive project than either group could have operated independently.

A highly important factor in the success of a cooperative farm management service is a capable fieldman with a broad background of farm experience and real leadership ability. The membership of the southwestern association was somewhat less than that of the southeastern association, due in part to the more rapid turnover of fieldmen. The southwestern association had eight fieldmen in its first 22 years as compared with only three fieldmen in the southeastern association in 34 years (see table 12). A new fieldman needs time to become familiar with his area and build up an acquaintenance with the farmers.

In order to use most effectively a farm management service, a farmer should have continuous records over a period of years. As indicated in tables 13 and 14, more than 20 percent of all farmers who joined an association dropped out at the end of the first year. In both associations more than 50 percent of the members dropped out during their first three years. Farming is a highly dynamic business. Continuous records are needed as a guide for adjusting to current changes in prices, production and techniques. Continuity of membership greatly enhances the value of a farm management service--both to members and to research and extension agencies cooperating with them.

Some membership turnover is due to failure to explain adequately in advance to the prospective member what is involved in record keeping and how to use his records currently. It takes time to learn how to use records effectively as a basis for current adjustments to an ever changing environment. Too often the new member becomes bogged down in the routine of record keeping and overlooks the valuable guidance they can afford him. Only an alert fieldman can avoid this by stressing every opportunity to help members apply records in meeting problems. Age, landlord cooperation, security of tenure, and size of farm business also affect continuity of membership.

All studies of farmers' earnings brings out a wide variation in financial

Table 12. Fieldmen, Southeastern and Southwestern Farm Management Associations

Fieldman	Dates	Length of service Years	Months
Southeastern Farm Management Association			
Bevan, R. C.*	1928 - 5/1/37	9	4
Myers, G. M.	6/1/37 - 5/31/49	12	
Bjerke, H. M.+	6/1/49 - 12/31/61	12	7
Southwestern Farm Management Association			
Huntsinger, R. A.	1/1/40 - 4/20/43	3	4
Burkholder, J. R.	5/1/43 - 8/31/47	4	4
Johnson, D. S.	11/1/47 - 3/15/52	4	4½
Routhe, H. G.	8/1/52 - 6/30/55	2	11
Richter, D.	7/16/55 - 7/31/56	1	½
Calvin, Paul	8/1/56 - 9/6/57	1	1
Stevermer, Gene	10/28/57 - 3/16/61	3	4½
Ross, Lyle+	7/1/61 - 12/31/61		6

* Part-time basis 1/1/33 - 5/1/37

\+ Continuing in 1962.

Table 13. Years of records per individual farm by county groups, Southeastern Minnesota Farm Management Service

Years in Association	County groups										Total records	Percent of total
	Goodhue	Freeborn	Steele	Waseca	Dodge	Rice	Mower, Olmsted	Nicollet, Le Sueur	Wabasha, Winona	Dakota, Scott		
	percent											
1	16.5	20.9	19.0	28.5	33.4	29.7	22.7	10.4	16.7	17.1	175	22.2
2	19.6	18.7	15.8	13.7	22.3	22.6	17.4	13.4	27.1	14.6	145	18.4
3	11.4	10.4	20.0	21.0	8.9	13.1	5.3	13.4	2.1	9.8	97	12.3
4 - 8	26.7	23.0	22.0	17.8	16.7	16.7	22.7	32.8	10.4	22.0	168	21.3
9 - 13	7.2	11.5	9.5	4.2	5.5	7.1	9.3	7.5	8.3	14.6	64	8.1
14 - 18	6.2	2.1	5.3	4.2	4.4	3.6	8.0	4.5	17.1	2.4	43	5.5
19 - 23	3.1	6.2	3.2	6.3	2.2	3.6	13.3	9.0	18.7	17.1	55	7.0
24 - 28	4.1	4.1	3.2	1.1	1.1	2.4	1.3	3.0	-	2.4	19	2.4
29 - 33	5.2	2.1	1.0	1.1	4.4	1.2	-	3.0	-	-	16	2.1
34	-	1.0	1.0	2.1	1.1	-	-	-	-	-	6	0.7
Total number of members	97	96	95	95	90	84	75	67	48	41	788	100.0
Average years per member	6.3	7.1	6.5	5.9	5.7	5.5	7.4	7.9	9.0	4.5	6.8	

Table 14. Years of records per individual farm by county groups, Southwestern Minnesota Farm Management Service

Years in association	Nobles	Faribault, Martin	Redwood	Jackson	Brown, Cottonwood, Watonwan	Lyon, Murray	Lincoln, Pipestone, Rock	Total records	Percent of total
				percent					
1	28.2	19.5	25.7	28.4	26.4	20.3	23.5	142	24.9
2	10.9	19.5	15.4	10.1	18.6	23.4	27.5	97	17.0
3	9.1	13.8	10.1	10.1	14.7	10.9	13.7	67	11.8
4 - 8	20.8	24.2	25.7	27.0	33.3	18.8	21.6	142	24.9
9 - 13	16.4	9.2	9.0	15.4	3.0	17.2	5.9	62	10.9
14 - 18	10.0	5.7	10.2	6.4	2.0	4.7	3.9	36	6.3
19 - 22	4.6	8.1	3.9	2.6	2.0	4.7	3.9	24	4.2
Total number of members	110	87	78	78	102	64	51	570	100.0
Average years per member	6.2	6.0	5.6	5.6	4.1	5.8	4.5	5.4	

success among farmers. In fact, it is from analysis of this range in earnings that the factors determining a farmer's financial success are discovered. Each member in the southeastern and southwestern associations was supplied with this type of information to bring out elements of strength and weakness in his own farm business. Such data also supply basic data needed in planning how best to eliminate existing flaws.

The extent to which the operator can control these factors varies widely from farm to farm. Nevertheless, this "factoring analysis" makes it possible to detect the elements that limit earnings and to concentrate on adjustments to eliminate them.

One important product of these farm management service records is the basic input-output data covering crop and livestock production needed for planning changes in the farm business. If the farmer is planning new enterprises or new methods of production, he needs some idea of the labor, feed, and other requirements. With this information he can budget changes in his organization and compute probable or approximate results. This type of input-output data is also valuable in both resident and extension teaching and for many types of research and extension activities.

Records kept by members of the cooperative farm management services were checked for completeness and accuracy each time the fieldman visited the farm. At the end of the record year, the fieldman or staff members of the Department of Agricultural Economics and the Agricultural Extension Service visited each cooperator. At that time supplementary information was secured from the operator. Records were then brought to the University for a final summary and analysis by the research staff in agricultural economics. Any discrepancies or omissions were referred back to cooperating farmers. Every effort was made to expedite this process in order that the cooperator might receive the analysis of his previous year's operation as a guide for planning adjustments for the coming year.

A preliminary report summarizing results of each individual's farm business in comparison with the average, the high, and the low earnings groups was sent each member. Insofar as time permitted, extension or research personnel visited cooperators to explain the analysis and assist in planning future operations. In order to have results quickly available, annual summaries for each year were prepared as soon as possible after the close of the year.

The annual reports served several purposes. They indicated to each member the degree of success with which he was operating his farm business and various enterprises as compared with other farmers in his general area. Factors that determined or conditioned success were stressed through this comparative analysis. Not only could the members find flaws in his own business but he could avail himself of the advice and counsel of the fieldman and representatives of the cooperating agencies to strengthen the weak spots and stress the strong ones. In a business as complicated as farming, it takes constant study and scrutiny to eliminate errors.

Reports sent each cooperator showed an earnings statement for his farm as compared with the average for the whole association as well as the average for the high 20 percent and the low 20 percent. They also showed his individual rating in the various factors affecting farm financial success as well as that for the high 20 percent and the low 20 percent.

Occasionally, the findings of these studies were published in processed or printed reports for general distribution. Much of the data secured were published as processed reports since they could be made available in much less time and at less expense than printed bulletins (see table 15). In addition to these, data were reported in 13 printed bulletins (see table 16).

Table 15. Processed reports of the Southeastern and Southwestern Minnesota Farm Management Associations

Years of issue	Annual and summary reports				Special reports						Totals--all processed reports	
	Southeastern Association		Southwestern Association		Feeder cattle and sheep		Poultry		Miscellaneous			
	Number	Pages	Number	Pages	Number	Pages	Number	Pages	Number	Pages	Number	Pages
1929-33	17	384	-	-	-	-	-	-	-	-	17	384
1934-38	6	164	-	-	-	-	-	-	-	-	6	164
1939-43	6	166	4	116	-	-	-	-	1	10	11	292
1944-48	5	156	5	160	2	29	-	-	1	31	13	376
1949-53	5	138	6	163	3	41	4	47	-	-	18	389
1954-59	5	141	5	131	6	128	-	-	6	89	22	489
1959-62	5	128	5	106	4	114	-	-	3	39	17	387
Totals	49	1277	25	676	15	312	4	47	11	169	104	2481

Table 16. Printed bulletins based on the Southeastern and Southwestern Minnesota Farm Management Associations

Bulletin number	Pages	Year issued	Years covered	Title	Authors
309	16	1934	1928-32	Suggestion to Purchasers of Farms	Cavert, W. L. and Pond, G. A.
314	83	1934	1928-32	Factors Causing Variations in Earnings Among Dairy Farmers in Southeastern Minnesota	Pond, G. A., Ranney, W. P., and Crickman, C. W.
155*	16	1938	1929-37	A Well Planned Farm Business	Cleland, S. B.
378	24	1944	1928-37	Managing the Dairy Herd for Greater Returns	Nodland, T. R. and Pond, G. A.
379	23	1944	1928-37	Managing Hogs for Greater Returns	Nodland, T. R. and Pond, G. A.
382	12	1945	1928-37	Managing Sheep for Greater Returns	Nodland, T. R. and Pond, G. A.
386	28	1945	1928-37	Why Farm Earnings Vary	Pond, G. A.
409	16	1951	1932-48	Our Changing Poultry Enterprise	Hady, F. T. and Nodland, T. R.
416	20	1953	1932-49	Changes in the Dairy Farm Picture	McDaniel, W. E. and Pond, G. A.
445	28	1957	1940-56	Planning Farms for Increased Profits	Hasbargen, P. R. and Pond, G. A.
446	32	1958	1928-52	The Changing Picture of Farming in Southeastern Minnesota	Pond, G. A. and Nodland, T. R.
449	20	1959	1956-57	Effect of Herd Size on Dairy Chore Labor	Day, L. M., Aune, H. J., and Pond, G. A.
451	16	1960	1956-57	Labor Used in Cattle Feeding	Johnson, R. G. and Nodland, T. R.
Totals	334	1934-59	1928-57		

* This was the only Agricultural Extension Service bulletin; all others were published by the Agricultural Experiment Station.

CHAPTER V. SPECIAL TYPES OF FARM MANAGEMENT RESEARCH STUDIES

The major methods used in gathering farm management research data in Minnesota have been described in previous chapters. In addition, other studies yielding farm management research data were conducted by the farm management research staff, either independently or in cooperation with state or federal agencies.

Special Farm Management Services

These projects were operated under a cooperative agreement with various state and federal agencies. These agencies included the Minnesota Agricultural Extension Service and several federal agencies which supervised groups of farm operators keeping farm account records as a source of data for farm planning and farm advisory service. The farm account records kept by these farmers were similar, but usually not as comprehensive, to those used in the cooperative farm management services. They were subjected to the same general type of analysis, although usually less detailed.

These records, supervised by the sponsoring agency during the year, were given to the Department of Agricultural Economics for summary and analysis at the end of the year. A report was prepared for each farm operator submitting a completed record of his farm operations. This was returned to him by the sponsoring agency as a guide in planning a more profitable business. The study period covered, the number of cooperators, and the number of pages in these area reports are in table 17. The extent to which feed records were a part of the data secured is also indicated.

To facilitate use of these area records by the individual farmers, data for each cooperator were written into his report. Therefore, he could see how he compared in earnings and various success factors with other group members. These data were used by the sponsoring agency in assisting the individual member

Table 17. Special farm management services

Service	Study period	Number of annual members	Processed reports		Feed records	
			Number	Pages	Yes	No
Northern Minnesota	1932-35	165	5	93		x
Rural Resettlement	1936-38	2035	11	178		x
Soil Conservation Service	1936-41	501	7	178	1937-41	1936
Farm Management Service for Tennessee Valley Authority Test Demonstration Cooperators	1940-46	1100	14	320		x
Veterans Farm Management Service	1947-51	1704	19	512	x	
Vocational Agriculture Farm Management Service	1953-61	331	9	194	x	
Northeastern Minnesota Farm Management Service	1955-58	79	4	110	x	
Central Minnesota Farm Management Service for Tennessee Valley Authority Test Demonstration Cooperators	1958-61	92	4	112	x	
Totals	1932-61	6007	73	1697		

to plan his operation and eliminate unprofitable practices. Although these projects were considered primarily research by the Department of Agricultural Economics, they were mainly extension activites from the standpoint of the sponsoring agencies. Nevertheless, these studies provided a source of farm management research data--particularly input-output data--useful in planning improvements on farms in the problem areas covered.

Cost and Performance of Farm Tractors

The farm tractor began to play a major role in farm operation in Minnesota soon after World War I. By the early 1930's, demand was strong for information on the cost of tractor operation, the amount of annual use, and rates of performance for different operations and different sizes of tractors. Therefore, the Department of Agricultural Engineering contacted farmers who were willing to record the cost of operating their tractors and the rates of performance for various operations.

These data were assembled and summarized by the Department of Agricultural Economics for the three most common size groups of tractors for 1933-41. Nine annual processed reports totalling 75 pages were prepared covering this study. Data presented provided valuable information to farmers who were considering a shift from horse to tractor power or who needed help in deciding the tractor size best adapted to their needs.

Type-of-Farming Studies

Farms differ greatly in type among areas in the state due to variations in natural and economic conditions. While many types may occur in each area, these conditions do result in the concentration of certain types within certain areas. Knowledge of these concentrations makes it possible to allocate research

Table 18. Experiment Station bulletins covering type-of-farming area studies

Bulletin number	Pages	Year issued	Years covered	Title	Authors
257	36	1929	1850-1925	Types of Farming in Minnesota	Garey, L. F.
268	20	1930	1879-1925	Systems of Farming in Northern Minnesota	Garey, L. F. and Elliott, F. F.
276	50	1931	1879-1925	Systems of Farming in Eastern and Southern Minnesota	Garey, L. F. and Elliott, F. F.
347	71	1940	1917-36	Agricultural Production and Types of Farming in Minnesota	Engene, S. A. and Pond, G. A.
347 suppl.	28	1944	1917-42	Statistical Supplement--Agricultural Production and Types of Farming in Minnesota	Engene, S. A. and Pond, G. A.
439	27	1957	1949	Distribution of Grassland in Minnesota	Hady, F. T. and Engene, S. A.
Total	232	1929-57	1850-1949		

and extension activities adapted to the kind of farms prevailing in an area. Table 18 lists the printed bulletins covering type-of-farming studies. In addition to these printed reports, a processed report, Ag. Econ. 234, Major Types of Farming in Southern Minnesota, by T. R. Nodland, G. A. Pond, and D. E. Erickson, was issued in 1957.

Special Farm Management Research Publications

In addition to the farm management research studies already mentioned, many publications covered miscellaneous farm management analyses that did not fit well into any research class already covered (see tables 19 and 20). In many cases they were based on data drawn from a variety of sources.

Table 19. Experiment station bulletins based on special studies

Bulletin number	Source of data	Pages	Year issued	Years covered	Title	Authors
457	Labor records	40	1962	1958-59	Alternate Dairy Chore Systems in in Loose Housing	Fuller, E. I. and Jensen, H. R.
459	Survey and labor records	26	1962	1959-60	Profitable Adjustments in Farming in East Central Minnesota	Day, L. M., Sundquist, W. B. and Jensen, H. R.
460	Survey	32	1962	1959	Alternatives in Farming in Central Minnesota	Sundquist, W. B., Day, L. M., and Jensen, H. R.
Total		98	1962	1958-60		

Table 20. Processed reports based on special studies

Report number	Source of data	Pages	Year issued	Years covered	Title	Authors
112	U. S. Census	10	1939	1917-37	A Study of Reported Crop Yields in Southern Minnesota	Anderson, H. O.
219	Southwestern Farm Management Service	21	1954	1943-52	Some Factors Affecting the Earnings of Farmers in Southwestern Minnesota	Nodland, T. R. and Pond, G. A.
220	Veteran's Farm Management Service	16	1954	1947-51	Starting Farming, Ownership vs. Renting	Nodland, T. R. and Moore, D. S.
235	Farm Management Services	11	1958	1954-56	Comparative Return from Crops--Southern and West Central Minnesota	Nodland, T. R. and Pond, G. A.
248	Southeastern and Southwestern Farm Management Services	10	1959	1928-57	Farm Real Estate Valuation Problems Incurred by Minnesota Farm Management Associations	Pond, G. A. and Nodland, T. R.
255	State Farm Census and Farm Management Services	13	1960	1940-57	Some Trends in Farm Production in Southern Minnesota	Pond, G. A., Nodland, T. R., and Erickson, D. E.
Totals		81	1939-60	1917-57		

CHAPTER VI. DEVELOPMENTS IN FARM MANAGEMENT RESEARCH IN THE NORTH CENTRAL STATES AND NEW YORK

Early Farm Management Research in Area

This chapter deals with the beginning of and some recent developments in farm management research in the North Central States and New York. A substantial share of early farm management research in the United States was conducted in these states. This area has perhaps more homogeneity of natural and economic conditions than can be found elsewhere in the country.

Illinois

Some of the earliest farm management research was initiated in Illinois. The Illinois State Department of Agriculture made a mail-questionnaire study of the cost of producing cereals; replies were received from 28,000 individuals. In 1897 the Illinois Agricultural Experiment Station sent out 900 questionnaires on the cost of producing corn and oats and received 316 replies. Results were published in Illinois Agricultural Experiment Station Bulletin 50 in February 1898.

In the summer of 1911, the Office of Farm Management, Bureau of Plant Industry, USDA, made a farm business analysis survey of farms in Illinois, Indiana, and Iowa. Seventy-three farmers in Menard and Cass Counties in Illinois were included; results were published in USDA Bulletin 41, A Farm Management Survey of Three Representative Areas in Indiana, Iowa, by E. H. Thompson and H. M. Dixon.

Detailed cost accounting studies were initiated by the Illinois Agricultural Experiment Station in 1912. The early work was in the Department of Animal Husbandry and was supervised by W. F. Handschin who had had experience with farm cost accounting under Boss at Minnesota. Some cost accounting studies in dairy production were initiated at about the same time by F. A. Pearson in the dairy department at Illinois.

In 1917, a Department of Farm Organization and Management was created with

Handschin as head; the cost accounting work was continued in this department up to 1932. Then a Department of Agricultural Economics was established which took over farm management research activities. This department was headed by Case, who had succeeded Handschin in 1922.[7]

In 1925, Illinois made a substantial and valuable contribution to farm management research and extension in the development of the Farm Bureau-Farm Management Service of supervised farm accounting under Case and Mosher.[7] This service had been in the process of development by these men since about 1916. Although started as an adult education project, it proved valuable as a source of data for research analysis. The cooperative farm management services in Minnesota were patterned after the Farm Bureau-Farm Management Service but with more stress on research purposes.

Furthermore, the success of the Minnesota services was due partly to the services of Willard P. Ranney. Ranney had been a cooperator of the Illinois Farm Bureau-Farm Management Service and later was employed in the Urbana office where records were analyzed and reports prepared. He was bought to Minnesota to assist in setting up the field service, the process of analyzing records, and the preparation of reports for members and for general distribution. Such an inter-institutional exchange of training and experience is invaluable in speeding up adoption of new techniques and types of research analysis.

Nebraska

An early farm management study of Nebraska was reported in Nebraska Agricultural Experiment Station Bulletin 29, Cost of Farm Crops, by C. S. Ingersoll and S. W. Perrin. Basic data were taken from physical input data covering operations done at the Nebraska Agricultural Experiment Station in 1891-92. In

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7. Taylor, H. C. and A. D. Taylor, 1952. The Story of Agricultural Economics, pp. 402-03.

1909-11, a questionnaire study of the cost of growing crops was made. Data secured were published in 1911 in Nebraska Agricultural Experiment Station Bulletin 122, Cost of Growing Crops in Nebraska, by C. W. Pugsley. A farm business analysis survey of farms in Platte, Merrick, Madison, and Richardson Counties was made for the years 1911-14. Results were published in Nebraska Agricultural Experiment Station Bulletin 157, Farm Management Studies in Eastern Nebraska, by H. C. Filley. Nebraska Agricultural Experiment Station Research Bulletin No. 15, Farm Types in Nebraska as Determined by Climate, Soil, and Economic Factors, by R. R. Spafford, was published in 1919.

In addition to these studies the Nebraska Agricultural Experiment Station and the Bureau of Animal Industry, USDA, cooperated in a study of the cost of producing milk in eastern Nebraska in 1917. This study was reported in September 1921 by J. B. Bain, G. E. Braun, and E. G. Gannon in USDA Bulletin 972, Unit Requirements for Producing Market Milk in Eastern Nebraska.

Ohio

Farm management research at the Ohio Agricultural Experiment Station was initiated in 1904 by L. H. Goddard in the Department of Cooperative Experiments. In 1906, some cost accounting studies were started on 20 farms and some labor and feed accounts were begun on several dairy farms. The first publications were: Ohio Agricultural Experiment Station Circular 98, Minor Items of Farm Equipment, by L. W. Ellis in cooperation with USDA, February 1910; and Ohio Agricultural Experiment Station Bulletin 227, A Study of Farm Equipment, also by Ellis, February 1911.

Some farm management survey work was done in 1915. Results were published in 1916 in Volume XI, No. 2, of the Agricultural Extension Service, Ohio State University under the title, "Some Results of the Farm Management Survey in Geauga County, Ohio." The authors were J. I. Falconer, who succeeded Goddard, and L. L.

Allen, a county agricultural agent. Detailed cost accounts were resumed in 1920 under the direction of Falconer and his associates, F. L. Morrison and J. F. Dowler.

The Office of Farm Management and Farm Economics, USDA, surveyed 25 farms in Washington County, Ohio in 1912-18. Results were published in December 1920 in USDA Bulletin 920, Farm Profits by H. M. Dixon and H. W. Hawthorne.

New York

New York was included with the north-central states in this study because of its pioneer work in farm management research, its diversified program in the field, and its development of the farm survey as a source of data for farm management research analysis. The general principle of the farm business analysis survey was pioneered in Cornell Agricultural Experiment Station Bulletin 295, An Agricultural Survey--Townships of Ithaca, Dryden, Danby, and Lansing, Tompkins County, New York, March 1911, by Warren and Livermore. As author of Part I of Cornell Agricultural Experiment Station Bulletin 226, March 1905, Warren developed the general type of analysis used in the farm management survey--either the cost survey or the farm business analysis survey. He applied it also in Cornell Bulletin 229. In 1914, Warren published Cornell Agricultural Experiment Station Bulletin 344, Agricultural Surveys. This was followed in July of that year by Cornell Bulletin 349, Some Important Factors for Success in General Farming and Dairying.

The use of the farm survey in cost of production studies was illustrated in 1915 in Cornell Bulletin 364, Cost of Producing Milk on 174 Farms in Delaware County, New York, by A. F. Thompson. A similar study in the field of crop costs was published by D. S. Fox in May 1919 as Cornell Experiment Station Memoir 22, An Analysis of the Cost of Growing Potatoes. In 1921, W. I. Meyers published An Economic Study of Farm Tractors in New York based on a survey covering the

year ending March 1, 1920. This was followed by Cornell Agricultural Experiment Station Bulletin 409, An Economic Study of Dairying on 149 Farms in Broome County, New York, by E. G. Misner. It was based on 149 survey records for the year ending May 1, 1915.

In December 1922, Cornell Agricultural Experiment Station Bulletin 412, An Economic Study of the Production of Canning Crops in New York, was published by L. J. Norton. This was based on 56 cost accounts and 206 survey records for 1920. The farm management research publications from Cornell University in the general field of farm management are too numerous to list. Perhaps it is sufficient to say Warren and his associates contributed significantly to the field of farm management research analysis.

Wisconsin

The early work in farm management research in Wisconsin was a farm cost accounting study. It was conducted under an informal agreement between H. C. Taylor of the University of Wisconsin and Peck of the Office of Farm Management, USDA. Cooperating farmers were scattered about the state rather than concentrated in groups or routes, as was the case in Minnesota. Both field supervision and tabulation in the Madison office were directed by O. A. Juve. This study was designed primarily to supply basic data needed to answer questions of "what to produce" and "how to produce it." These cost accounts included daily labor records, feeding records, and financial and other accounts. This study covered the years 1908-14 with about 17 farms per year.

Another important type of farm management research at Wisconsin was the farm business analysis survey under Daniel H. Otis during 1909-17. This survey covered some 100-200 records each year.

In addition to the farm management research work of the Wisconsin experiment station, 60 farms were covered in a farm business analysis survey, 1913-17, by the

Office of Farm Management and Farm Economics, USDA. Results were published in 1920 in USDA Bulletin 920, Farm Profits, by Dixon and Hawthorne.

Missouri

D. H. Doane initiated farm management survey work in Missouri for USDA in 1908. In 1910, he was appointed head of the newly created Department of Farm Management with O. R. Johnson as his assistant. The first research project was a cost accounting study started in 1911 by Johnson, who succeeded Doane, and W. E. Foard. Results were reported in Missouri Agricultural Experiment Station Bulletin 125 in 1915.

Other bulletins based on cost accounting studies were published in 1918 covering the year 1917. During 1910-20, six bulletins based on farm survey records and including 208 pages were printed. During this same period, four bulletins based on cost accounts and including 126 pages were issued. Cost accounting studies in Missouri were operated under a joint project with USDA.

Indiana

Early farm management research in Indiana was done by federal agencies. The first farm business analysis survey of 123 farms in Clinton and Tifton Counties was made in 1911. This study was directed by the Office of Farm Management, Bureau of Plant Industry, USDA. Findings were reported in USDA Bulletin 41, A Farm Management Survey of Three Representative Areas in Indiana, Illinois, and Iowa, by Thompson and Dixon.

Another survey of 100 farms for 7 years was made by Dixon and Hawthorne of the Office of Farm Management in Clinton County in 1910 and 1913-18. Results were presented in USDA Bulletin 920, together with similar survey data for Washington County, Ohio for the years 1912-18 and for Dane County, Wisconsin for the years 1913-17.

A farm management department in the Indiana Agricultural Experiment

Station was established in 1920. Cost accounting studies were initiated in 1922 under the direction of E. C. Young.

Iowa

Most early farm management studies in Iowa were farm business analysis surveys. The first was a farm management survey covering 77 farms in Green and Guthrie Counties. It was conducted by the Office of Farm Management, Bureau of Plant Industry, USDA in 1911. Findings were published as USDA Bulletin 41 by Thompson and Dixon.

An early farm management research study of the Iowa Agricultural Experiment Station was a survey of farm lease terms on 114 farms made in 1913 by O. G. Lloyd. Findings were published in 1915 as Experiment Station Bulletin 159, Farm Leases in Iowa. H. B. Munger made a survey study of milk production costs for 900 dairy cows for the year starting November 1, 1916. His results were published in January 1921 as Iowa Agricultural Experiment Station Bulletin 197, The Cost of Producing Milk. Munger also surveyed 965 dairy farms for the year starting March 1, 1913 and 210 farms for the year starting March 1, 1918. Results were published in March 1921 as Iowa Agricultural Experiment Station Bulletin 198, Iowa Farm Management Surveys--Blackhawk, Grunding and Tama Counties.

Other farm survey studies in Iowa were reported in Iowa Agricultural Experiment Station Bulletin 229, Farm Organization and Management Studies in Warren County, Iowa, by C. W. Crickman. This covered the findings of 832 farm surveys for the year starting March 1, 1915, 177 for the year starting March 1, 1918, and 231 for the year starting March 1, 1921. Surveys in the earlier years were directed by Munger and those in 1921 by Crickman.

North Dakota

An early farm management study in North Dakota was published in 1913 as North Dakota Agricultural Experiment Station Bulletin 104, Cost of Producing Farm Crops,

by W. R. Porter. It was based on data from demonstration farms in North Dakota supplemented with data from a cost accounting study in Norman County, Minnesota.

The second farm management study was North Dakota Agricultural Experiment Station Bulletin 142, The Cost of Producing Wheat and Other Crops in North Dakota in 1919, by Rex Willard. This was based on: (1) data from a cost of production survey of 250 North Dakota farms in five counties in 1919, (2) a cost of production survey by the Office of Farm Management, USDA covering 78 farmers in Grand Forks and Morton Counties, and (3) 36 cost accounting records from eight North Dakota counties.

A third farm management publication was North Dakota Agricultural Experiment Station Bulletin 144, Cost of Producing Wheat and Other Crops in North Dakota in 1920, by Willard, Hutzel Metzger, and Emma Skeen. It was published in January 1921. Data were obtained from a group survey of 619 farms in 11 counties and from 22 cost records supplemented by a survey.

Michigan

Early research studies concerning farm management in Michigan State University (then Michigan Agricultural College) were conducted in the Department of Dairy Husbandry. The first publication, in December 1916, was Michigan Agricultural Experiment Station Bulletin 277, Studies in the Cost of Milk Production, by A. C. Anderson and F. T. Riddell. This study was based on enterprise cost accounts kept by the dairy department on 25 farms for 1913-16. This study was followed by Michigan Agricultural Experiment Station Bulletin 386, Studies in the Cost of Milk Production, No. 2, published in January 1920. This report covered cost accounts on 125 farms for 1916-19.

Early activities in farm management extension and related research started in 1913 with the appointment of C. P. Reed. In cooperation with USDA and county agricultural agents, Reed obtained farm management survey records on 50-100

farms in four counties in 1914. Similar surveys were also made in three more counties in 1915. The survey records were summarized, analyzed, and returned to the farmer cooperators. In addition, four to six farm management meetings were held in each project county to discuss with farmers the reasons for variations in earnings between the high income and low income farm groups. The farm record project was continued by a farm management specialist through 1920, when it was discontinued as a major endeavor.

A farm management department was established in June 1921 under Howard M. Eliot, professor of farm management. At that time the research work related to business and finance records, total farm basis, was shifted to cost studies to determine: (1) "The relative profitableness of the various types of farming in Michigan;" (2) "The relative profitableness of various combinations of crops and livestock within each type;" and (3) "to determine the best order of investment as the manager progresses in a financial way."[8] This work was under the immediate charge of Riddell who was transferred from the dairy department to farm management. Four cost routes with 20-24 farmers in each route were established in 1921. One route was on dairy farms, one on general farms, another on feeder farms, and one on potato farms.

At the same time, 1921, a poultry enterprise cost survey was conducted in southern Michigan. Results were reported by Eliot in the Michigan Agricultural Experiment Quarterly Bulletin, Volume 5, No. 4, May 1923. An analysis was on the basis of direct costs--all cost items except for real estate and the farmer's own labor--and enterprise returns.

Kansas

An early farm management study in Kansas was reported in Kansas Agricultural Experiment Station Bulletin 221, Farm Leases, by W. E. Grimes in June 1919. This

8. Letter from E. B. Hill, Michigan State University.

was a survey study covering 529 landowners and 433 tenants for 1914-16.

In 1920, Grimes organized two cost accounting routes in Jackson and Mcpherson Counties.

The North Central Regional Farm Management Research Committee

The beginnings of farm management research in the North Central States and New York have been discussed. This section deals with a new organization that developed in the late 1940's and has been an important factor in coordinating farm management research studies in this area and in developing new techniques. In April 1946 Peck and Joseph Ackerman of the Farm Foundation, Sherman Johnson of the Bureau of Agricultural Economics, William L. Cavert of the Farm Credit Administration, Case of the University of Illinois, and Walter Wilcox of the University of Wisconsin met in St. Paul with Boss, S. A. Engene, and G. A. Pond of the University of Minnesota. This meeting formulated a request to the Farm Foundation for the establishment of a North Central Regional Farm Management Research Committee.

The Farm Foundation scheduled an organization meeting for September 12-14, 1948 at Madison, Wisconsin. Forty representatives of the north central states then met and laid the foundation for a farm management research committee in this area in collaboration with the Farm Foundation. Meeting with this group were three representatives of the Bureau of Agricultural Economics, three representatives of the Federal Extension Service, and Ackerman and Peck of the Farm Founation. Included in this group were the 12 north central states, New York and Kentucky. New York was later included in a Northeastern Regional Farm Management Research Committee.

This regional farm management research committee has met twice a year to review current projects in farm management research in the area and to study techniques in collecting, analyzing, and publishing farm management research

data. The Farm Foundation has continued to bear the expense of bringing this group together and to exercise definite leadership in encouraging group research activities.

Since 1948, an experiment station director has been selected as administrative adviser and has attended meetings of this regional committee. At least one representative of the Bureau of Agricultural Economics has attended all regular meetings, as have representatives of the Farm Foundation. The average attendance at the regular semiannual meetings has been 21, of whom 16 have been state representatives.

Cooperation of the Farm Foundation in organizing the committee and in providing funds for meetings and discussion groups has been a highly significant factor in increasing the quantity and quality of farm management research in the north central area. By group conferences and the pooling of resources and experiences, both the quality and quantity of farm management research in Minnesota and the region has increased.

Two Minnesota publications were made possible by the cooperative studies involving regional cooperation. The first was Minnesota Agricultural Experiment Station Bulletin 389 (NCR5), Capital Needed to Farm in the Midwest, January 1946. This was the work of a subcommittee representing seven north central states and the Farm Credit Administration, 7th district. The other was Minnesota Technical Bulletin 219 (NCR64), Farm Accounts as a Source of Data for Farm Management Research. This later study covered work in the 12 north central states and Kentucky. Table 21 lists other regional publications for this area.

Table 21. Regional publications sponsored by the North Central Regional Farm Management Research Committee

NCR publication number	State	State number	Date of issue	Title
4	Iowa	P. 72	March 1945	Preventing Land Price Inflation in the Midwest
11	Michigan	Spec. 349	June 1948	Farm Land Prices in the Midwest
12	Michigan	Spec. 35	June 1948	Public Land Ownership in the Lake States
13	Iowa	361	June 1949	Farm Ownership in the Midwest
14	Kentucky	Cir. 65	Nov. 1949	Can You Own Your Own Farm?
17	Michigan	Exp. Sta. 368	Jan. 1951	Family Farm Operating Agreements
23	Ohio	Spec. Cir. 86	July 1951	Conservation Problems and Achievements on Selected Midwest Farms
28	Missouri	Exp. Sta. 574	June 1952	Obstacles to Conservation on Midwest Farms
44	Iowa	Exp. Sta. 403	Dec. 1953	Economics of Soil Conservation
48	Purdue	Exp. Sta. 623	April 1955	Economics of Forage Valuation
54	Wisconsin	Exp. Sta. 508	Dec. 1954	Profitable Use of Fertilizer in the Midwest
57	Nebraska	Exp. Sta. 429	April 1955	Economics of Cropping Systems in the Corn Belt
63	Missouri	Exp. Sta. 660	Sept. 1955	Problems of Small Farms

CHAPTER VII. SUMMARY AND REVIEW

A General Consideration

Research is primarily a fact finding process, a study of cause and effect, a search for knowledge of factors conditioning or determining the success of certain programs or procedures.

The previous chapters have given the factual information about research projects carried out in Minnesota; the information can easily be documented and verified. Behind these research projects, however, lie the thinking and the training of many men. The full significance of these projects can be interpreted only in the light of the objectives and limitations of those planning and implementing the research. Much information has never been recorded. Nevertheless, the senior author was personally acquainted with many individuals who planned and directed these studies. He himself has been a part of this research program since January 1915. Two of the junior authors have participated in these studies for more than half of the 60 years covered. The experience of these men provides a memory basis for formulating some reliable "hunches" as to the thinking and motives of those who planned the pioneer stages of these studies.

When formal instruction in agriculture was set up under the Morrill Act of 1862, no research agency existed to supply a factual basis for instruction. Not until 25 years later did Congress pass the Hatch Act providing $15,000 to each state for an agricultural experiment station.

Staff members of experiment stations set up under the Hatch Act were largely generalists rather than specialists. Experience in research was limited in most cases, if not altogether lacking. Their training and interests maily concerned crop and livestock production; this, naturally, was reflected in the pioneer research projects they initiated.

Pioneer Crop Rotation Studies

One of the first research projects initiated in Minnesota under the Hatch Act was a series of crop rotation plot studies laid out in 1893 by Hays and Boss. Discussions with Boss indicated that the rotations were planned in order to help solve practical problems: What were the best types of rotations for Minnesota farmers? Which were the most profitable crops to be included in these rotations? Probably Boss and Hays believed that information about relative crop yields from these rotations would answer these questions.

These rotation studies gave valuable information about the relationship of crop yields to crop rotations. But research workers soon realized that costs were also important in determining profits. To provide these cost data they kept a record of costs involved in raising crops on these plots. However, they soon were aware that costs on one-tenth acre plots were not representative of costs on a field or farm scale. They never published results; the findings were apparently discarded.

Cost Accounts--A Pioneer in Farm Management Research

The two researchers, still believing that cost data would be valuable, hit upon the idea of obtaining them from farmers. The cost accounting projects already discussed were initiated to meet these needs. The agronomic background of the workers and the concern about crops were shown in the fact that only cost data for crops were gathered initially. But records were expanded in 1904 to include livestock as well, in order to cover both aspects of the farm business.

No records of the basic philosophy underlying the planning of this project exist but the nature of the data collected and the uses made of them give valuable clues. Average costs for each crop were calculated. These costs were computed by dividing the total costs on all farms by total acreage or total

production. Costs were never calculated for individual farmers. These early researchers probably believed that a "representative" cost for the community could be obtained and that this figure would enable a farmer to determine the cost and, by comparison with the selling price, the profit for his crop. This hypothesis is supported by the fact that fieldmen were instructed to avoid giving any data to the farmers or discussing farm plans and problems with them. Project leaders apparently believed that such discussions and advice would modify costs and earnings on the study farms and, thereby, destroy the representativeness of the sample.

This stress on representative costs continued until these projects were dropped during World War I in 1917. No change was made, although the realization had come that these data were not serving their full purpose and that other research philosophies might prove more useful. Several factors may have been responsible for this: (1) inertia frequently keeps projects in operation even though their usefulness has diminished or ended. (2) Hays left Minnesota in 1905 and Boss assumed other duties within the experiment station that limited his supervision of the cost accounting studies. Furthermore, routine work on these studies was delegated to students and clerical workers who lacked authority to make important or radical changes in procedures even if they recognized the need for them.

Cost Accounting Studies Resumed and Re-oriented

All farm management research projects were closed at the end of 1917 or in early 1918. Definite plans were laid in 1919 for a resumption of cost accounting studies in 1920. Boss was still in charge of farm management research at Minnesota. Peck had resigned in 1919 to accept a position in USDA. The senior author of this report succeeded Peck at Minnesota and was in charge of cost accounting studies under Boss. These three men, carried over from the prewar studies, planned some radical changes in the objectives and methodology of cost accounting studies.

These changes were based on: (1) their experience with the earlier studies, (2) recognition of changes in basic objectives, and (3) different attitudes toward and interest in farm management research on the part of farmers generally.

Reference has been made to a test study in farm cost accounting on a small sample of Minnesota farms. This general plan was used as the basis for the cost accounting studies initiated in 1920. The number of cooperators per route was increased to 20 or more. Most records--inventories, cash accounts, and feed records--were kept, at least in part, by the cooperators under the general guidance of the fieldman. The other radical change from the early study was that all cooperators were supplied copies of the information secured--the facts for their farm and comparisons with group averages. Fieldmen and extension workers helped members use this information in planning their operations and checking results.

This method was a complete reversal from the emphasis on area averages that dominated the earlier studies. The new emphasis was on factors that determined or conditioned financial success for the farm as a whole and for enterprises and operations making up the farm business. Every effort was made to use the findings on the farms supplying the information as a guide to better management.

The route plan of cost accounts was continued with groups of cooperators in various parts of the state up to 1946. These route studies privided data useful for research purposes but the high cost per farm limited the number of farms that could be covered with available funds. With the introduction of the cooperative farm management services in 1928 and 1940 and with occasional questionnaires or other special studies, cost accounts as a source of research data could be largely eliminated.

Farm Management Research in Corn Belt and Lake States

This report mainly concerned farm management research in Minnesota. But no state is so isolated that its research program is not influenced by programs in other states. While Minnesota was pioneering and developing cost accounts, Warren and his coworkers were developing and perfecting the survey method. Later, Case and Mosher developed the cooperative farm management service project. No one individual or state has a monopoly of talent or methodology.

Through the American Farm Management Association and its successor, the American Farm Economic Association, facts about these state research activities were discussed. Exchange of personnel between institutions further facilitated the spread of research techniques. For example, Minnesota's first farm business analysis survey was supervised by a man who had learned his survey technique under Warren at Cornell University.

Regional Cooperation in Research Planning

Most state research workers also have teaching duties that limit their opportunity to profit by firsthand information or observation the research under way in other states. They lack the time as well as the funds to visit these other states. Recognizing this fact, the Farm Foundation of Chicago called a meeting of farm management workers in the north central states in 1948. At this time a North Central Farm Management Research Committee was formed. This organization has met for two or three days twice a year in Chicago with the expenses of a representative of each state borne by the Farm Foundation. This opportunity to discuss problems and research techniques in farm management and to exchange experiences has helped step up the quantity and quality of farm management research in this general area.

The authors of this report can visualize no return to the type of cost accounts that dominated the research picture in Minnesota from 1902 through the middle 1940's.

The survey should retain its place as a means of studying new developments and techniques as they come into farm practice. It should provide data on labor and other inputs under new practices, new techniques, and new production programs. The cooperative farm management service seems likely to retain an important place in future farm management research programs in Minnesota.