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FARM ACCOUNTING IN ILLINOIS

H. C. M. CASE

UNIVERSITY OF ILLINOIS, URBANA, ILLINOIS

AS AN introduction, I will say that except for the progress of the program up to the present I would have followed quite closely a formal paper which was published in the Journal of Farm Economics in 1928. With your permission, however, I shall give a less formal discussion touching upon only a portion of that statement.

The objective at the basis of our program of research is "to aid farmers to improve the organization of individual farms." In order to accomplish this purpose the plan of research must approach the problem in a way which will appeal to farmers both from the standpoint of results obtained and from the standpoint of their application. In most educational work there is a gap between the research results and their application to farming.

In stating the objective in this way it is recognized, of course, that the farmer is confronted by two sets of forces, namely, those which affect the production on his own farm, and those which affect the market for his product. As an individual he can have a direct effect on the former but the effect he can have on the general level of the market is dependent upon the cooperation of farmers as a group. Again, in stressing the material side of farming it is emphasized that it is only a means to an end and that farming should provide a good standard of living for the individual and the community.

An increasing number of our farmers are ready to accept well-grounded recommendations based upon the laboratory and experimental research of our agricultural experiment stations. The depicting of facts shown in the production and financial results on the farms in any community, and the setting forth of these results, puts reality into farm organization work, especially when the facts bear out the results of experiment station research under controlled or partially controlled conditions.

It is not believed that a successful plan of farm organization research adapted to one region is necessarily best adapted to another. Differences in the agricultural production, and in the possible production, of different regions, as well as differences in the

size of farms and in the characteristics of farmers, may materially affect the most satisfactory plan of research in different areas. Farm organization research has gone far enough to show that in most regions desirable systems of farming place emphasis on one, two or three final products which are the basis for the entire organization of the farm, selecting such other enterprises as may have desirable complementary and supplementary relationships. The study of farming over wide areas or even within a single state shows that there are a large number of farming-type areas which differ in the major sources of income. These differences may be attributed to natural, biological and artificial factors. Within each there are, of course, many types of farming, but a particular type of production seems to predominate. We may be assured that this prevailing type of farming was quite well adapted to local conditions at some time but whether or not it is adapted to present conditions is the object of our research program.

This may be illustrated, for example, by referring to a particular state. In Illinois a careful study of products from farms in the different parts of the state shows that there are eight areas that show important differences in the prevailing type of farming, although within each area many types of farming are found. Some of the differences are wide variations in crops produced which are largely due to natural factors, such as fertility of the soil, the ease with which it is tilled, the length of the growing season, the amount of rainfall and the topography. The crops adapted to the natural conditions play no small part in determining the kinds of livestock produced. Biological factors, such as disease and insect damage, may be either temporary or permanent factors influencing the type of production. Factors of the artificial or man-made type, include transportation, size and location of available markets, labor supply, credit facilities, competing regions, character of people, legislation, and last but not least, the introduction of new enterprises. The combined effect of these and many more natural, biological and artificial factors, all of which have an economic bearing, indicate that changes in the organization of farms in one area to meet economic conditions are not necessarily indications of what changes should be made in another area. Each area may well be considered a separate unit for farm organization research. The greater the difference between these areas, the greater the justification for putting on, within each,

special studies designed to obtain farm organization facts specifically applying to the area in question. Furthermore, it should be recognized that within each area, there may be several successful systems of farming. If for no other reason, this may be due to the fact that all farmers are not equally adapted to doing the same thing and it would be an error to recommend that they follow too closely the same plan of production. Based upon previous research conducted in Illinois, it seems that there are a few fundamental underlying successful farm conditions that may even be designated as principles of farm management, and that a well-rounded research program should attempt to show the application of these principles to the farming practice of the region under consideration. As applied to Illinois, these principles may be stated as follows:

1. Good yields tend to reduce the unit cost of producing farm crops.
2. A large percentage of land in the higher profit crops means larger profits.
3. Livestock production as a means of marketing crops makes for larger farm income.
4. Efficient feeding and handling of livestock materially reduces cost of production.
5. A large volume of business is necessary for profitable farming.
6. A well-organized system of crop and livestock production helps use available man labor advantageously.
7. Costs are reduced when the supply of horse and mechanical power fits the farm needs and is economically handled.
8. Buildings, machinery, and other equipment expense must be kept under control if low production costs are to be obtained.
9. A good farm layout and a well-developed farmstead make for economical operation.
10. Diversity of crop production helps to insure long-time profits.
11. Production planned in accordance with market demands makes for a larger margin of profit.

METHODS OF SECURING PRIMARY DATA

After having recognized the principles of good farm organization applying to any area in greater or less degree, it is just as

important that the adaptability of the different methods of farm research be fully recognized before setting up a farm organization study. Research which is being promoted by various farm management investigators shows that different groups place varying degrees of emphasis on different methods of research. No doubt this difference in emphasis frequently indicates a recognition of the specific adaptability of certain research to existing conditions. On the other hand, it is conceivable that some emphasis is placed on certain methods of research because of the training, preference, or prejudices of the investigators.

Farm organization research has advanced to a point where it should be possible to distinguish points of strength and weakness in the various methods at our disposal in attaining the objective of the research project. It is well to think through to the final solution of the problem and to associate those methods of research which will ultimately provide the information needed to set forth clearly the salient principles pertaining to successful farm organization of the region, rather than to rely upon the facts secured from a single method. It should be recognized, of course, that the worker frequently is placed in a position of showing the best results he can with a limited budget and that his administrative superior wants results before additional funds are available.

A résumé of farm management investigations in the United States indicates that the research worker has at his disposal four well recognized methods, namely (1) detailed farm cost of production studies, (2) the farm business surveys, (3) farm financial and production records, and (4) enterprise cost of production studies. In addition, there are various intermediate methods, such as farm power studies, or studies of a particular practice, such as harvesting grain with combines which may call into use certain features of different methods.

DETAILED COST OF PRODUCTION STUDIES

Detailed cost of production studies, begun in Minnesota in 1901 and continued under the methods of research developed during the next few years, stand out as the first method of careful farm organization research. The possibility of obtaining basic facts regarding the material requirements of production of various farm products, by the detailed cost of production method, is too well recognized to require comment. The material requirements of

production, together with the distribution of labor, power, and equipment used, is basic in showing the plan of a well-balanced farm operating unit. Also, detailed farm cost of production data are invaluable in showing the complementary and supplementary relationships of enterprises. While the value of such studies in determining the money cost of producing farm products has been questioned, it seems that cost studies are of fundamental value in determining the relative profitableness of enterprises, especially where the enterprises are of a competing nature.

As Dr. Taylor brought out, the research worker is concerned only with the costs which differ when competing enterprises are concerned. Even in comparing non-competing enterprises such as Indian corn and oats, one need not be concerned with fixed costs such as rent. From the standpoint, however, of placing the results before farmers, it is embarrassing to discuss costs and then explain that part of the costs are left out. Therefore, we have determined a total money cost of production but have not disputed with anyone as to how we should determine certain items such as rent. There are reasons in Illinois why acre costs and unit costs are most useful. At one time the return for an hour of labor was considered useful. Recently the introduction of more machinery has brought about wider differences in farm practice. Most farmers employ some labor in addition to their own but mechanical or horse power substitute more for labor on some farms than others. With this interchange of the factors of production there is increased need for a common denominator for all cost. Hence it appears that the money costs have a place. Finally, costs expressed in monetary terms proved a good means of interesting the farmer in considering his costs, and means for their reduction.

Mr. Pond made an excellent point in saying that originally cost accounts served as a means of securing teaching material, and I can vouch for the fact that they fortify an extension worker with at least some information about all phases of the farm business. As a research program develops and less complete types of research are undertaken, cost accounts afford excellent help in interpreting less complete records. A good point was made by Mr. Thomas when he said that the larger the farm the greater the need for detailed study and he might well have added that the greater the number of enterprises to choose from, the greater the need for detailed study.

ENTERPRISE COST STUDIES

Mention was made of enterprise cost studies. I believe there is reason for making a little mention of them. The cost involved in making detailed costings of the entire business prohibits the study of a large number of farms. The number which can be studied within the resources of most experiment station budgets does not make it possible to study all the various practices followed in conducting the outstanding enterprises of the region by detailed cost of production methods. For example, a cost route of fifteen to twenty farms in an area will not include a sufficiently large number of producers of one product to enable the investigator to study the various practices followed in its production throughout the area. However, one man supervising a farm enterprise cost study may be able to obtain a large number of records which will enable him, not only to have all the various practices represented in his data but also to have a number of instances of each of a number of different practices which may be in use. It may well be recognized that in diversified farming areas the primary purpose of enterprise cost studies, especially where the enterprise is not a directly competing one, is to provide a means of studying its internal organization and the factors making for its success, rather than actual profits. The place of many enterprises depends primarily upon their complementary and supplementary relationships, that is, their influence upon the profit of the entire farm undertaking, rather than upon the direct profit realized from the enterprise.

FARM BUSINESS SURVEYS AND FINANCIAL ACCOUNTS

The survey serves as the only practical basis for obtaining a cross-section picture of the agriculture of a region, and when used for that purpose the worker should endeavor to secure all the farms in the area.

Little mention has been made of financial accounts, but with your indulgence, I wish to come to them a little later. At present it seems that detailed costs of the entire farm business, enterprise cost accounts (frequently kept by farmers), survey records, and financial records, all play a part in a well rounded research program in farm management. As an illustration of this point of view may I refer you to Illinois Bulletin 329 in which data from all the different types of research were used.

REACHING FARMERS

I shall ask you to pardon me now if I revert to a little history which has played a part in shaping our research program. The fact that for several years I was engaged in the task—through our extension service—of helping farmers to study and analyze their business, made clear to me the gap which existed between the formal bulletin, and the actual changing of farm practice. I think it is betraying no secret to say that our research people are somewhat disturbed at times because more farmers do not read our bulletins.

Starting upon an extension program in 1915, we had two years of detailed cost account results to use which provided useful information on practically every phase of the farm business, but they did not bridge the gap between research and practice. At that time the preparation for extension work included training in taking survey records. The method was readily accepted, and I believe I was properly enthused about taking survey records for I took 250 the first winter with no assistance and I think they were well taken. These records were returned individually to farmers the next summer. Those who did well were glad to know it; those who had been less successful frequently excused themselves by saying, "Well, I expect I left out some item," or, "It was just an estimate any way." Then came the desire to place the farmer on record, but I was told farmers would not keep records. A farm financial record and a production record book was prepared, however, and placed before farmers in the winter of 1915. Fortunately, several methods were tried in placing the records with farmers during the first year. In one county the county agent, comparable to your county organizer, asked that I speak to groups of farmers and explain the keeping of accounts. At two meetings farmers purchased 400 books at 15 cents a copy. The keeping of the record was carefully explained and we promised to meet them a year later to close the accounts. An optimist might have concluded that the only reason farmers were not keeping more records was because no one had provided a satisfactory form of an account book. You may be surprised to learn that when we arranged to close the books a year later, a total of four farmers brought in completed records to be closed.

Fortunately another method was used in the adjoining county

where the people and farming conditions were similar. There it was arranged with the county agricultural agent to send a letter to some of his farmers inquiring if they wished to keep farm records. Sixty replied that they did and in one week we visited each man on his own farm and assisted him in entering the inventory of his farm business in the Illinois farm account book. Each man was visited once by myself and once or more by the county agent during the year. At the end of the year arrangements were made to meet the farmers at the nearby towns to close their accounts. We were agreeably surprised to close 48 accounts, or 80 per cent of the accounts opened. From the experience there we worked out, and have perfected from time to time, the plan of the project. This is the plan followed in completing about 1,500 financial records for the year 1928.

Summaries of the work are prepared for each county, or for adjoining counties, completing thirty or more records. The report based on fifty-four farms in Dupage and adjoining counties, placed in your hands, is typical of thirty-two such reports prepared for different areas of the state for last year. Last year 1,500 financial records were kept in the state and summarized in our office. That the farmers are interested in their work is shown by the fact that they continue to cooperate in the project¹. There were nineteen of the original forty-eight men who kept records each year for the first seven years, even though this period covered the years of the World War when some of the men were away from their farms or had plans interrupted. The work grew in that county without much encouragement until 100 to 125 men were completing records in 1922.

It was then that it was seen that the work was expanding in such a way that we would need to find other means of handling and financing it. Consultation with farmers who had been in the work several years disclosed that they wanted more help rather than less help and that they were willing to pay for it. It led to the formation of a cooperative organization of over 200 farmers who were paying up to \$20 a year for the service they were receiving. Details of the organization of this project are given in the *Journal of Farm Economics* for the year 1926 from the proceedings of the annual meeting. In 1928 the project was re-organized

¹ Details of the plan of work are given in Extension Project 1 of the Department of Farm Organization and Management, University of Illinois.

with 419 members for a three-year period with the farmers paying in over \$7,000 a year for the service. This was in the same area where the work began a year earlier with over 200 cooperators. Two field men are employed and the expansion of the project in other areas seems probable.

The service aspect of the project is stressed but the data are equally valuable for research work. One of the features which has been most useful in depicting results to farmers has been the efficiency or thermometer chart showing for each cooperator his standing with reference to the average farmer.

The first year's financial records on a particular farm may be no more accurate than a survey record, but the farmers actually record most transactions as they occur. This is especially noticeable as regards items of expense. The financial records, however, have a distinct advantage in that an actual inventory is taken at the beginning of the year; the farmers become more interested in the record when they participate in keeping it than they do in a survey, and there is the same opportunity of checking the record for accuracy at the end of the year.

In closing, it may be said that the financial records provide a business service to farmers and when they wish to make improvements in farm practice it directs their attention to improving the farm at the point where the greatest weaknesses are located.

DISCUSSION OF PROFESSOR CASE'S PAPER

Sir Thomas Middleton—I think we will disagree with Mr. Case on one point only, namely, his statement that he has taken too much time. This is a specially interesting paper because it stresses the importance of surveys from a new angle—the educational value of record keeping to the farmers. Mr. Case could not have done this better than by giving an historical sketch telling us how he approached the subject, the difficulties met with, and how these were surmounted. Four hundred account books, and only four returns! This did not discourage Mr. Case. There are similar difficulties in getting farmers to keep records here in Britain. All who have experience of practical farming must know the value of accounts. Next to financial accounts in importance, I attach most value to a daily record of labour.

Dr. Taylor—The papers of Mr. Pond and Mr. Case presented different phases of the subjects and type of work going on at the two institutions. There is a close relationship between the work at Minnesota and Illinois. Mr. Case had the educational point of view since he was an extension man. For two years he was in the United States Department of Agriculture.

While there he had a chance to see what people were doing and to think through the question of how to attack problems from the educational point of view. I wish the work were getting across in every state as it is in Illinois.

Sir Thomas Middleton—I have been looking into a paper by Dr. Baker on the increase in production in American agriculture since the war. He shows an increase of 13 per cent as between two five year periods, and he analyzes the reasons for this increase. While I follow his figure and appreciate his points, there is one point which he does not make. It seems to me that this increase must have been due to a great extent to improvements, not only in machinery and livestock, but in the men engaged in the industry; that in fact, the great educational efforts made by the United States in recent years are largely responsible for the rapid increase in production achieved. Dr. Baker has pointed out for example, that the yield per cow has increased substantially, and that meat production has gone up because of a shift over from beef and mutton, to pork; but it was not the cow or the pig that made these changes, but enlightened stock-owners, and the enlightenment came from the experiment stations and colleges of the United States.

Dr. Baker—Doubtless some farmers would like to stop extension work, but there is no way to stop its progress now. Mr. Case's work at Illinois illustrates some of the valuable work in the United States. The advance in education and improved machinery are largely responsible for the increase in agricultural production. The increase in milk production in the last ten years has been probably 1,000 pounds per cow or an increase of 25 per cent. The tractor has been another great factor, especially in the expansion of the arable area in the West. Increase in agricultural production during the 7 or 8 years after the war was greater than at any time since 1890.

Professor Ashby—I should like to ask Dr. Baker a question. Was the change over to a more productive animal closely connected with a change in the dietary habits of the population, that is to an increase in the consumption of dairy produce? In other words, does it start with the consumer or the farmer?

Sir Thomas Middleton—Mr. Chairman, I agree with Mr. Ashby that war was partly responsible for changes in American production. Early in 1916 we in this country were advising our farmers to keep pigs, for we could not then afford to buy American bacon; then America declared war, and our financial difficulty being solved, we urged farmers not to keep pigs, and we bought extensively in America; thus pig production there was stimulated. Again in 1917 Americans were reducing wheat consumption in order that more wheat could be spared for the Allies; after the war the consumption of wheat remained at a lower level, corn replaced wheat, and with corn was associated milk and pork production.

Professor Pond—An important factor in the success of our farm management research projects in Minnesota is our cooperation with the Bureau of Agricultural Economics, with other divisions in our experiment station, and with the agricultural agents and farm bureaus of the counties in

which we work. The Bureau of Agricultural Economics not only joins in supplying funds and personnel but furnishes much help in the way of advice and suggestions and serves as a clearing house for ideas between workers in different states. Our cooperation within our own institution gives us the assistance and support of subject matter specialists and also makes our own material more vital and usable to them. It also enables us to combine our research findings with the result of experimental work to better advantage. We never start a research project in a county without the active assistance and support of the agricultural agent. This not only facilitates making the necessary farm contacts but prepares the way for the extension service to use our findings locally.

Sir Thomas Middleton—Is there any charge for the service? Answer: No.

Dr. King—In Scotland we make use of our county organizers to get into touch with the men into whose hands we can put account books. We have not had more than 5 per cent refusals.

Professor Ashby—It is sometimes suggested that in Wales we do not know much of farm management. At Aberystwyth it was quite definitely decided 4 or 5 years ago not to do cost accounting. In the autumn of 1924, we arranged with a group of farmers to keep cost records of the milk enterprise. These milk records for 30 farms were carried through a period of three years, each farmer being given a statement of his result and the average for his group, together with the average for the county, and the average for the "cost" group into which his farm fell. Very marked results were obtained for 25 farms out of the 30 farms. The people concerned did not attempt to answer questions about feeding, and so forth—they simply handed over feed sheets to the advisory chemist. The next step was to start an investigation of labor. Detailed accounts were obtained from farmers of horse labor, of manual labor, and of wages three or four times a year, together with details of farm stock and complete inventories. This work was carried through approximately 3 years or two complete crop cycles. Two colleagues have asked if the system cannot be extended to 200 farms. It is the most useful work we have ever done or are likely to do.

My colleagues are working on financial accounts, and by the end of the year we shall have a group of financial accounts which we can safely begin to analyze. Either of these studies can safely be extended—we know pretty well their advantages and their weaknesses. Given the necessary money, we would prefer keeping 100 labor accounts (quantity accounts) to 30 or 40 cost accounts. We would never attempt the study of farm management as such without carrying on studies in the general economics of agriculture, especially the study of prices.

The problem of prices in relation to costs is well illustrated in the case of beef and pig meat. Changes in the production of beef have led to small spring supplies and high prices, and to heavy autumn sales and a slump in prices. If the question is asked, "Does grass fed beef pay?", the answer, probably is, "Yes, if it can be sold before September 1—after that, no." As regards pig production, costs and prices have to be taken

in relation to the "cycle." Of that, all I can say at the moment is that I wish our problem was as simple as that of our American friends' "pig cycle" seems to be.

Finally, I would like to ask Mr. Case if the aim is merely to help farmers improve results on individual farms? If 2,000 farms are benefited, may not 2,000 other farms suffer? Is it not true that this increase in efficiency is passed on to the consumer? If efficiency increases in a greater ratio than population, will not farmers suffer economically in the end?

Professor Jutila—Single entry bookkeeping was started in Finland in 1912. In the beginning it was difficult to get farmers started to keeping books, but later they asked for the service. At present, about 700 farms are sending material to the Bureau of Agricultural Economics, which prepares and analyses the bookkeeping material. This material is valuable to farmers. We are publishing results every year. It is to be noted that farming in Finland also includes forestry. In Finland there are 22 agricultural societies, the advisers of which help the farmers to keep their books. Every farmer gets records of his own farm as well as the averages for his neighbourhood, and a record of the best farms. Farmers now say they cannot be without records. It may be mentioned that 13 farmers have kept books for 17 years. It is very difficult to get small holders to keep books. The survey method is especially valuable as a means of securing information relative to operations and returns on small farms.