MICHIGAN FARMERS' USE OF TELFARM, A NEW COMMUNICATION FEEDBACK SYSTEM

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ABSTRACT

MICHIGAN FARMERS' USE OF TELFARM,
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by M. Anita McMillan

A communication framework was utilized to examine farmers' use of an electronic farm accounting system known as Telfarm. Farmers' attitudes toward a feedback channel of communication were examined with particular emphasis on the degree of perplexity associated with the messages carried by the channel, and the degree to which the farmers perceived any alternatives to the channel. The extent to which farmers possessed a national value orientation was explored relative to their use of the accounting and record-keeping system.

The data were collected using a mail questionnaire from 226 Michigan farmers who were enrolled in the Telfarm Program during the 1965 fiscal year. Indexes to measure each of the six independent and dependent variables were constructed. Seventy-two percent of the samples returned completed questionnaires. The sample was selected to ensure a suitable geographic distribution of the 1,200 farmers who were currently members of the Telfarm Program.

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One of the major purposes of the dissertation was to determine whether a high degree of economic rationality was associated with increased unaided use of the Telfarm Program. Agricultural economists refer to the need for accurate records in order to maximize farm income by selecting enterprises and practices appropriate to the particular farm situation. The Telfarm system constitutes a relatively sophisticated channel of communication carrying message relevant to farm management decision-making. Three scales were used to indicate a rational value orientation. Economic motivation scores were found to be significantly related to the amount of unaided use made of Telfarm. The relationships between unaided use and the other two scales, independence and scientific orientation were not significantly different from zero. It was concluded that farmers with a higher degree of economically rational value orientation do not utilize Telfarm more than those with a lower degree of economic rationality.

Farmers who had difficulty understanding the Telfarm program, feeling that it was too complex for their level of knowledge or amount of prior training, were found to use it less than farmers who had fewer problems. Telfarm cooperators who felt that there was no suitable alternative

to the Program tended to have higher unaided use scores than those farmers who perceived an alternative.

Members of the Program who felt that the channel of communication was valuable for farm management purposes and who had low perplexity scores were found to use the instrument more than those who had higher perplexity scores and found it less valuable. Farmers with no perceived alternative to Telfarm and low perplexity levels were found to utilize Telfarm more than those perceiving an alternative and having high perplexity levels.

A method of multivariate analysis known as canonical analysis was utilized to examine the relationships existing between two sets of variables relevant to the Telfarm Program. One set consisted of the scales representing a national value orientation. The second set consisted of the variables related to use of and attitudes toward the Telfarm Program. The canonical analysis revealed that the two sets of variables were related in at least one significant manner. The examination of the two sets of variables as groups did not result in any substantial improvement over the zero-order correlations between the variables within the sets.

Suggestions for future research were made focusing on the unique characteristics of the feedback channel known here as Telfarm. The respondents have a high degree of voluntary exposure to the cahnnel and the messages carried by the channel. The messages could be varied both by content and format and still remain relevant to the farmer for his future decision-making.

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CHAPTER I

INTRODUCTION

The present study examines Telfarm, an electronic farm accounting system from a communication viewpoint. Telfarm serves as a feedback channel, carrying information relevant to the farmer for farm management decision-making. The study focuses on the use of the channel, attitudes of the farmers using it, especially the degree to which they possess a rational value orientation, and farmers' perceptions of the channel.

Telfarm As A Communication System

The area of farm management has always emphasized the role of record-keeping. A recent book by Castle and Becker (1962) devoted a section to the tools of the decision-making process, which highlights the importance and specific uses of farm records as a prime analytical tool. They stated that records were essential to supply the information necessary for decision-making. Hopkins and Heady (1961, p. 3) stated that...

> High returns and efficient management have come to depend more and more on the use of records. The successful farmers in any community not only keep records but look upon them as a means of increasing their operating efficiency.

In 1964 Michigan State University started a new and expanded version of farm record-keeping with the aid of a grant from the Kellogg Foundation. The program was called "Telfarm" (Today's Electronic Farm Records for Management), and was planned to utilize the facilities of the electronic data processing equipment at the University. While other universities were starting to utilize computer facilities for farm records, Michigan State University was the first to provide the service to large numbers of farmers on a fee basis. In its first year of operation, over a thousand farmers participated in Telfarm at an average fee of $108 per annum.

The farmers who cooperated in this program received account books and sheets on which to record their transactions. These were mailed to the University at monthly intervals. At quarterly intervals the cooperators received quarterly income and expense reports, and at the end of the year a complete buisness breakdown in the form of several types of summary reports. All Telfarm cooperators received three types of summary reports: income, expense and investment; depreciation schedules; and farm business analysis reports. They could also elect to receive any or all of five additional types: hired labor, enterprise, farm credit, net worth, and family living.

Telfarm is directed by professional staff of the Michigan State University Department of Agricultural Economics. Six field men are assigned multiple county areas so that they service all

of the Telfarm cooperators located in the Lower Peninsula of Michigan. They usually pay several visits each year to every cooperator to aid him with specific record-keeping problems as well as to give guidance on general farm management. Michigan Cooperative Extension Service personnel located in the individual counties also aid cooperators with the Telfarm program.

A farm record-keeping system can be view as a channel which carries messages about the internal structure of the farm business. In this case the code or systematic set of symbols carried by the channel deals with the inputs and outputs of the farm business. In Berlo's (1960) communication model, the elements are source, message, channel, and receiver. In the case of Telfarm, the source and the receiver are the same person, namely the farmer. Telfarm records his farm expenses, receipts, physical data, etc., in the format of an accounting code. The messages are processed by a computer, the data is summarized and tabulated, and then returned to the farmer by mail.

The generation of small, discrete units of information such as the individual items in a list of receipts or expenses, followed by their return from the computer in an organized and summarized format, is one type of feedback. It gives the farmer (or source) information concerning his success in accomplishing objectives. This particular feedback channel shares a characteristic with interpersonal feedback, both can

serve as a check on the source's effectiveness. Telfarm also shares some feedback characteristics with the communication receiver whose messages are transmitted from the mass media. There is separation in time and space between the source and receiver.

The farmer can be conceptualized as a goal-oriented person who engages in certain managerial processes which lead to an outcome (farm business success or failure). One of the processes in which he engages is information-seeking. Thus, he may seek contact with various channels of communication on various issues. The extent of the farmer's exposure to both interpersonal and mass media communication channels has been investigated in numberous past researches. The farmers' contacts with these channels bring him external information, or messages about the world outside his farm. These may be farm-related, such as the noon livestock price reports on radio or inofmration about a new seed variety in a farm magazine. They may also deal with international affairs or local community decisions.

External information is essential to the farmer for his business decision-making, but so also is "internal" information (that is, information informing him about the operation of his own enterprise). The records and accounting data relating to his enterprise are the primary source of this internal information.

A review of the literature revealed general agreement on the need for sources of internal information, but there appeared to be no published research on the role they fill in the farmers' total communication behavior.

A study was conducted on the use of accounting data by operating departments in manufacturing concerns by Simon and others (1954). They found that accounting information or internal information was used at various executive levels to answer three different kinds of questions: (a) Problem-solving questions: Which course of action is better? (b) Attention-directing questions: What problems shall I look into? and, (c) Score-card questions: How well am I doing?

March and Simon (1958, p. 161) pointed out that these questions all deal with the use of communication relating to substantive content as opposed to communication relating to procedural matters. They classified the three occasions for communication as follows: (1) communication to provide data for application of strategies, (2) communication to evoke programs, and (3) communication to provide information on the results of activities.

The three types of use made of the accounting information by firms could apply equally well to the farm manager. Organizations have to utilize many more sources of internal information relating to the firm, and have to consider the communication networks within the firm, whereas the accounting and record-

keeping system of a farm carries a much larger proportion of the total internal information.

The concept of channel as applied to Telfarm has some unusual characteristics. The source generates the message to be sent via the channel; and the type of message has a rather narrow definition in keeping with the channel used. Schramm (1956) stated that communication channels could be conceptualized as occupying three bands, sound, gesture and action, and object; this particular channel (Telfarm) utilizes the object band. This is a somewhat less complicated situation than where messages travel simultaneously in several channels and the total meaning for the receiver is affected by the relationships between the channels or bands.

The source has little control over the format of the messages carried by the channel. A particular message organization exists for both input and output, and a time lag exists if the source wishes to alter either of these. The existence of the computer as a secondary receiver and source will be largely ignored in the present investigation because the computer functions mainly as a processing device.

The accounting channel was designed by economists in order to supply relevant information, or information which they perceived as having utility for the individual farmer. The economist assumes that the economically rational man is managing his factors of production in such a way as to maximize his

profits. In order to do so he is assumed to be completely informed. Replacement of this normative model by a behavioral one would imply that the more economically rational individual seeks more information on which to base his economic decisions.

Although the Telfarm channel was designed to carry messages relating to the internal condition of the farm, there are alternative ways for the farmer to obtain such information. Whether or not they are utilized will depend on the visibility of the information-source alternatives to the farmer, and his perception of the present channel (Telfarm).

Purpose

The present research was designed to examine the use of a particular channel of communication by farmers and to determine the relationships between their information-using behavior and (1) rational value orientation, and (2) perception of the communication channel.

The objectives were:

1. To examine the relationship between the amount of channel use and an economically rational value orientation.
2. To examine the relationships between the amount of channel use, attitudes towards the channel, and perception of channel alternatives.

CHAPTER II

REVIEW OF LITERATURE

Farmers' Use of External Communication Channels

Farmers use many channels of information; these channels carry messages which may range from being completely irrelevant to his role as farm manager, to being completely relevant. The latter is the case with a system of farm records. The role of farm manager involves making decisions with reference to the allocation of available and finite resources among alternative profit-producing activities. In order to make these decisions, the farmer requires information about his resources. For each farm, given this set of finite resources, there exists an optimum combination. This is rarely attained, and the lack of knowledge or information dealing with the resources may be one reason for its lack of attainment. To this extent, the basically economic nature of farm management is in part a communication problem.

The profitability of farms is influenced by technical as well as economic factors. The technical factors include the farmer's level of knowledge and application of recommended farming techniques. Most of the communications research dealing with farmers which is relevant to decision-making deals with the transmission of information from outside experts to the farmer. The area of adoption and diffusion of agricultural

innovations centers on the communication process from this viewpoint. It is cogently summarized by Emery and Oeser (1958, p. 3) in the question which underlay their study of graziers in Australia, "What are the conditions which determine effective communication between scientists and the farmer; and what are the conditions which determine whether or not a new practice is adopted?"

Several disciplines have looked at aspects of the information-seeking and information-using behavior of farmers. Farmers' use of the mass media, particularly with respect to the amount of time devoted to media consumption, has been examined extensively. This area is obviously relevant to advertisers seeking farmers as a specific audience. Farmers' use of information from both the mass media and publications from institutional sources, such as university extension service publications or governmental agencies, has also received some attention.

Rural sociologists (and others) have studied the relative importance of various information channels at different stages in the adoption of new farm practices. In these studies, the focus has been on dimensions such as personal versus impersonal communications, and cosmopolite versus localite information channels, and how these dimensions are of differential

importance at various stages in the innovation-decision process.

Agricultural economists acknowledge the importance of communication behavior, particularly with respect to farm management, but they have done little research in this area. A recent article by Nielson (1961) conceptualized the managerial process as a flow consisting of eight inter-related segments:

> (1) Formulation of the goals or objectives of the firm or unit; (2) recognition and definition of a problem, or recognition of an opportunity; (3) obtaining information -- observation of relevant facts; (4) specification of an analysis of alternatives; (5) decision-making -- choosing an alternative, which is the core of the management process; (6) taking action -- implementation of the alternative selected; (7) bearing responsibility for the decision or action taken; and (8) evaluating the outcome.

Most of the research conducted on managerial behavior at the level of the individual farmer deals with area 1 and 8. Lee and Chastain (1960, pp. 650-659) recently conducted a study dealing with the role of problem recognition, area 2. They found that half of the farmers failed to recognize greater income opportunities, and were unable to recognize basic problems as revealed in their business summaries. Their study did not examine the farmers' communication behavior in any detail, although the authors stated

that "farmers who fail to make plans or who do not keep accurate records for use in decision-making may overlook opportunities for increasing income."

External communication channels can also be used to supplement the information carried by internal channels. Farmers can request or receive help in evaluating the records from other persons, such as the county agricultural agent, local banker or Production Credit Administration representative. However, there appears to be no published research on the aided use of farm records. The agricultural economists have dealt in a rather general manner with some aspects of farmers' use of the external channels of communication, but not with reference to the use of records or accounts.

Farmers' Use of Internal Communication Channels

In order to study the information-seeking or -using behavior of farmers, particularly with reference to farm management, the source of the information can be divided on an internal versus external source dimension. In the same way that the urban businessman requires information about his firm for decision-making, the farmer also requires information about his farm. The difference between the urban and farm businessman is that the urban businessman usually has accountants to

gather much of the information, other employees available to gather other kinds such as labor records, and still others to perform analyses of the accounts and records; the farm businessman usually must do his own gathering and analyzing. The characteristics of his use and attitudes towards internal communications reflect an individual rather than a group orientation, as weould be the case in an industrial firm.

The major source of information about the internal characteristics of the farm are farm accounts or records. There are others, such as field records with details of cropping practices followed, soil tests made, fertilizer programs, production records, and individual cow health records or milk records (D.H.I.A.). All farmers are required to keep a record of their financial dealings for tax purposes. The records may range in sophistication from one shoe box for receipts and another for records of expenditures, to an automated and sophisticated system such as Telfarm.

Whether the system used to keep farm records and accounts is simple or sophisticated, its principal objective is to facilitate the management of the farm. This type of feedback can contribute to management by (1) providing a history of performance of the farm, (2) aiding in the control of current operations, and (3) providing the basic information required for forward planning or budgeting of future farm operations.

These records also provide the financial data necessary for income tax purposes, and can be used for settlements between landlord and tenant, or in family partnerships. Farm accounts can also facilitate credit transactions or help young farmers in working out rental arrangements. As well as benefiting the individual farmer, these records have been used extensively by educational institutions, and individuals engaged in agricultural education, whether extension services or professional farm management associations. Records have been used by government programs for such purposes as establishing allotments or controls, and also to aid in general agricultural policy decision-making.

Although farm records and accounts are a well-established part of the history of farm management in the United States, there is a paucity of research on how they are actually used by farmers, and what kinds of attitudes farmers have towards record-keeping projects. Kyle (1953) studied the improvement of farm accounting procedures with two major aims: first, to determine the number and type of farm account records required to establish significant differences in farm income among farms for various factors; second, to develop new, and test existing, methods of farm business analysis. Most of the other studies on farm records have dealt with the effects of different types of records on the analysis of the farm business,

or on the use of various mathematical manipulations for such purposes as linear programming, enterprise, analysis accounting, or scheduling problems.

The introduction of high speed data processing equipment, and its potential for expanding and refining the use of both accounting and mathematical techniques, is a relatively new area for farm management. I.B.M. held its first Agricultural Symposium in 1962 to discuss this area. Howell (1962, p 128) said at that meeting:

> Farm records are a means and not an end. Unless they are designed to meet the requirements of the farm manager to improve his decision-making ability and provide the essential data for programming they easily become an end in themselves.

One of the few comprehensive studies on the use of different information sources by farmers for farm management processes was the Interstate Managerial Study (IMS) conducted in the Midwest with a random sample of about 1,000 farmers by Johnson and others (1961). The IMS highlighted the importance attached to production and price information by farmers, but did not emphasize the role of farm accounts and records in providing this information.

The IMS was designed, in part, to measure the types and sources of information used by farmers to solve problems of farm organization and operation. The types of information were

divided into five categories: prices of factors bought and sold, production factors, new developments, human factors and institutional information. Farmers were asked where they would go for information in three situations: organizing a farm, operating a farm for maximum profit, and operating a farm to maximize family satisfactions. In terms of the relative importance of the five categories of information in the light of the farmer's own experience and for his own farm operations, production information was found to be most important and price information next most important.

Farmers participating in the IMS were asked what source they used to secure six different types of information. On the average, six "noncommunicative" (i.e., internal) sources of information were used more frequently than 18 "communicative" sources. The six noncommunicative sources studied were past experience, trial and error on the whole operation, experimentation on a limited scale, observation of the experience of others, reasoning from information known to be true, and keeping written records. This breakdown probably underestimated the use of written records since they can also be used in four of the other five categories, omitting only the observation of the experience of others.

The IMS research project studied the use made by farmers of all noncommunicative or internal sources of information.

Written records constituted nine percent of the total non-communicative sources. Past experience was most frequently mentioned; almost 40 percent of the total responses mentioned this source. Written records were mentioned primarily as sources for price information, but also for production information (Johnson, 1958).

One study which focused on the use of farm records for decision-making was conducted by Houghboom (1963) on the extent to which farmers used Dairy Herd Improvement Association records. He found that participants in the D.H.I.A. program had greater awareness of participation costs than of monetary returns. The records received extremely little use for either culling cows, which were poor producers, or for varying feed practices. The desire for recognition, status or prestige appeared to be the major reason for participation in the D.H.I.A. program.

The studies which have been concerned with the use which farmers make of internal sources of information have either been quite general in scope, or dealt with specific types of records other than farm accounts. None of the prior research projects studied the intensity or amount of use which farmers make of their records, or examined the farmers' attitudes toward records and accounts. The earlier studies also did not focus on farmers' viewpoints on related

agricultural topics, such as their degree of economic motivation, or emphasis on a traditional versus scientific approach to agriculture.

Communication Behavior and Decision-Making

Frequently decisions are concerned with the acquisition of information which is relevant to some particular decision. Information-gathering involves some cost, and the value and relevance of the information to the terminal decision is rarely known in advance. Some psychologists interested in information-seeking behavior have conducted laboratory experiments which usually involve gambling situations with various levels of cost of information and pay-offs. Irwin and Smith (1957) concluded that their subjects did an adequate job of intuitively sizing-up strategies in complicated information-seeking tasks. Subjects generally attempted to maximize expected value. One recent experiment conducted by Edwards and Slovac (1965) reported that individuals exhibited quite stable differences in information-seeking tasks, so that individual subjects were quite consistent in being cautious or incautious.

Another recent study by Naylor (1964) focused on the characteristics of various information-sources in explaining

the source of preferences of decision-makers. Accuracy appeared to be the most rapidly recognized and strongest characteristic influencing the preference for a particular source. Source variability and the objective expected value also influenced the source preferences of decision-makers.

The research which has been conducted by psychologists in the role of communications in decision-making has been mainly conducted in laboratory experiments, where many of the relevant variables can be rigidly controlled. It is problematical whether the findings can be directly applied to the farm management decision-making area, since many social and psychological variables are relevant and it is rarely possible to exert a high degree of control over the experimental situation.

Agricultural economists are concerned with problems of researching management, and particularly with those variables which might be used to predict managerial success; however, they have been less concerned with the mangerial process as human behavior. Neilson's model of the farm manager (1962) pictured him as a behavioral entity or goal-oriented system seeking to produce a desirable goal-state or outcome. Given certain configurations of background experiences, drives and motivations, and capabilities or talents, the manager engages

in certain processes, which lead him into activities that produce outcomes of varying degrees of success or failure.

Measuring or describing the mangerial processes of the farm manger is not easy. The interstate Managerial Survey of Johnson and others (1961) attempted to do so and studied the analytical processes in farm management, the making of decisions and the managerial behavior of farmers in formulating expectations of future events. A larger number of studies have selected variables descriptive of the background experiences, drives and motivations, and capabilities or talents of the farmer, and related these to managerial performance. Usually, economic criteria have been selected as measures of managerial performance. One or more of the economic outcome criteria are usually related to selected characteristics of the farm manager in order to characterize various levels of performance.

One study which investigated the human aspects of farm management was conducted by Daw (1964) with farmers in the sand land area of Nottinghamshire, England. He investigated the effects of social characteristics, mental ability and the use of information sources on farmers' economic performance as indexed by net farm income per acre. Daw found that farmers' net incomes appear to be closely associated

with their age: the older the farmer the lower his net farm income tended to be. He also found that mental ability was related to income. However, the measurement technique used was somewhat subjective and involved an assessment of the farmers' mental ability by the author of the research.

Another study conducted in North Carolina by Martin and others (1960) studied the effects of levels of management and capital on the incomes of small farmers in the South. Personal ability of the farmer in the study was evaluated by an appraisal of the farmer's ability to observe, analyze, and make decisions concerning production methods and responses. The authors concluded that better managers used more productive inputs and had higher incomes.

Information-seeking and information-using behavior are an important part of the process of management. Since the data pertain to the individual's farm, it clearly is relevant to farm management behavior. Past research has rather neglected the relationship of various parts of the process of management to the antecedent conditions and the outcomes. It is possible to look at characteristics of the farm manager and determine how these selected variables influence his information-seeking and information-using behavior. Likewise, it is possible to study the manager's communication behavior as one variable indexing managerial

behavior, and to relate it to the outcome of the process or to the extent to which he achieves managerial success or failure.

Information-Seeking and Information-Using

The terms "information-seeking" and "information-using" have been used by several authors of research studies dealing with communication. The initiation of contact by a person with one or more communication channels about an issue or area of interest will be defined as information-seeking. At the operational level, a count of the number of sources or media used for information about a topic would be one index of information-seeking. For example, a farmer might utilize radio programs for price information, not utilize television for that purpose, utilize newspapers, and no utilize magazines.

Information-using will be defined as the intensity with which a receiver searches a channel or channels for communications about a topic or issue. At the operational level, measures of the intensity amount or importance of a particular channel would be indices of information-using. For example, a farmer could listen to price information on the radio for ten minutes, five days a week. This would be termed an index of information-using. These terms have been used indescriminately

in the communication literature and were rarely defined. The philosophy suggesting clearer definitions of the terms was expressed by Lionberger (1955, p. 32):

> Use or non-use of a source of information is one expression of the evaluation placed upon it. However, since use is also a function of source accessibility and operator habit, simple use-frequency data may not clearly reflect the relative importance placed upon it by the user. Verbal expressions of importance provide a more direct approach.

One of the earliest communication studies which measured both information-seeking and information-using behavior was conducted by Katz and Lazarsfelt (1955) in Decatur, Illinois. The design for their study began with a cross-section of women and proceeded to identify the persons who were influential for the sample members in their daily activities. Four areas were investigated: marketing, fashion, movie-attendance, and opinions on local public affairs. They used the term "exposed" for women who gave an affirmative answer to such questions as: "Did you hear about it on the radio?" or "Did you read about it in a magazine?" This could also be termed information-seeking behavior. The Decatur study also measured frequency of contact between respondents who communicated with each other on each of the four areas. This could be termed an index of information-using behavior.

Individuals who exerted influence over others were called "opinion leaders" and numerous communication studies followed the Katz and Lazarsfeld one investigating opinion leadership in different areas of activity. Thus, Beat and Rogers (1957) found that personal influence was more important then any other type of information source in persuading Iowa home-makers to buy Dacron, Orlon and nylon fabrics.

Later communication studies focussed on how the opinion leaders differed from their followers. Rogers (1962) reviewed several studies investigating the differences in information-seeking and -using behavior of opinion leaders and followers. He concluded "opinion leaders use more impersonal, technically accurate, and cosmopolite sources of information than do their followers."

With the growing awareness that people differ in their use of both interpersonal and mediated communications, more recent studies have investigated psychological and sociological factors influencing information-seeking. Several social and psychological variables were included in Diaz (1964) study of information-seeking behavior of farmers in Brazil. Marsh (1966) investigated the relationship of such predisposing factors as opinion leadership, sense of powerlessness, issue interest, and gregariousness on information-seeking behavior among Nebraskans.

Rational Value Orientation

Farm record-keeping projects have been developed to aid farmers in improving their decision-making. They provide the data necessary for parts of the management process. To the extent that the farmer possesses an economically rational value orientation, he could be expected to utilize relevant information sources in management decision-making.

A major study on the relation of farm operator values and attitudes to their economic performance was conducted by rural sociologists. Hobbs and others (1964) developed measures of the values of farm managers pertaining to the selection of economically rational means, and related these measures to the economic productivity of the farm firm. The measures developed in the study were utilized to develop a predictive model of differential farm management productivity which included predispositional, situational, and perceptual and cognitive factors.

Hobbs (1964, p. 35-6) reviewed the various conceptions of rationality and concluded that the following points should be included in a definition:

> 1. Human behavior is never completely rational or nonrational but exhibits varying degrees of rationality.
>
> 2. The individual is limited in his ability to cope with the environment and therefore must construct a simplified model with a limited range of alternatives within which his actions display varying degrees of rationality.
>
> 3. The way in which this simplified model is constructed and the individual's action in relation to the model is influenced by his situation, values and beliefs, and his abilities to analyze alternatives and carry out decisions.
>
> 4. Behavior to be considered rational must be oriented toward the attainment of empirical goals. As a special case economically rational behavior is that oriented toward the maximization of profits, utility, economic return, etc.
>
> 5. Rational behavior involves the actor's choice of the most efficacious means for attaining a particular empirical goal. Behavior will be considered to be relatively more rational (given empirical ends of action) if it utilizes a scientific criteria of evaluation of means in the process of selecting the most efficient means for the attainment of the actor's goals.
>
> 6. Non-rational behavior includes that oriented toward the attainment of absolute values and/or influenced by affectual, emotional or traditional criteria in the selection of means.

An economically rational value orientation was measured in Hobb's study by five separate scales. Significant zero order relationships were found between the economic motivation scale, the scientific orientation scale and the independence scale and the criterion of economic productivity. The study was conducted with farm account cooperators, and the measure of economic productivity used was return to management averaged over a three year period.

The economist has focused on a particular aspect of rationality, that of economic rationality. It is often interpreted as being the degree to which behavior is directed towards the maximization of profits. A more general working definition used by Dean and others (1958) stated that "Rationality involves the use of deliberation, planning, and the best available sources of information and advice in arriving at decisions as a means of achieving maximum economic ends."

The research project conducted by Dean investigated the relationship between certain socio-cultural variables and rationality in decision-making. Farmers were asked open-ended questions, such as "How do you decide how much corn to plant?" The replies were coded by judges as being rational, intermediate, or nonrational. The judges were asked to make their evaluation on the basis of the definition of rationality

given above. This method of measuring rationality has the disadvantage that the measure is based on the judges' criteria of rationality, not the farmer's.

The treatment of rationality by social scientists has suffered from over-emphasis on complete rationality and complete irrationality. At one end, the economist has postulated that man has a complete and all-knowing system of preferences which allowed him to choose among alternatives. At the other end, psychologists often focused their attention on aspects of behavior which are decidedly non-rational. Freud focused on the emotional aspects of human behavior, and later psychological work frequently concentrated on the reduction of cognition to affect. Areas where human behavior is partially economically rational were ignored by both economists and psychologists.

The treatment of information-seeking and information-using behavior of man (for business decision-making) has also suffered from lack of investigations which consider the degree of rationality involved. The classical economic position assumes that all information is available and known, and that the rational man can perform all necessary calculations to select the best alternative. Social psychologists have often focused on the distortion of information-seeking and

information-using behavior by nonrational influences. Thus, Asch (1940) studied social pressures that persuaded individuals that spots existed or moved when they actually did not. Bruner and Postman (1949) found that coins appeared larger to poor children than they did to rich children.

Recent work in both economics and social psychology has moved away from these extremes and focused on more of a rapprochement between the two disciplines. Thus, Simon (1945) stated that the central concern of administrative theory is with the boundary between the rational and non-rational aspects of human social behavior. Social scientists studying business management, decision-making, and industrial psychology have recently viewed human behavior as being influenced by cognitive and perceptual limitations. The effects of different belief-systems, values and aspirations are now less often ignored in studies of economic behavior.

The normative assumption of perfect knowledge in the classical theory of the firm rarely approximates actual conditions in a firm. Nor does it allow for investigation of information behavior, since it is assumed to be on all or non situation. The assumption of perfect knowledge was relaxed by social scientists interested in behavioral studies of firms' behavior. Charnes and others (1959) postulated that

effort spent in search equals the expected return. From the normative model, the emphasis shifted to a more behavioral viewpoint. Cyert and March (1963) dealt with the organizational search for information on the basis of three assumptions: first, that search was motivated by a firm's problem-orientation; second, that it reflected simple concepts of causality; and third, that search was biased. Cyert and March then analyzed case studies of organizational communication and examined the ways in which information about the external environment was obtained and processed. They used this information to build a "positive" model of the decision-making process, written in computer language.

Both the assumption of absolute economic rationality, and the assumption of perfect knowledge are not particularly helpful in a study of the management process in behavioral context. To the extent that farmers possess higher degrees of economically rational values, they could be expected to need and utilize more information or knowledge on which to base their management decision-making.

Simon (1959) discussed the preoccupation of the economist with normative macroeconomics, or the guiding of decisions at the level of public policy. He attributed the macroeconomists' lack of concern with individual behavior to two considerations. First, the assumption that the economic actor

is rational allows the normative macroeconomist to make predictions about behavior without collecting observations. Second, the classical economic theory of markets with perfect competition implies that only the rational agent survives. Simon also pointed out that economists have been relatively uninterested in descriptive microeconomics or understanding the behavior of individual agents. This approach involves a description of the choice process that recognizes that alternatives must be sought rather than given, and greater emphasis on the consequences which are expected to follow the various alternatives.

The process of farm management falls in the area of descriptive microeconomics. It involves making decisions on the allocation of resources. While labor constitutes one of these resources, its importance has decreased, while the importance of the quality of management decision-making has increased, Changing production techniques, determination of production combinations, and deciding what factors to use in production are decisions requiring many discrete items of information. The conception of economic man defines a set of ideal characteristics postulated as essential to the optimum attainment of economic ends. The more closely the behavior of a farm manager coincides with the ideal type, the more successful he should be in terms of economic goal attainment.

The Hobbs' study suggested that it is feasible to develop empirical measures of a rational value orientation. Individuals appear to differ in the degree to which they possess a rational value orientation, and probably also on the degree to which they view different activities with an economically rational orientation. It is possible that the communication behavior of individuals, both with respect to information-seeking and information-using is influenced by their rational value orientation. This could be viewed in a general manner, that individuals differ in their overall value orientations, and also more specifically, that individuals can view different activities with varying degrees of economic rationality.

Message Perplexity And Information-Using Behavior

The farmer in the Telfarm program functions as a receiver of the accounting information in terms of the S-M-C-R model. As a receiver his ability to make use of the messages being carried in the accounting code will be influenced by his level of knowledge and also by the difficulty of the messages.

The level of ability of the receiver to deal with the message system will depend on such personal factors as education,

both formal and informal, and psychological characteristics such as his ability to deal with abstract concepts. These characteristics are usually measured by indices, for example, the number of years of school completed or by psychological tests measuring comprehension. However, perhaps even more important than these personal characteristics is the receivers' perception of his own level of ability to deal with the message.

Individuals are influenced in their communication behavior by three basic social-psychological processes. These were summarized by Rogers (1962, p. 225) as selective exposure, selective perception, and selective retention. These could be viewed as social-psychological filters, through which communications can pass. The researcher can only investigate behavior after the respondent has received or not received a communication. It is the respondent's subjective definition of the situation which is more relevant than the researcher's definition of the situation.

A message can be conceptualized as having elements and structure (Berlo, 1960, p. 54). The letters and digits of the accounting code are the elements, and the way in which they are arranged constitute the structure. These elements and structures are used to formulate a message code. The

accounting code has certain rules or procedures which make it meaningful to anyone who is familiar with its vocabulary. Message codes are of varying difficulty for a given receiver. The particular code usually determines the manner in which the difficulty level may be measured. Several different formulas are used to study the difficulty level of written English, probably the best known is the readability index developed by Flesch (1946). Readers of message codes are able to express their views on the level of ability which they perceive to be necessary to assess the content.

The relationship of perceived knowledge an conceptual skill of the receiver to source orientation was discussed briefly by Culbertson (1964). He made three assumptions: first, that people can define their ability to assess the content of a message and its implications; secondly, that people can define the general level of ability necessary to assess the content of a message; and thirdly, that people can define the distance between the two, or the extent to which their ability is less than the level required.

The difference measurement referred to by Culbertson will be defined in the present study as "message perplexity." This term infers that it involves both the complexity of the message and the relative ability of the receiver to assess it.

Message perplexity is defined as the distance between the level of ability necessary to assess the content of a message and the respondent's self-concept of his ability to assess the message. The complexity of new farm practices was found to be highly negatively related to their rate of adoption by Kivlin (1960). He defined complexity as the ease with which a practice can be described, demonstrated, and understood by farmers. Kivlin's definition would suggest that the ability of the adopter was considered. However, the complexity of a farm practice was actually rated by a panel of judges rather than by the adopter or potential adopter. Kivlin believed that the farmer's perceptions of practices would be biased by their own acceptance or rejection of the practices. In a study where the major focus is on the farmer and not the practice, it seems essential to include his perceptions of practice complexity, or in the case of Telfarm, its message perplexity.

CHAPTER III

RATIONALE AND HYPOTHESES

In this chapter the major hypotheses will be stated and the rationale supporting the hypotheses will be discussed.

General Hypothesis 1

The role of communications in management decision-making has been analyzed by some researchers in industrial psychology and sociology with the major emphasis on interaction between decision-makers. In agriculture as contrasted to industry, farm management decision-making is usually the task of the farmer himself. This does not imply that he ignores the influence of the relevant groups of which he is a part, the community, his friends or his family. This dependence on a single decision-maker means that the role of conflict between groups having different goals within the organization can be ignored. The farmer as decision-maker differs from industrial decision-makers in other respects also. He is expected to make decisions on a wide range of areas relating to agriculture. In industry, specialists can deal with specific areas and develop greater degrees of

competancy to deal with problems. Since communications, and more specifically information storage and information retreival, are essential parts of management in industry, personnel can be employed to process information. The farmer must depend largely on his own skills to gather and analyze information.

One important channel of communication utilized by the farmer is a system of farm records or accounts. The primary purpose of the present study is to investigate the utilization of the records as a particular channel of communication, and to determine the relationships between farmers' information-using behavior, and their rational value orientation, and their perception of the communication channel.

A recent paper by Hobbs and others (1964) on the prediction of farm economic productivity stated two postulates:

1. Economic rationality is a function of the beliefs, values and attitudes of the entrepreneur.

2. Economic rationality is a function of the perceptual and cognitive abilities of the entrepreneur.

The general hypothesis based on the first postulate was that the economic productivity of entrepreneurs would vary

directly with an economically rational value orientation. Hobbs and others (1964) chose to measure economic productivity using management return, a residual measure allocating net farm income to its three major components and calculating a fixed rate of return to labor and capital investment. They subdivided an economically rational value orientation into five less general orientations: (1) relative value placed on economic ends, (2) orientation toward science and scientific methods, (3) relative value placed on mental as opposed to physical processes in farm operations, (4) relative value placed on independence in decision-making, and (5) relative value placed on risk aversion.

Value scales were developed for each of these five dimensions. Four of the five value dimensions were found to be significantly correlated with economic productivity as measured by management return. If these scales reflect aspects of an economically rational orientation, farmers obtaining higher scores on these scales could be expected to exhibit higher use patterns for Telfarm, giving them more information on their performance records.

Agricultural economists refer to the necessity of accurate records in order to maximize farm income by selecting combinations of enterprises and practices appropriate to the particular farm situation. It could be expected that farmers

possessing a high degree of orientation toward economically rational values would be more inclined to utilize a channel of communication carrying information about their farm, than would farmers who were less concerned with economic rationality.

> General Hypothesis 1: Farmers with a higher degree of economically rational value orientation will utilize Telfarm more than those with a lower degree of economic rationality.

The behavior of farmers is economically rational when it is oriented toward the attainment of economic goals, and when the means selected by the farmer are the most appropriate ones to attain this end. An economically rational value orientation will be indicated by a positive valuation of the relative emphasis placed on economic goals, orientation toward scientific methods and science, and independence in decision-making.

The farmer's utilization of the Telfarm records will be viewed as their consumption of the media content of the channel. The emphasis will be placed on their total unaided use of the channel.[1] Two different measures of consumption

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[1] Unaided use places the emphasis on the farmer's utilization of the channel, aided use is not always sought by the recipient.

will be used, the amount of time spent, and the farmer's perception of his intensity of use of particular message elements of the records. The totals of the two subparts will be used as a measure of the total unaided use of the channel.

> Empirical Hypothesis 1a: Farmers with relatively higher economic motivation scores will utilize Telfarm more than those having low scores.

Economic motivation is defined as the degree to which the farmer is oriented toward the achievement of economic goals. The scale to measure the degree of economic motivation was developed by Hobbs and others (1964). A farmer who ranks high on the scale would be extremely motivated toward the attainment of economic goals. Farmers who rank low on the scale are more oriented toward goals which are non-economic and compete with the maximization of economic return.

> Empirical Hypothesis 1b: Farmers with relatively higher scientific orientation scores will utilize Telfarm more than those having low scores.

Scientific orientation is defined as the degree to which the farmer is oriented toward modern scientific methods or the use of scientific approaches to decision-making and farm management. The scale was developed by

Hobbs. A farmer who ranks relatively low on the scientific orientation scale would be oriented toward traditional farming methods as practiced by his parents, or farm management based on prior experience, and would generally lack the interest or ability to conduct an analytic evaluation of his farming methods. A farmer who would rank high on the scientific orientation scale would be oriented toward, and believe in the scientific method, and would use modern developments in scientific agriculture.

> Empirical Hypothesis 1c: Farmers with relatively higher independence scores will utilize Telfarm more than those having low scores.

Independence is defined as the degree to which the farmer is oriented toward individualism or autonomy in decision-making. The scale to measure the degree of independence was developed by Hobbs. A farmer who ranks high relative to other farmers on the independence scale would be expected to place a great deal of emphasis on the importance and desirability of making his own decisions without reference to others. A farmer who ranks low relative to other farmers would conversely be expected to rely more, or be influenced more, by others in his decision-making process.

General Hypothesis 2

One factor which may effect the farmer's use of Telfarm is message perplexity, as was suggested in the previous chapter. Message perplexity is defined as the distance between the level of ability necessary to assess Telfarm and the farmer's self-concept of his ability to assess the content of Telfarm. Some farmers have had prior experience with farm accounting and record systems and have sufficiently high educational levels to deal with a complex system with ease. Others find the Telfarm system extremely complex and confusing.

> General Hypothesis 2: Farmers experiencing a low degree of message perplexity will utilize Telfarm more than those experiencing a high degree of message perplexity.
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> Empirical Hypothesis 2: The message perplexity scores of Telfarm cooperators are directly and negatively related to their Telfarm unaided use scores.

Message perplexity is measured by the degree of assent which the farmer gives to several statements affecting his inability to cope with the difficulty level of the Telfarm message system.

General Hypothesis 3

The extent to which the farmer uses information from Telfarm for management decisions may depend on his perceived value of the worth of the messages. The messages carried in this system are defined by agricultural economists as being relevant to farm management. More effective farm management is a goal for all Telfarm cooperators. In other communication channels the messages may not all be relevant to a particular goal.

The farmer's perceived value of the Telfarm messages will depend on whether he thinks the messages are complete, accurate and presented in sufficient detail for his farm management purposes. The farmer's perception of the value of the messages and the farmer's perplexity level are both expected to influence the unaided use of Telfarm. If a farmer thinks that the messages are extremely valuable for farm management he may spend the extra time and trouble to decode the messages even if he finds the task difficult. However, if he feels the messages carried in the Telfarm channel are not valuable, he may only bother to use them if he finds the messages easy to decode.

Farmers may be characterized as having a high perplexity level (P) or a low one (p); they may also be divided into those having a high perceived value for the messages (V) or a low perceived value (v).

> General Hypothesis 3: Farmers with higher perceived values for Telfarm messages and low perplexity levels utilize Telfarm more than those having lower perceived values and high perplexity levels.

Farmers who do not have difficulty with the messages, and who perceive them as being valuable for farm management will have the highest Telfarm unaided use scores for the messages.

> Empirical Hypothesis 3a: Farmer type p-V will have higher Telfarm unaided use scores than farmer types P-V, p-v, or P-v.

Those farmers who find the messages most difficult and not highly relevant or useful for farm management will make least unaided use of the Telfarm messages.

> Empirical Hypothesis 3b: Farmer type P-v will have lower Telfarm unaided use scores than farmer types p-v, P-V, or p-V.

General Hypothesis 4

The extent to which the farmer selects and uses messages from the Telfarm reports may also depend on whether

he perceives that there are alternate channels through which he might obtain similar information. Feedback of information about the farm may be necessary for today's farmer, but it can be obtained in several different ways. Traditional farmers may emphasize the memorization of such information or follow the methods used by their parents. Other farmers may keep their own record or account books. The existance of perceived alternatives (to Telfarm) to the farmer will depend on whether he regards them as performing similar functions. He may recognize that instead of participating in Telfarm, he could keep less comprehensive books himself, but this may not be regarded as a substitute.

The identification of an alternative to Telfarm implies a potential conflict situation. It is usually possible to classify conflict or decision-making situations into three varieties: First, those involving unacceptable situations, where the respondent is able to identify an alternative, but it is not good enough. Secondly, those situations in which the respondent knows the probability of various outcomes, but cannot identify a most preferred alternative. Lastly, those situations where the respondents do not know the probability of various outcomes and cannot

identify a most preferred alternative. These three situations could be summarized as involving conditions of unacceptability, incomparability and uncertainty. The situation under consideration here most probably involves the first condition or unacceptability. The farmer may be aware of the alternatives to Telfarm, such as keeping a farm account book himself, but does not consider it as satisfactory for management purposes.

It is expected that farmers will make differential amounts of unaided use of the Telfarm messages depending on both the perplexity level of the farmer and his perception of laternates to the Telfarm system.

Farmers may be divided into two types: those perceiving other substitutable message sources to Telfarm (A), and those who do not perceive alternatives (a). The definition of an alternate message channel is left to the individual farmer. If the farmer perceives Telfarm as being a complete and sophisticated system which is necessary for farm management, he may not think that a more basic system such as the farm account book is an alternative.

General Hypothesis 4: Farmers with no perceived alternative to Telfarm and low perplexity levels will utilize Telfarm more than those perceiving an alternative and having high perplexity levels.

Farmers who do not find that the messages are difficult, and who feel that there are not alternative sources of these messages will have the highest use scores. The lowest use of messages will be by those who find the messages difficult and who feel that there are alternative sources available.

If a farmer feels that there is an alternative to Telfarm which could be satisfactory to him, he may be less likely to use the Telfarm reports, particularly if he finds the reports difficult to understand or decode. However, if the farmer feels that there is no other satisfactory alternative to the Telfarm system, then he may be more willing to spend the necessary time to learn how to decode the records or interpret them to his satisfaction.

Empirical Hypothesis 4a: Farmer types p-a will have higher Telfarm unaided use scores than farmer types P-a, P-A, or p-A.

Empirical Hypothesis 4b: Farmer types P-A will have lower Telfarm unaided use scores than farmer types p-a, P-a, and p-A.

CHAPTER IV

METHODOLOGY

This chapter describes how the questionnaire was designed, the sample selected, and the date gathered. The measurement development methods used for the major variables are explained. Finally, the influence of the control variables on the dependent and independent variables is discussed.

Devising The Instrument

After the hypotheses elaborated in Chapter III were developed, personal interviews were conducted with eleven farmers in Hillsdale County, Michigan, who were probed to see whether the variables could be measured using a mail questionnaire. At the conclusion of these interviews a questionnaire was developed to obtain information in line with the objectives of the study. This questionnaire also included some areas of interest to the administrators of the Telfarm Program, who agreed to sponsor the present investigation.

The questionnaire was then pretested with a few farmers to see primarily if they understood the questions, and secondly, if they were responding to the intended meanings. Some changes were made after the pretesting. Members of the Michigan State University faculty who worked with the Telfarm Program evaluated the questionnaire and suggested minor modifications. A copy of the instrument and the cover letter is included in Appendix A.

Data Gathering

The decision to utilize a mailed questionnaire was made for several reasons. It was felt that farmers who would be inclined to give at least as honest answers to a mail questionnaire from an individual who was unknown to them and not connected with the Telfarm staff, as they would to a personal interview. Since they were in the habit of receiving mailed material from the Telfarm Center, and making regular mailings back to the Center to keep their accounts up-to-date, they could be expected to have a relatively high rate of return to a mail questionnaire. Since the farmers were scattered over Michigan, personal interviewing would have been relatively more expensive.

The Chairman of the Department of Agricultural Economics at Michigan State University wished to include all cooperators in the evaluation of the Telfarm Program.

In September, 1965, a meeting was held with the seven district farm management agents and the Telfarm staff to review the purpose of the study. They were urged to encourage all cooperators to participate in the study. A letter was sent to all County Extension Offices on September 28, 1965, informing the agents that a questionnaire would soon be mailed to all Telfarm cooperators, and asking for their assistance in encouraging response.

The questionnaires were mailed October 12, 1965, and on October 22, a follow-up card was sent to all non-respondents. The questionnaire designed to test the hypotheses outlined in Chapter III was sent to one-fourth of the cooperators. By November 5, the cut-off date for returning the questionnaires, 72 percent had replied. All replies were date stamped. No attempt was made to insure 100 percent completion of all items in the questionnaire, but inspection showed that a high proportion of the respondents had replied to all questions.

Sample Selection

The decision was made to test the major hypotheses outlined in Chapter III with about 200 respondents. As a high rate of return was expected questionnaires were mailed to 314 Telfarm cooperators, or one in every four of the current members of the Program.

The Telfarm Center identifies its members with a code number, the first two-digits of which represent all Michigan counties listed in alphabetic order. Each farmer is assigned a three-digit number according to his date of sign-up with the Program in the county. Some counties, of course, had no members; Sanilac County had the highest number, 54 cooperators in 1965. For mailing and administrative purposes the usual listing was first by county alphabetically, and then by farm number, from low to high values.

The sampling procedure which was followed was to select every fourth name on the list of cooperators. This meant that one achieved a geographical distribution with the sample similar to that of the total distribution. There was no reason to suppose that this method of selection would produce a biased sample on any criterion, and it ensured

proportionate representation on the basis of county, and date of sign-up with the Program within county.

Description of Respondents

The respondents tended to be younger than the average Michigan commercial farmer. The Census data for 1959 gives the average age as 49.0 years. The respondents in the sample averaged 43.1 years, thus more closely approximating the average age for larger Michigan farms, Classes 1, 2 and 3.[1] The average age for farmers in these three categories was 45.8 years.

The present repondents tended to be above-average in years of formal education. Twenty-two percent had attended high school or less, while 40 percent had graduated from high school. Twenty-eight percent had attended college, many of these had completed a two-year short course in agriculture. Ten percent were college graduates. The Census reported that the median number of schoool years completed by

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[1] Commercial farms are divided into six economic classes on the basis of the total value of all farm products sold annually. Class 1 farms sell more than $40,000 of farm products, Class 2 sell $20,000 to $39,999, and Class 3 farms market between $10,000 and $19,999.

rural farm males in Michigan who were 25 years of age or over in 1960 was 8.8.

Twenty-six percent of the respondents were in District 6, in the South Central part of Michigan. This district also had the highest number of total cooperators in 1965. The second highest number of respondents was found in the Thumb area of Michigan, District 4. This district was also a dense district, with the agent having about 200 cooperators in a five county area. The West-Central District 7, had the third highest number.

District 2, the upper part of the Southern Peninsula; District 3, the South-Western District; and District 5, the South-Eastern District followed closely behind with from 10 to 14 percent of the respondents. The Upper Peninsula comprised District 1, and was sparsely populated with eleven respondents.

Each district farm management agent was asked to rate all of the cooperators in the present study on farm management ability. The best were to be given a rating of five, the poorest a rating of 1. Raters were instructed to use both ends of the scale, but they had difficulty giving a grade of one, since Telfarm cooperators rate generally higher than many farmers in management ability.

Seven percent of the respondents received no rating since the agents did not feel they knew the farmers sufficiently well to rate them. These were mainly new cooperators who had been in the Program less than a year.

The distribution of the respondents on farm management ability is indicated in Table 1.

The overall percentage of questionnaires returned by the sample was 72 percent. The sample was composed of 232 first year members and 82 second year members. The rate of return from the second year members was 76 percent. It was 60 percent from the members who were in the Program for less than a year. Several of these recent additions sent a letter to the author stating that they felt they had not been in the Program long enough to formulate opinions.

Representativeness of Sample

This section of the present chapter discusses four aspects of the representativeness of the sample. First, all Telfarm cooperators are compared with other Michigan farmers. Since the cooperators' farms were considerably larger than the average farm, most of the comparisons are with Economic Class 1 to 3 farms. Secondly, the sample was comprised of one in every four Telfarm cooperators, and

Table 1. Degree of farm management ability of respondents as perceived by their district farm management agent

Degree of Farm Management Ability	Number of Respondents	Percent of Repondents
1 (Lowest	12	5.3
2	29	12.8
3	71	31.4
4	64	28.3
5 (Highest)	33	14.6
No Score Assigned	17	7.5
TOTAL	226	99.9%

this sample is compared with the remaining cooperators, or three-quarters of the total number of cooperators. The latter is referred to as the remainder of the cooperators. The questionnaire which was mailed concurrently with the sample questionnaire to all other cooperators is referred to as the remainder questionnaire. Thirdly, the respondents to the sample questionnaire are compared with the non-respondents to the sample questionnaire. Finally, respondents who replied relatively late to the sample questionnaire are compared with those who replied relatively early, within two weeks of the mailing date.

Telfarm Cooperators as a Sample of Michigan Farmers

Statistics on Michigan farms were gathered as part of the 1959 Census of Agriculture. At that time there were almost 112 thousand farms, of which 15.7 percent were classified as falling in Economic Classes I through III. These larger units had farm marketings of over $10,000 per annum. The average size was 264 acres. At that time, the farm account cooperators (forerunners of Telfarm participators) were very similar to the average of the Class I, II, and III farmers on such characteristics as average acreage, average cash farm marketings plus government payments, average production expenses, and average net income.

More recent Census statistics are not available for all Michigan farms. The Crop Reporting Service of the Michigan Department of Agriculture provides estimates of the number of farms. According to their data the number of farms in Michigan has been declining at an average of 3,700 farms per year during the past decade. Projecting this rate of decline to 1964 would give a total of about 93,500 farms in Michigan. The decrease appears to be taking place almost entirely among farmers classified as Economic Class IV, V, VI, and also in the number of part-time farmers. The number of farms in Economic Class III appears to be remaining at a fairly stable level, and there has been a slight increase in the number of farms in Class I and II. However, these top two classes only formed 4.3 percent of the total number of farms in Michigan. A reasonable estimate of the number of farms in the top three size classifications would be 18,500 in 1964, or an increase of 1,000 since 1959. This would mean that about 7 percent of the large farm units are members of Telfarm.

Data were available from Telfarm cooperators who were in the Project for the year 1964. They were classified into three size groups by total investment. The smallest was under $60,000, the middle group $60,000 to $100,000, and the largest had investments of over $100,000. Of the

967 cooperators who were in the Program in 1964 and remained enrolled in 1965, 23 percent were in the smallest group, 31 percent were in the middle group, and 47 percent had total investments of over $100,000. Of the 200 cooperators who had dropped from the Program in 1965, over half were in the smallest size class. The concentration of over three-quarters of the Telfarm cooperators in the top two classes would suggest that a more appropriate comparison on the new Census data would be with Economic Classes I and II, or those having farm marketings of over $20,000.

Of the current Telfarm cooperators who had recorded their total tillable acreage in 1964, one-third fell in the 200 to 300 acreage range, another third had between 100 and 200, and the remaining third had over 300 acres. The Economic Class I to III farms in Michigan in 1959 had an average <u>total</u> acreage of 264. The average <u>tillable</u> acreage for Telfarm cooperators was 263 acres in 1964.

A comparison of Economic Class I-III farms in Michigan (with data from the 1959 Census) by selected types was made with the types of farmers enrolled in Telfarm in 1964. Dairy farms amounted to almost 55 percent of the Census farms, but 61 percent of the Telfarm cooperators. Other livestock units, such as cattle feeding, hogs, and beef formed 10 percent of the Telfarm cooperators, but 15 percent

of the Census farms. Cash grain operations were under-represented by Telfarm cooperators compared with Michigan farmers in general.

Thus Telfarm cooperators would mainly be classified as Economic Class I and II farms, where as in Michigan more farms were classified as Class V than in any other Class. Telfarm cooperators tended to have larger total acreages than the average figure for Economic Classes I through III. Cooperators were also more likely to be engaged in dairy farming than other large Michigan farms, and less likely to be engaged in other livestock operations.

Comparison of the Sample with Remainder of Telfarm Cooperators

A comparison can be made to determine whether the sample of 314 Telfarm cooperators who were selected to receive the questionnaire were representative of all Telfarm cooperators. This comparison can extend to two types of characteristics: (1) data which was collected by the Telfarm Program for those cooperators who were members in 1964, and (2) a comparison of the demographic characteristics of respondents to the present sample questionnaire with the demographic characteristics of all other Telfarm cooperators who replied to the "remainder" questionnaire. The latter was mailed concurrently to all cooperators and dealt with areas of interest to the administrators of the Telfarm Program.

There were a total of 232 cooperators in the sample who had participated in the Program in 1964. This represented 74 percent of the total sample of 314 cooperators. Of the remaining cooperators, 78 percent were in the Program for the second year.

These two samples of 232 cooperators and 735 cooperators were an exhaustive sample of all second-year cooperators. They can be compared on four characteristics: size of total farm investment, number of tillable acres, type of farm, and gross income. Table 2 indicates the total farm investment for each of the two categories. The present sample have a larger total investment per farm than the remainder sample.[1]

Table 2. Total farm investment for second-year cooperators in the sample and remaining cooperators

Size of Total Farm Investment	Present Sample	Remaining Cooperators	Total
Under $60,000	40	187	227
$60,000 - $100,000	88	209	297
Over $100,000	104	339	443
TOTAL	232	735	967

[1]Chi-square value is 10.3 which is greater than the 6.0 required for significant at the 5 percent level.

Data was available for the total tillable acreage of 219 farms in the present sample, and for 648 of the remaining cooperators (Table 3).

Table 3. Size of farm in tillable acres of second-year cooperators in the sample and remaining cooperator

Number of Tillable Acres	Sample	All Other Cooperators	Total
Less than 100 Acres	6	23	29
100 - 199	73	209	282
200 - 299	80	229	309
300 - 399	31	102	133
400 - 499	17	46	63
500 and Over	12	39	51
TOTAL	219	648	817

Using the data on file for all cooperators at the Telfarm Center, the mean acreage for the two categories was calculated. The average size for the sample was 261 acres, and for the remaining cooperators, 263 acres. No significant difference[1]

[1] Student's t is 0.21 which is less than the 1.96 required for significance at the 5 percent level.

was found between the samples in respect to the number of tillable acres.

The gross income for 228 farms in the selected sample and for 671 of the remaining Telfarm cooperators were available from the Telfarm Center. The mean gross income for the sample farms was $28,400 and for the remainder, $31,500. Thus, the sample was found to have a higher average farm investment than the remaining cooperators and a somewhat lower gross income. The difference between the sample and the remainder on average gross income is not significant.[1]

The sample participators and the remaining Telfarm cooperators (Table 4) do not appear to differ by type of farm.

Information was obtained on the age of all current Telfarm cooperators, both those included in the sample and the remainder. The cooperators were asked to check their age using 10-year interval categories and only two (in more than a thousand) did not reply. The age distribution for the two categories are shown in Table 5. The sample respondents

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[1] Student's t is 1.53 which is less than the 1.96 required for significance at the 5 percent level.

Table 4. Type of farm for second-year cooperators in the sample and remaining cooperators

	Sample	Percentage of Sample	Remaining Cooperators	Percentage of Remaining Cooperators
Part time	2	0.9	12	1.6
Specialized fruit	4	1.7	22	3.0
Specialized poultry	10	4.3	12	1.6
Cash crops	23	9.9	59	8.0
Cattle feeding	8	3.4	32	4.4
Hog	12	5.2	17	2.3
Beef & hog	2	0.9	18	2.4
Beef & cows	4	1.7	7	1.0
Specialized Southern dairy	80	34.5	239	32.6
Specialized Northern dairy	17	7.3	55	7.5
Northern dairy & potato	5	2.2	10	1.4
Southern dairy, mixed	44	19.0	140	19.0
Southern mixed	12	5.2	72	9.8
Northern mixed	9	3.9	40	5.4
TOTAL	232	100.0%	735	100.0%

Table 5. Age distribution for sample cooperators and remaining cooperators

Age Group	Sample	Percentage of Sample	Remaining Cooperators	Percentage of Remaining Cooperators
Under 30	23	10.2	77	9.2
30 - 39	71	31.4	251	30.0
40 - 49	69	30.5	288	34.4
50 - 60	53	23.5	185	22.1
Over 60	10	4.4	36	4.3
TOTAL	226	100.0%	837	100.0%

do not differ from the remaining Telfarm cooperators with respect to age distribution.[1]

The respondents to both questionnairs indicated how many years of formal education they had completed. There is no significant difference between the sample respondents and the remainder on educational attainment[2] (Table 6).

Comparison of Respondents with Non-respondents

Data were available, for all Telfarm cooperators who were involved in the Program for a second year, for size of total farm investment, size of farm in tillable acres and type of farm. Data were obtained from the Telfarm Center for 177 of the 226 respondents and 55 of the 88 non-respondents. It was not available for all cooperators since those who had been in the Program for less than a year had not yet filed their farm inventory nor general farm data.

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[1] Chi-square value is 1.25 which is less than the 6.0 required for significance at the 5 percent level.

[2] Chi-square value is 2.74 qhich is less than the 7.8 required for significance at the 5 percent level.

Table 6. Formal education completed by sample cooperators and remaining cooperators

Educational Attainment	Sample Respon-dents	Percentage of Sample Respondents	Remaining Respondents	Percentage of Remaining Respondents
Attainment high school or less	49	21.7	154	18.5
Graduated from high school	91	40.3	364	43.6
Attended college	64	28.3	215	25.8
Graduated from college	22	9.7	101	12.1
TOTAL	226	100.0%	834	100.0%

Fifteen percent of the respondents were in the smallest size category of farms having a total investment of under $60,000. Twenty-four percent of the non-respondents were in this category. There were slightly more non-respondents than respondents in the middle size category. However, non-respondents did not significantly differ from respondents in the average farm investments.[1]

A comparison of farm size in tillable acres is shown in Table 7. There were some differences between respondents and non-respondents in number of tillable acres, but no consistent trends. The data on acreage was available for these 219 farms, so the average was calculated for respondent's farms and non-respondent's farms. The farms belonging to respondents averaged about 20 tillable acres more than those belonging to the non-respondents. This difference was not significant.[2]

Dairy farms constituted 65 percent of the respondents and 56 percent of the non-respondents. Other livestock

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[1] Chi-square value is 2.94 which is less than the 6.0 required for significance at the 5 percent level.

[2] Student's t is 1.12 which is less than the 1.96 required for significance at the 5 percent level.

Table 7. Farm size in tillable acres of second-year respondents and second year non-respondents

Size of Farm in Tillable Acres	Respondents	Percentage of Repondents	Non-Respondents	Percentage of Non-Respondents
Under 100 acres	4	2.3	2	4.3
100 - 199	58	33.7	15	31.9
200 - 299	61	35.5	19	40.4
300 - 399	22	12.8	9	19.1
400 and over	27	15.7	2	4.3
TOTAL	172	100.0%	47	100.0%
Average Acreage	266.2	-	242.0	-

units were 16 percent of the non-respondents. Cash crop farms formed about 10 percent of both the respondent and non-respondent units. Mixed farms also formed a similar percentage of both the respondents and non-respondents farms. There were no sizeable differences between the respondents and non-respondents with respect to the type of farm.

There was a significant difference in farm management ability of the respondents and non-respondents.[1] Farm management agents graded most of the participants on a scale ranging from 5 for the most superior managers to 1 for the lowest ability level. Of the respondents 43 percent fell in the top two categories, while only 36 percent of the non-respondents fell in these categories.

Comparison of Early and Late Respondents

All questionnaires which were returned more than two weeks after the mailing date were classified as late responders. There were 43 late respondents and 183 early responders. No significant difference existed between

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[1] Chi-square value is 14.5 which is greater than the 11.1 required for significance at the 5 percent level.

the two categories on either age[1] or education[2]. The distribution of the early and late respondents on age is indicated in Table 8, and on education in Table 9.

Data were available for 75 percent of the early respondents and for 88 percent of the late respondents from their 1964 records on file at the Telfarm Center. The distribution of these second-year cooperators by total farm investment is shown in Table 10. There was no significant difference between early and late respondents by amount of total investment[3]. A second measure of farm size is the number of tillable acres. The distribution of early and late respondents with respect to acreage is shown in Table 11. Again there was no significant difference between the two groups[4].

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[1] Chi-square value is 2.2 which is less than the 9.5 required for significance at the 5 percent level.

[2] Chi-square value is 1.5 which is less than the 7.8 required for significance at the 5 percent level.

[3] Chi-square value is 1.3 which is less than the 6.0 required for significance at the 5 percent level.

[4] Chi-square value is 6.1 which is less than the 9.5 required for significance at the 5 percent level

Table 8. Age of early respondents and late respondents

Age Group	Early Respondents	Percentage of Early Respondents	Late Respondents	Percentage of Late Respondents
Under 30 years	17	9.3	6	13.9
30 - 39	57	31.2	14	32.6
40 - 49	57	31.1	12	27.9
50 - 59	45	24.6	8	18.6
60 and over	7	3.8	3	7.0
TOTAL	183	100.0%	43	100.0%

Table 9. Educational attainment of early respondents and late respondents

Educational Attainment	Early Respondents	Percentage of Early Respondents	Late Respondents	Percentage of Late Respondents
High school or less	39	21.3	10	23.3
Graduate from high school	74	40.4	17	39.5
Some college	54	29.6	10	23.3
College Graduate	16	8.7	6	14.0
TOTAL	183	100.0%	43	100.0%

Table 10. Total farm investment of early respondents and late repondents

Size Class	Early Respondents	Percentage of Early Respondents	Late Respondents	Percentage of Late Respondents
1	22	15.8	5	13.2
2	49	35.3	17	44.7
3	68	48.9	16	42.1
TOTAL	139	100.0%	38	100.0%

Table 11. Number of tillable acres of early respondents and late respondents

Number of acres	Early Respondents	Percentage of Early Respondents	Late Respondents	Percentage of Late Respondents
No data	5	3.6	0	0
Under 150 acres	23	16.5	3	7.9
150 - 199 acres	24	17.3	12	31.6
200 - 299 acres	49	35.3	12	31.6
300 and over	38	27.3	11	29.9
TOTAL	139	100.0%	38	100.0%

Early and late respondents were compared on their farm management ability as ranked by the district farm management agents (Table 12). There was some difference between the respondents and non-respondents, early respondents had an average ability rating of 3.15, and the late respondents had an average rating of 2.95. This difference was not significant.[1]

Control Variables

The effect of five control variables and the dependent variable (unaided use of Telfarm) was examined. The farms were divided into seven classifications by major income source. These were, in order of decreasing numerical importance: dairy, cash crops, beef cattle and feeding lot operations, mixed farming, hogs, poultry and fruit. An analysis of variance was conducted to determine whether there was any significant difference by type of farm, but none was found.[2]

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[1] Chi-square value is 9.1 which is less than the 11.1 required for significance at the 5 percent level.

[2] An F value of 1.36 was calculated,which was less than the 2.14 required for significance at the 5 percent level.

Table 12. Farm management ability of early respondents and late respondents

Farm Management Ability	Early Respondents	Percentage of Early Respondents	Late Respondents	Percentage of Late Respondents
0	11	6.0	6	13.9
1	10	5.5	2	4.6
2	26	14.2	3	7.0
3	59	32.2	12	27.9
4	47	25.7	17	39.5
5	30	16.4	3	7.0
TOTAL	183	100.0%	43	100.0%

The second control variable was size of farm, measured in number of tillable acres. This was rather a crude size variable, but neither of the two variables which would have been more satisfactory, size of total investment or a measure of income in 1964, were available for the 49 farms who were in the Program for the first year. Since number of acres and use were both continuous variables the relationship between them was examined using a product moment correlation coefficient. No significant relationship was found.[1]

Another control variable whose influence was examined was the district of the Telfarm farm management agent. There were seven areas in the state, and it was felt that differential ability on the part of the individual agents might exercise some influence over the amount of use. However, no significant difference in use was found on the basis of area.[2]

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[1] An R^2 value of 0.06 was calculated, which was less than the 0.14 required for significance at the 5 percent level.

[2] An F value of 1.12 was calculated, which was less than the 2.14 required for significance at the 5 percent level.

The fourth control variable whose effect was studied was the age of the Telfarm respondent. As this was considered a continuous variable, a correlation coefficient was calculated between age and amount of unaided use. No significant relationship was found.[1]

The final control variable considered was education. This also could be considered a continuous variable, and a correlation coefficient was determined between number of years of school completed and amount of unaided use. This relationship was found to be significant.[2]

In order to examine the effect of the control variable further, correlation coefficients were calculated between education and the three rational orientation scales. The correlation coefficients between education and economic motification, education and independence, and education and scientific orientation were calculated.[3]

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[1] An R^2 value of -0.09 was calculated, which was less than the 0.14 required for significance at the 5 percent level.

[2] An R^2 value of 0.0147 was calculated, which was more than the 0.14 required for significance at the 5 percent level.

[3] The R^2 values were found to be 0.10, 0.09, and 0.05, respectively. These were below the 0.14 required for significance at the 5 percent level.

None of the three relationships were found to be significant.

It was concluded that none of the control variables examined exerted a significant influence over the dependent variable, or the amount of unaided use of the Telfarm Program.

Construction of the Indexes

The following section gives a detailed description of the methods by which the indexes for the dependent and independent variables were constructed. Some of the interrelationships among the independent indexes are discussed. A comparison is made between the respondents' scores on three of the scales with an earlier sample of similar repondents in a previous study.

Unaided Use Index

The Telfarm unaided use index was constructed as an operational measure of the amount and intensity of utilization of the accounting system. Use is defined as the degree to which the respondent devoted his time and energy to analysis of his farm using the Telfarm data.

The unaided use index was comprised of several questions that probed the frequency and amount of use which the respondents made of their Telfarm reports. The index items were divided into two subparts and a subindex was constructed for each. The first part consisted of unaided use. Questions 9 and 10[1] covered the intensity of use for various purposes. Question 9 dealt with consideration of alternatives, problem-solving, and score-keeping as functions of Telfarm. Question 10 dealt with the intensity of use given to specific subsections of the records, such as the tax section or the annual business analysis. A final question dealt with the number of hours spent by the respondent studying his records. A subscore was constructed for the unaided use index. The subscores ranged from 10 to 38.

The unaided use index was used as the primary dependent variable. It was a better measure of the concept since it dealt with the amount of time and intensity of use which the respondent devoted to analysis of his farm records. It was felt that a great deal of the aided use was devoted to

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[1] Questions are referred to by number as they appear in the questionnaire in Appendix A.

answering the respondent's questions on bookkeeping or procedural matters. This reflected little of the respondent's concern with farm management, or with using his records. Much of this particular type of aid which was being given was undoubtedly due to the comparative newness of the Program. The correlation coefficient between the total unaided use score and total aided use score was .30.

The aided use index was composed of questions 11 and 12. The former dealt with the number of times the respondent discussed his Telfarm reports with persons in such various roles as county agricultural agent, banker, etc.. Question 12 dealt with the number of meetings attended by the respondent where Telfarm was part of the program. The subscores for aided use ranged from 1 to 16.

A total use score was computed by adding the subscores for aided use and unaided use. The correlations between individual items and the subscores, and total scores are shown in Table 13. The unaided use scores contributed more than the aided use scores to the total use score.

One of the frequently used methods of determining internal consistency is by item-total correlations. The correlation of each item with the sum of the items (or total

score) is computed, and items having a negative or relatively low correlation may be eliminated. This method gives a somewhat spurious inflation of the correlation coefficient, since the relevant item is included in the total score. However, since the alternative is extremely time-consuming, the assumption is often made that the item-total correlation is equally inflated for all items. Further, as the number of scale items increases, the spuriousness decreases.

Rational Value Orientation Scale

The assumption of economic rationality is typically utilized in economic analyses of farm business management. While the assumption of the true economic manager are not empirically met in the real world, the more closely the characteristics and behavior of farm managers approach the ideal type, the more successful they will be in goal attainment using economic criteria.

Hobbs (1964, pp 125-6) tested the hypothesis that the economic productivity of entrepreneurs varied directly with an economically rational value orientation. He developed indexes to measure five specific value orientations: (1) relative value placed on economic ends, (2) relative value placed on independence in decision-making, (3) orientation

Table 13. The coefficient of correlation of each item and subscore with the total scores for the use index

Item Number	Item Correlation with Total Score
1	.52
2	.47
3	.51
4	.48
5	.54
6	.52
7	.49
8	.32
9	.78
Subscore (Items #1-9)	.94
10	.55
11	.66
12	.32
13	.34
14	.26
15	.33
16	.57
Subscrore (Items #10-16)	.62

toward science and scientific methods, (4) relative value placed on mental activity in decision-making, and (5) relative value placed on risk aversion. The first three variables were correlated significantly with management returns. Highest relationships with management returns were found with independence, followed by economic motivation, risk aversion, scientific orientation, and mental activity.

Rational value orientation is defined as the degree to which an individual holds values, beliefs, and attitudes which are consistent with economic rationality. The concept is measured at an operational level by the degree of positive valuation of economic ends, the positive valuation and attitudes toward science, analytical methods, objectivity and autonomy in decision-making.

Rational value orientation in the present study is operationalized using the first three scales developed by Hobbs. Positive valuation of these three scales was felt to be directly related to economic productivity of the respondents. Correlation coefficients between the three scales and management returns were found to be significant at the 5 percent level in the Iowa study. The economic motivation scale was deisgned to measure the degree

to which the individual is oriented toward the attainment of economic goals. The scale consisted of 19 items or statements. Total scores ranged from 43 to 104 with a mean of 75.75, and a standard deviation of 9.27. Hobbs (1964, p. 89) administered this scale to 131 members of the Central Farm Business Association in Iowa. His range was 44 points with a mean of 75.07.

The correlation of individual items with the total scores for both the present sample and Hobbs' sample are shown in Table 14. Hobbs discarded items having r_{it}[1] values lower than .30 when he selected his final 19 attitude statements. On the basis of the present sample of Telfarm cooperators, four items failed to meet a minimum r_{it} value of .291.[2] These items were numbers 2, 8, 14 and 17.

Independence is defined as the degree to which farm operators positively value individualism or autonomy in decision-making. Low scores on the independence scale

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[1] r_{it} is the item-to-total score correlation.

[2] The minimum acceptable level of r_{it} is computed by determining the amount of independent variance of the total score contributed by each item, and adding the value of the standard error to the correlation coefficient. For an N of 226 and 20 items, the minimum was:

$$r^2 = .05 \qquad r = .224 \qquad s.e._r = \frac{1}{\sqrt{226}} = .0665$$

Minimum acceptable r_{it} is .224 plus .067, or .291.

Table 14. The coefficient of correlation of each item with total economic motivation index

Item Number	Correlation with Total Score for Present Sample	Correlation with Total Score for Hobbs' Sample
1	.46	.46
2	.21	.36
3	.54	.52
4	.34	.51
5	.50	.43
6	.49	.42
7	.53	.45
8	.19	.35
9	.30	.35
10	.47	.39
11	.32	.48
12	.39	.39
13	.43	.42
14	.22	.39
15	.47	.57
16	.43	.38
17	.26	.33
18	.31	.40
19	.28	.45

indicated dependence or referral to neighborhood norms. The scale contained 19 items, and total scores ranged from 37 to 101. Hobbs' range of 34 poinds was less. The mean score for the Telfarm cooperators was 71, while Hobbs' Iowa sample had a mean of 81. The standard deviation for the present sample was 10.7, and for Hobbs' sample was 6.9.

Correlations between the 19 individual items and the total score are shown in Table 15. Three items had negative correlations with the total scores. These three items are:

#8. A young farmer would do well to find out the opinions of more experienced farmers before making decisions.

#9. It is very important to have friends to whom one can go for opinions before making a decision.

#10. Unless farmers stick together the price situation in agriculture is going to get worse.

Most of the remaining items had higher item-total score correlations in the present sample than Hobbs obtained in Iowa.

Scientific orientation is the degree to which farm operators are positive in their attitude toward science and the use of scientific methods in farming and decision-

Table 15. The coefficient of correlation of each item with the total independence index

Item Number	Correlation with Total Score for Present Sample	Correlation with Total Score for Hobbs' Sample
1	.40	.38
2	.68	.53
3	.64	.31
4	.58	.45
5	.27	.41
6	.52	.36
7	.32	.52
8	-.19	.37
9	-.12	.34
10	.43	.48
11	.39	.32
12	.35	.37
13	.67	.46
14	.58	.33
15	.55	.42
16	.49	.43
17	.56	.48
18	-.02	.29
19	.35	.33

making. Farmers with low scores are traditional in outlook. The scientific orientation scale contained 21 items. The Telfarm cooperators' scores ranged from 41 to 123, a range of 52 points. Hobbs reported a somewhat smaller range, from 73 to 119, but he also interviewed a smaller sample, 131 compared with 226 in the present study. The average score was 77.8, and the standrad deviation was 14.6. Hobbs reported a mean score of 94.7, and a standard deviation of 6.7.

The item-total correlation coefficients are indicated in Table 16. On the whole, the statements had higher item-total correlations in Michigan than in Iowa. Item number 2 had a correlation of zero with the total score. This tem stated:

> #2. Education in valuable but it will never be as valuable as experience for success in farming.

Two other items, numbers 6 and 12, fell below the acceptable r_{it} value of .29 with item-total correlations of .26 and .25. Eighteen of the 21 items had lower average scores in Michigan than in Iowa, and this contributed to a mean total score about 17 points lower than for Hobbs' sample.

Table 16. The coefficient of correlation of each item with the total scientific orientation index

Item Number	Correlation with Total Score for Present Sample	Correlation with Total Score for Hobbs' Sample
1	.35	.33
2	.00	.44
3	.66	.31
4	.50	.44
5	.62	.29
6	.26	.39
7	.67	.31
8	.69	.37
9	.55	.29
10	.66	.43
11	.49	.33
12	.25	.33
13	.46	.38
14	.51	.38
15	.31	.42
16	.67	.30
17	.64	.54
18	.60	.29
19	.47	.38
20	.69	.39
21	.63	.43

Relationships Between Rational Value Orientation Scales

The correlation between scores on the economic motivation scale and scientific orientation was .37; between economic motivation and independence, .12; and between independence and scientific orientation, .50. Hobbs found the correlation between the first pair to be .11, between the second pair the correlation was .12 (identical to the obtained value in Michigan), and for the final combination the correlation was .20. The three correlation coefficients obtained between the scales for the Telfarm cooperators were significantly different from zero at the 5 percent level of significance. While the three scales were inter-related, the explained common variance was .224, giving a coefficient of alienation value of .279.

It is useful to examine the correlations between the dependent variable and the independent variables while controlling on third variables that might affect the dependent-independent relationship. Sometimes a calculated correlation coefficient between two variables reflects a relationship due to common variation with a third variable.

Table 17 shows the three partial correlation coefficients between the rational value orientation scales.

Table 17. Partial correlation values between the three rational value orientation scales

Zero-Order Correlation Between the Dependent and Independent Variable	Control Variable Whose Effect is Held Constant	Partial Correlation Value
Economic motivation (X_1) and scientific orientation (X_2); r = .37	Independence (X_3)	$r_{12.3} = .36$
Economic motivation (X_1) and independence (X_3); r = .12	Scientific orientation (X_2)	$r_{13.2} = -.08$
Independence (X_3) and scientific orientation (X_2); r = .50	Economic Motivation (X_1)	$r_{23.1} = .49$

By partialing on scientific orientation scores, the correlation between economic motivation and independence almost vanishes. Thus, economic motivation as such has no association with the independence scale, the r of .12 exists because of the mutual association of these two variables with the scientific orientation scale. In the case of the other two relationships examined, the zero-order correlations and the first-order partial correlations were similar. Thus, independence scores do not affect the relationship of economic motivation and scientific orientation; similarly, economic motivation scores do not affect

the relationship between independence and scientific orientation.

Message Perplexity

Message perplexity is defined earlier to include both the relative degree of complexity of the messages and the ability of the farmer to assess the message adequately. Three questions were used to construct a perlexity index, numbers 14, 15 and 16 in the questionnaire (Appendix A). The first question dealt with the relative ease or difficulty with which the respondent could interpret Telfarm reports. About 35 percent of the respondents reported with some degree of difficulty. The second question dealt with the amount of help required from others in order to interpret the Telfarm reports. About 76 percent of the respondents felt that they required some amount of help. A sub-total was constructed from these two questions since they differed in format from the next question.

The third question in the perplexity index consisted of seven statements each reflecting difficulty with some aspect of the Telfarm accounting system. The respondents were asked to score each on a 5-point agree-disagree dimension. A second sub-total was composed of the scores

on the seven attitude statements. A total perplexity score was formed from the two sub-totals.

The lowest possible score on the perplexity index is 9 points and the highest possible is 42 points. A high score indicated greater perplexity. The actual range for the respondents was 9 to 37. The mean value was 22 for the Telfarm cooperators, and the standard deviation was 6.3. Table 18 indicates the relationships between the score items, the subscores, and the total perplexity score.

Table 18. The coefficient of correlation of each item and subscores with the total perplexity index

Item Number	Correlation with Total Score
1	.74
2	.50
Subscores (items #1-2)	.74
3	.71
4	.55
5	.79
6	.75
7	.78
8	.61
9	.79
Subscores (items #3-9)	.99

The items all had satisfactory r_{it} values with the total score. A satisfactory scale could have been constructed using the attitude statements in Question 16 only since the subscore on the seven items had such a high correlation with the total score.

Perceived Message Value

Perceived message value is defined as the degree to which a farmer is satisfied with the Telfarm reports. The index was constructed of seven questions, numbers 1 through 7 in the questionnaire (Appendix A) each of which measured some aspect of the farmer's satisfaction or dissatisfaction with the Telfarm program. Six of the questions related to positive aspects, and four dealt with the farmer's covert feelings about the program. Two dealt with a more overt aspect, whether he had already recommended the system to other farmers or would be willing to do so. The final question dealt with the number of undesirable aspects he perceived regarding Telfarm. This item was scored negatively by subtracting it from the total score, which measured positve message value.

Scores on the total perceived value index ranged from a low of 10 to a high of 21. The mean score was 15.2, and

the standard deviation was 3.0. The item-total correlations are given in Table 19.

Table 19. The coefficient of correlation of each item with the total perceived value index

Item Number	Correlation with Total Score
1	.55
2	.68
3	.64
4	.51
5	.60
6	.73
7	.44

Perceived Availability of Alternative Message Sources

Perceived availability of alternative message sources is defined as the degree to which the farmer perceives other record-keeping systems as being satisfactory substitutes. In order to operationalize this definition a single question, number 8 (Appendix A) was utilized. This asked the cooperator whether he considered that any other system of record-keeping

other than Telfarm would be as satisfactory for his needs. Fifty-eight percent of the farmers felt that there was not a suitable substitute for the Telfarm system.

CHAPTER V

TESTING THE HYPOTHESES

The present chapter contains the findings relating to the hypotheses presented in Chapter III. Further discussion and analysis of the results is presented in Chapter VI.

General Hypothesis 1

General Hypothesis 1: Farmers with a higher degree of economically rational value orientation will utilize Telfarm more than those with a lower degree of economic rationality.

Empirical Hypothesis 1a: Farmers with relatively higher economic motivation scores will utilize Telfarm more than those having low scores.

In order to test this hypothesis a Pearsonian coefficient of correlation was computed to measure the relationship between the respondents' economic motivation scores and their Telfarm unaided use scores. The scale composed of 19 attitude statements designed to measure the respondents' degree of economic motivation was discussed

in Chapter IV. A detailed description of how the unaided use scores were computed is also given in Chapter IV. Correlation between the respondents' economic motivation scores and scores on the amount of unaided use of Telfarm is .19, which is greater than the .14 required for significance at the 5 percent level. Therefore, Empirical Hypothesis 1a is accepted. Telfarm cooperators' economic motivation scores are directly related to their use of Telfarm.

Empircal Hypothesis 1b: Farmers with relatively higher scientific orientation scores will utilize Telfarm more than those having low scores.

In order to test this hypothesis scientific orientation scores were correlated with Telfarm unaided use scores. The scale used to measure the respondents' degree of scientific orientation contained 20 items and was discussed in Chapter IV. Correlation between scientific orientation and Telfarm unaided use is -.02, which is less than the .14 required for significance at the 5 percent level. Therefore, Empirical Hypothesis 1b is rejected.

Empirical Hypothesis 1c: Farmers with relatively higher independence scores will utilize Telfarm more than those having low scores.

In order to test this hypothesis independence scores were correlated with Telfarm unaided use scores. The scale used to measure the respondents' degree of independence was developed in Chapter IV. The correlation between independence and use scores is .02, which is less than the .14 required for significance at the 5 percent level. Therefore, Empirical Hypothesis 1c is rejected.

General Hypothesis 1 is rejected. Three scales were used to measure farmers' degree of economic rationality, and two of the scales were not significantly related to the dependent variable or the Telfarm unaided use scale. The degree of economic motivation of farmers was directly and positively related to the amount of unaided use devoted to Telfarm. The degree of scientific orientation and the degree of independence of the respondents was not related to Telfarm unaided use.

Therefore, General Hypothesis 1 is rejected. Farmers with a higher degree of economically rational value orientation do not utilize Telfarm more than those with a lower degree of economic rationality.

General Hypothesis 2

General Hypothesis 2: Farmers experiencing a low degree of message perplexity will utilize Telfarm more than those experiencing a high degree of message perplexity.

Empirical Hypothesis 2: The message perplexity socres of Telfarm cooperators are directly and negatively related to their Telfarm unaided use scores.

Respondents' scores on the perplexity index and also on the perceived message value index were ranked. A split was made at the median score for both the indices. Respondents' use scores were then classified using the four-way analysis indicated in Table 20. The use scores for each cell were totaled and a mean value calculated.

Farmers with low perplexity scores had a mean use score of 22.10. Those having high perplexity scores had a mean use value of 19.55. Farmers with low perceived message value scores had a mean unaided use score of 19.88, while those who felt Telfarm was more valuable had a mean use score of 21.63.

Table 20. Mean Telfarm unaided use scores classified by respondents' perplexity scores and perceived message value scores

		Perceived Message Value		
		Low (v) n = 113	High (V) n = 113	Total
Message Perplexity	Low (p) n = 107	$\bar{X} = 22.12$	$\bar{X} = 22.06$	$\bar{X}_p = 22.09$
	High (P) n = 119	$\bar{X} = 18.55$	$\bar{X} = 21.04$	$\bar{X}_p = 19.55$
	Total	$\bar{X}_v = 19.88$	$\bar{X}_V = 21.63$	

In order to test this hypothesis perplexity scores were correlated with amount of Telfarm unaided use. The correlation between perplexity and use is -.14, equal to the value required for significance at the 5 percent level. Therefore, Empirical Hypothesis 2 is accepted.

General Hypothesis 2 is accepted, a negative relationship does exist between unaided use of Telfarm and degree of perplexity.

General Hypothesis 3

General Hypothesis 3: Farmers with higher perceived values for Telfarm messages and low perplexity levels do utilize Telfarm more than those having lower perceived values and high perplexity levels.

Empirical Hypothesis 3a: Farmer type p-V will have higher Telfarm unaided use scores than farmer types P-V, p-v, or P-v.

The previous hypothesis established that a negative relationship exists between perplexity and use. General Hypothesis 3 deals with the relationship existing between

perplexity, value and use.[1]

In order to test this hypothesis a t test was used to determine the significance of the difference between the mean Telfarm unaided use scores of farmer type p-V, and the mean unaided use scores of farmer types P-V, p-v, and P-v. Student's t value is 1.91, which is greater than the 1.64 required for significance at the 5 percent level. Therefore, Empirical Hypothesis 3a is accepted.

Empirical Hypothesis 3b: Farmer type P-v will have lower Telfarm unaided use scores than farmer types p-v, P-V, or p-V.

In order to test this hypothesis a t test was used to determine the significance of the difference between the mean Telfarm unaided use scores of farmer type P-v and the mean Telfarm unaided use scores of farmer types p-v, P-V, and p-V. Student's t is 3.42, which is greater than the 1.64 required for significance at the 5 percent level. Therefore, Empirical Hypothesis 3b is accepted.

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[1] The relationship between farmers' perceived value of Telfarm and unaided use was determined using a correlation coefficient. The correlation between value and use is .22, which is significant at the 5 percent level.

Since farmers having low perplexity scores and high message value scores have significantly higher Telfarm unaided use scores, and farmers having high perplexity scores and low message value scores have significantly lower Telfarm unaided use scores than the remaining farmers, then General Hypothesis 3 can be accepted.

The mean values for the use scores are given in Table 21. The mean Telfarm unaided use score for respondents perceiving an alternative is 19.10, while for those who did not perceive an alternative it is 21.97.

In order to test Empirical Hypothesis 4a a Student's t test was used to determine the significance of the difference between the mean Telfarm unaided use scores of farmer type p-a, and the mean Telfarm unaided use scores of farmer types P-a, P-A, and p-A. Student's t is 2.24, which is greater than the 1.64 required for significance at the 5 percent level. Therefore, Empirical Hypothesis 4a is accepted.

Therefore, farmers with higher perceived values for Telfarm messages and low perplexity levels do utilize Telfarm more than those having lower perceived values and high perplexity levels.

Table 21. Mean Telfarm unaided use scores classified by respondents' perplexity scores and perception of alternative

		Perception of Alternatives		
		Alternative Perceived (A) n = 96	No Alternative Perceived (a) n = 130	Total
Message Perplexity	Low (p) n = 107	$\bar{X}$ = 20.63	$\bar{X}$ = 22.99	$\bar{X}_p$ = 22.09
	High (P) n = 119	$\bar{X}$ = 17.96	$\bar{X}$ = 20.92	$\bar{X}_p$ = 19.55
	Total	$\bar{X}_A$ = 19.10	$\bar{X}_a$ = 21.97	

General Hypothesis 4

General Hypothesis 4: Farmers with no perceived alternative to Telfarm and low perplexity levels will utilize Telfarm more than those perceiving an alternative and having high perplexity levels.

Empirical Hypothesis 4a: Farmer types p-a will have higher Telfarm unaided use scores than farmer types P-a, P-A, or p-A.

Respondents' scores on the perplexity index were ranked and split at the median score. Respondents were also classified into those perceiving an alternative to Telfarm and those not perceiving an alternative. General Hypothesis 4 deals with the relationship existing between perplexity, perception of alternatives and use. The relationship between perplexity and use is tested by Empirical Hypothesis 2. The correlation between perplexity and Telfarm unaided use is -.14.[1] The four-way analysis was conducted as in the case of General Hypothesis 3.

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[1] The relationship between farmers perceiving an alternative and those not perceiving an alternative and Telfarm unaided use was determined using a Student's t test. The t value of 3.24 is significant at the 5 percent level.

Empirical Hypothesis 4b: Farmer types P-A will have lower use scores than farmer types p-a, P-a, and p-A.

In order to test this hypothesis a Student's t test was used to determine the significance of the difference between the mean Telfarm unaided use scores of farmer type P-A, and the mean unaided use scores of farmer types p-a, P-a, and p-A. Student's t is 3.64, which is greater than the 1.64 required for significance at the 5 percent level. Therefore, Empirical Hypothesis 4b is accepted. Since farmers perceiving no alternative to Telfarm and having low perplexity scores have significantly higher use scores, and farmers perceiving an alternative and having high perplexity scores have significantly lower use scores than the remaining farmers, General Hypothesis 4 is accepted.

Therefore, farmers with no perceived alternative to Telfarm and low perplexity levels do utilize Telfarm more than those perceiving an alternative and having high perplexity levels.

Multivariate Analysis

The research hypotheses have applied simple correlational methods to scores paired on two variables. However,

the presence of common elements and interactions between the variables demand more sophisticated analytical techniques. A variety of approaches such as analysis of variance, partial and multiple correlation, multiple linear regression, factor analysis and canonical analysis can be utilized in social science research when experimental control is difficult if not impossible.

Canonical Analysis

The major focus of the study has been on the interrelationships between variables constituting a rational value orientation of the farmers who participate in the Telfarm Program and their use of the electronic accounting system. Using partial correlation techniques it was possible to describe the interrelationships between the rational value orientation scales. However, a multivariate analysis of the rational value orientation scales using the univariate criterion of unaided use omits some possibly interesting interrelationships. Unaided use, aided use, perplexity and satisfaction are all variables describing the general attitude of the respondent to Telfarm. These variables are also interrelated as was shown in Empirical Hypotheses 2, 3 and 4.

Canonical analysis was developed by Hotelling (1935) in order to investigate the relationship between two sets of variables. His method makes it possible to determine the maximum correlation between a set of criterion variables. Canonical correlation is the maximum correlation obtained between linear functions of the two sets, when more than a single function is usually possible. Each new pair maximizes the correlation obtained, but is independent of previously obtained linear functions.

Factor analysis has some common elements with canonical analysis. Factor analysis also provides one way of looking at a large number of correlation coefficients to see whether the common variance can be expressed in more general terms. It also examines the linear relationships among the variables. However, there are at least two ways in which the two methods of analysis differ. First, canonical analysis examines the relationship between two sets of variables. Factor analysis examines the relationships within a single set. It would always be possible to include both sets as a single matrix and subject it to a factor analysis, but the primary factors extracted may express no relationship between the two original sets, since stronger common relationships may exist within the

original sets rather than between them. Secondly, canonical analysis makes it possible to apply a chi-square test of significance to each latent root extracted, thus, determining the number of significant cross correlations existing between the two sets. Tests of significance are more difficult to apply in factor analysis, either to examine the number of factors to be extracted or the number of rotations to be conducted. For some purposes it may be desirable to use both factor analysis and canonical analysis to evaluate the relationship existing between two sets of variables.

Multiple correlation examines the amount of correlation between a dependent variable and several independent variables simultaneously. The coefficient of multiple correlation depends upon both the intercorrelation existing among the independent variables, and to their correlations with the dependent variable. Canonical analysis is very similar to multiple correlation except that it allows for the examination of interrelated variables on both sides of the equation. Indeed, in the special case of canonical correlation where p, the number of predictors, is one, and q, the number of criterion variables, is greater than one, the problem is identical to multiple regression.

Koons (1962) points out that the search for methods of multivariate analysis is still on the frontier of psychological research, and that the methods need to be both mathematically defensible and readily interpretable.

The particular computer program used follows the statistical methods outlined in Cooley and Lohnes (1962). The program was written by Lohnes in 1965, and modified by A. V. Williams for use on the Control Data 3600. The two sets of variables whose relationship is being examined can be termed criteria and predictors, or variables in the left-hand matrix and in the right-hand matrix. However, computationally it is more convenient to consider the larger of the two matrices as the left-hand matrix.

Relations Between Rational Value Orientation and Use and Attitudes Regarding Telfarm

Canonical correlation can be used to tell hypotheses relating two sets of variables. The first set or left-hand matrix includes indices of attitudes toward the Telfarm Program and also of the amount and intensity of use of the Telfarm system. Attitudes and responses to the same object are included in the same matrix since they are a part of the same system.

Krech, Crutchfield and Ballachey (1962) state that the actions of the individual reflect his attitudes, and they define attitudes as enduring systems of positive and negative evaluations, emotional feelings, and pro or con action tendencies. In the definition of attitudes as systems, the emphasis is placed on the interrelatedness of the three attitude components. This can be termed the probability conception of attitude because it ties the attitude concept to observable events. Attitude measurement is thus partially equated to the probability of occurance of specific types or directions of behavioral responses.

In order to clarify the definitions of attitudinal phenomena specific definitions are necessary. Attitudes may be viewed as probabilities of specific forms of response to a specific object. Two areas of the attitudes twoard the Telfarm Program were considered as being related to the dimensions of the responses being observed. Thus the areas of satisfaction and perplexity are being measured relative to the Telfarm Program, and two different kinds of response behavior, aided and unaided use. These four variables are viewed as part of the attitude system of the respondents regarding the Telfarm Program.

The second matrix or right-hand matrix includes variables relating to a rational value orientation. To the extent that economic motivation, independence and scientific orientation are a part of a rational value orientation, they are assumed to be related to the respondent's performance of the management function of the farm.

The variables are described briefly as follows:

1. Set 1 variables representing use and attitudes regarding Telfarm are:

I_{uu} Total unaided use of Telfarm.

II_{au} Total aided use of Telfarm.

III_{p} Perplexity score.

IV_{s} Satisfaction score.

2. Set II variables representing a rational value orientation are:

I_{em} Economic motivation score.

II_{i} Independence score.

III_{so} Scientific orientation score.

Canonical correlation deals with two questions:

(1) Are use and attitudes regarding Telfarm significantly related to a rational value orientation?

(2) In what ways can the two different sets of criteria be combined to make the correlation between components of the two sets be a maximum?

Table 22 indicates the relationship between the predictors and the criteria. Table 23 summarizes the results related to the first question. The maximum canonical correlation is .22, which is significant at the 5 percent level. Therefore, the two sets are related in at least one significant manner. After the first set of canonical variates are removed, no further significant relationships remain relating the variables of Set I with those of Set II.

The largest canonical correlation of .22 is higher than any of the zero-order correlations of a variable in the first set with a variable in the second set. However, it is not a substantial increase over the largest zero-order correlation.

The contributions of the individual variables to the canonical variates are revealed by their loadings. These are indicated in Table 24. The primary use or attitude scale involved is the unaided use index. The three rational value orientation scales all contribute; the economic motivation scale contributes to the highest extent. The

Table 22. Matrix of intercorrelations between predictors and criteria

	Criteria Variables		
Predictor Variables	I_{em}	II_{i}	III_{so}
I_{uu}	.19	.02	-.02
II_{au}	.05	.09	.02
III_{p}	-.06	.11	-.04
IV_{s}	.03	-.06	-.04

Table 23. Chi-square tests of successive latent roots

Number of Roots Removed	Largest Latent Root Remaining	Corresponding Canonical R	X^2	P
0	.09	.22	19.9	<.05
1	.05	.18	9.1	>.05
2	.01	.08	1.3	>.05

Table 24. Canonical vectors of left- and right-hand matrices

Use and Attitues		Rational Value Orientation	
.99	I_{uu}	1.05	I_{em}
.15	III_{p}	.36	II_{i}
.02	II_{au}	-.70	III_{so}
.02	IV_{s}		

scientific orientation scale is related in a negative manner to the other two scales. Thus, a stronger argument could be advanced in favor of using unaided use of Telfarm as a univariate criteria than any single scale indicating a rational value orientation. The normalized function weight of .99 given to the unaided use score is sufficiently larger than .15, the next largest weight, to suggest that the other variables might be ignored in an examination of use and attitudes. Canonical correlation was employed because it was assumed that several different measures of attitude and use would prove to have a much stronger index of association with the multiple criteria of a rational value orientation.

A single criterion such as a generalized attitude measurement of the Telfarm Program could have been constructed by adding scores for each respondent on several attitude dimensions. However, such a summation procedure assumes that each area or dimension contributes equally to the total variance. This assumption did not seem reasonable. The vectors reveal that unaided use is the primary variable in the first set. The variables in the second set all reveal substantial loadings, suggesting that the inclusion of all three scales of a rational value orientation improves the adequacy with which a measure of use and attitudes toward Telfarm could be predicted.

It may be concluded that use and attitudes regrading Telfarm were significantly related to a rational value orientation in one dimension. Secondly, the way in which the two sets of variables could be combined to make the correlation between the components of the two sets a maximum, was heavily weighted with the single criteria of unaided use in the one set, but involved all three scales indicating a rational value orientation on the other.

CHAPTER VI

SUMMARY AND DISCUSSION

Summary

The study was concerned with farmers' use of an electronic farm accounting system from a communication viewpoint. Farmers' attitudes toward the channel of communication, and the degree to which they espoused a rational value orientation were examined realtive to their use of the accounting and record-keeping system.

Data were secured from 226 farmers who were enrolled in the Telfarm Program during the 1965 fiscal year. The cooperators were all located in Michigan. Indexes to measure each of the six independent and the dependent variables were constructed.

One of the purposes of the dissertation was to determine whether a high degree of economic rationality was associated with increased unaided use of the Telfarm Program. Three scales were used to indicate a rational value orientation. Only economic motivation scores were found to be significantly related to unaided use of Telfarm.

Relationships not significantly different from zero were found between unaided use and (1) independence, and (2) scientific orientation.

Farmers who had difficulty understanding the Telfarm Program, either because it was too complex or because they had insufficient training were found to use it less than farmers who had fewer problems. Cooperators who felt that the channel of communication was valuable for farm management purposes, and who had low perplexity values were found to use it more than those who had difficulty with it, or found it less valuable. Farmers who perceived possible alternatives to the Telfarm Program, and who found the system difficult, tended to have lower unaided use scores than those farmers who felt that there was no satisfactory alternative.

A canonical analysis was conducted to investigate the relationships existing between two sets of variables relevant to the Telfarm Program. One set consisted of variables measuring use of and attitudes toward the Telfarm Program. The second set consisted of variables representing a rational value orientation. It was determined that the two sets of variables were related in at least one

significant manner. However, examining the two sets of variables as groups did not result in substantial improvements over an examination of the zero-order correlations.

Much of the research in communication has focussed on voluntary exposure to channel or media content. The feedback channel known as Telfarm would offer an opportunity to control message variables which were relevant to the user for future decision-making. Some suggestions for future research were made.

Interpretation of Results

Discussion of Findings

The relationship which was found to exist between the economic motivation scale and unaided use of the Telfarm Program may be supported by several factors. The economic motivation scale may be a reliable and valid instrument to measure a rational value orientation. In the present study it was found to be related to the use of a channel of communication which would seem to be important in aiding decision-making by farmers. Another rationale which was partially suggested by the personal interviews is that the degree of emphasis placed on

maximization of economic returns by farmers, may influence the farmers' willingness to make changes in the total farm enterprise. Perhaps a factor called willingness to change, and operationally defined to include both the number and relative value of the changes which a farmer is willing to consider should be included in further research.

The lack of relationship between the independence scale and unaided use of Telfarm possibly may be attributed to lack of validity of the independence scale. Further discussion of the latter scale follows in the critique of indices section. Another possibility is that the large-scale farmers who comprise most of the Telfarm cooperators probably score relatively high on the independence scale compared with a random sample of Michigan farmers. Perhaps there is a threshold on a continuoum of farmers, ranked from extremely independent to extremely traditional, above which the relative degree of independence has little effect. Extremely traditional farmers would not be expected to utilize a farm management tool such as the Telfarm system of accounting and records. Perhaps the farmers who constitute the respondents in the present study have sufficiently high rankings on the independence scale that they do not inhibit subscribing to

the Program, but have no relationship to the amount of use made of the records.

A similar rationale may be suggested to the lack of relationship between the scientific orientation scale and unaided use. None of the respondents may be sufficiently lacking in scientific orientation to inhibit their use of modern farming techniques. Above this level the degree of scientific orientation may not be a relevant variable.

The perplexity index has the expected negative relationship to the satisfaction index. The more difficulty experienced by the farmer, the less satisfied he is with the Telfarm Program. The perplexity score also has the expected negative relationship to the unaided use score, the more difficult the farmer perceives the Program to be, the less he uses it. The relationship between the perplexity score and the aided use score is also negative, though not substantial enough to be significant. This suggests that farmers who have difficulty with the Program do not compensate for the low unaided use by seeking assistance from persons concerned with the Program.

The satisfaction index was not significantly related to any of the rational value orientation scales. It was

significantly related to both the amount of aided and unaided use made of the Program. There was some suggestion from the scores on the two use variables that either very low aided use or very low unaided use was accompanied by low satisfaction scores. Moderate use of both seemed to be accompanied by higher levels of satisfaction.

Some additional data were collected from 855 Telfarm cooperators which gave some indication of their use of a particular type of external communication channel, professional people who could be used for advice or to provide economic support. Seventy-six percent of the cooperators reported receiving one or more visits from the District Farm Management Agent. Seventy-one percent had seen the County Extension Agent at least once during the 1965 year. Twenty-one percent had seen the Agent more than three times. The local banker was seen by the 23 percent of the cooperators, and the Farmer's Home Administration representative by 20 percent. Unfortunately there was no way to ascertain whether these frequencies of visits with various professionals were higher than those of non-Telfarm cooperators.

Cooperators who were sent the additional questionnaire were asked how many meetings they had attended since

January 1, 1965 where Telfarm was an important part of the meeting. A third reported attending no meetings,a third of the cooperators had attended one meeting, and the remaining third had attended two or more meetings.

Farmers who were personally interviewed gave some indication of being high users of mass media particularly the farm oriented material. This was particularly true of the high users of the Telfarm channel.

There was some suggestions that participation in the Telfarm Project had increased some farmers use of other external channels of communication. There was also some indication of increased use of other internal channels of communication. Several farmers expressed an opinion that participating in the Telfarm Project had given them a better view on the importance of records. Two said that they intended to join the D.H.I.A. Program and one was keeping additional soil, cropping and fertilizer records on his fields.

Some additional information was available from over 500 cooperators on the use of Telfarm data for making different management decisions. It was possible to rank the following ten statements in terms of the total amount

of use given to the records by the cooperators. In order of decreasing importance these were:

1. Income tax planning.
2. Improving a farm enterprise.
3. Planning next year's financial needs.
4. Planning next year's crop and livestock programs.
5. Effects an expansion plan will have on income, net worth and debts.
6. Deciding whether or not to buy machinery.
7. Identifying the results of different cropping and feeding practices.
8. Deciding whether or not to buy more land.
9. Deciding whether or not to continue farming.
10. Planning family living expenditures.

While the rankings were indicative of the farmers' perceptions of their frequency of use of the records, it would be desirable to have collaborating evidence such as a diary of use stating which parts of the records were used for which decision.

An earlier study of the characteristics of various information sources which influenced the preference for a particular source had found accuracy to be the strongest characteristics. Some support was received for this view when farmers who indicated high use of Telfarm more frequently stated that Telfarm reports were very accurate. Low-users were more apt to state that the reports were quite accurate.

Critique of Indices

The scale measuring the total unaided use of the Telfarm Program was composed of two sub-parts. One measured the total number of hours spent with the reports over several months. While this is a frequently used unit of analysis in studies of media exposure, one disadvantage was especially apparent, this was the loss of memory of the actual number of hours spent over a long time period. Several measures of the time spent just after the farmer received a quarterly or the annual report would probably have resulted in more accurate measurement. The estimation of the total number of hours had evidently concerned some of the respondents, because during the

personal interviews one farmer said that he felt that he had underestimated the hours spent with the reports.

A second difficulty with the unaided use scale was that of obtaining an adequate measure of the amount of message use. An attempt was made to obtain both a measure of use for different purposes, and a measure of use for the different parts of the records. While these questions seemed to be quite satisfactory to analyse the types of use given the reports by individual farmers, they were not as satisfactory for purposes of ranking farmers along a total use scale. One farmer would feel that he had used the quarterly reports frequently if he looked at them four times a year for ten minutes, another would feel that spending several hours weekly with the reports constituted moderate use. Further improvement in the scale would have been achieved by ensuring that Telfarm cooperators who were in their first year of the Program had exactly the same opportunities for use as the second year cooperators.

The aided use scale used as an index the number of meetings which the farmer had with persons occupying certain roles, who could be expected to aid with the Telfarm reports. As a check on the validity of the answers it would be possible to ask a similar question to the other participant. There appeared to be occasional differences

in the perceptions of the two discussants as to the purpose of the meeting, whether it was held primarily to discuss the Telfarm Program or some other topic.

Three scales designed to measure the degree of economic motiviation, scientific orientation and independence were tested with the Telfarm cooperators. In order to further refine the three scales, individual statements which do not have acceptable levels of item-total correlations should be eliminated in future work. Four items were considered unsatisfactory in the economic motivation scale, three in the independence scale and three in the scientific orientation scale.

The earlier study conducted by Hobbs which used the three scales indicating a rational value orientation was also conducted using respondents who were members of a farm accounting and business analysis service. Farmers who avail themselves of this kind of service are usually considerably larger than average. They may not be representative of farmers in general with respect to other criteria. It would seem desirable to test the three scales with other farmers who were likely to differ with respect to social psychological characteristics.

The attempt to measure the degree of message perplexity experienced by the farmer was relatively successful, and appeared to be reasonably valid on the basis of the concluding personal interviews. However, more supporting data could be gathered to give further insights with respect to the degree of difficulty experienced with the reports. Further details on formal educational attainments could have been included such as the grade point average achieved at school and the number and nature of the County Short Courses attended on specialized topics. Since a great deal of self-instruction can be carried out by farmers themselves with the aid various media such as University bulletins and educational articles in farm magazines, it might be interesting to conduct a general knowledge test on farming matters in a future study.

A further improvement in the attempt to measure the degree of message perplexity experienced by the farmers would have been to assign them a coding task, such as entering items in the correct category and assigning them to the appropriate enterprise. The farmer's ability to decode a report sheet could also be tested using an empirical measure. This could take the form of filling in missing dollar amounts, or explaining items included in certain ratios.

Additional measures of the perceived worth of the Telfarm Program will be available early in 1966. The rate of re-enlistment in the Program would constitute an additional validity check on perceived value. It would not seem feasible to arrange for differential financial changes in a University administered activity such as the Telfarm Program.

Cooperators were asked whether they perceived any satisfactory alternatives to the Telfarm Program. There was a possibility that this should not have been considered as an all or none situation. If other systems of farm accounts had been rated on their advantages and disadvantages relative to Telfarm, then it might have been the magnitude of the relative advantage or the relative disadvantage of the other system which influenced the amount of use made of the Telfarm system.

To summarize, there were ways in which all of the indices used in the research project could have been improved. However, some would have necessitated substantial increases in the cost of gathering the data. Others would require personal interviews rather than the mail questionnaire utilized for the present project. Some questions, such as

a test of ability to understand the present reports, or asking whether the cooperators would be willing to pay more the following fiscal year would have jeopardized the University's relationship with the farmers.

Suggestions for Future Research

There are rare opportunities in communications for controlling messages or varying message formats in channels of communication where the reader or respondent is voluntarily exposed to the content. The Telfarm system would seem to be an excellent situation particularly for studying message design or layout. In many cases it is desirable to focus the farmer's attention on the relationships between certain ratios, or to suggest that some expenditures or investments are too high or low relative to other figures. Alternative experimental treatments could be tried out. Another advantage of this particular experimental situation for communication research is that the messages are all relevant to the receiver. In a great many studies in communications it is necessary to conduct an ex-post-facto examination of the respondent's interests or attitudes in order to determine whether a message was perceived as relevant.

The Telfarm Program also offers a situation for the introduction of messages suggesting the adoption of a new farming practice to the cooperators. The message content could be varied in format or amount of information, for example by promoting a new weed killer for pastures by name only, or by including a great deal of detailed material on the costs and returns of using the new weed killer and the types of pasture and soil conditions for which it was best suited. In much of the past research on the adoption and diffusion of new farming techniques or innovations are of the least explored aspects has been the degree to which the practice was economically desirable. The Telfarm Program would enable an economist to calculate the costs and returns of adopting a new practice, or of differential rates of application of a new fertilizer or herbicide. This could be caluclated for individual farm situations, and messages with differing degrees of individual relevance prepared for cooperators.

Another area which might be explored using the Telfarm Program concerns the motivations for change which are functional for different farmers. For example, if dairy farmers have low average yields of milk per cow, what are the best methods to employ to encourage farmers to

increase production? The Telfarm reports offer several possibilities. Farmers could be urged to set their own goals for a future time period and their progress charted toward this goal with every report. Their herd averages could be compared with other herds of a similar size, or with the top 10 percent of dairy farmers in the state.

The area of decision making in farm management has been difficult to explore because of the large number of factors considered relevant to any particular decision. Telfarm would offer a channel of communication where individual farmers could be asked which message elements they considered relevant to a particular decision. This could be conducted over a specific time period with frequent interviews making it possible to chart triggering versus supporting messages important for certain types of decisions.

Another area which has received less attention than it perhaps deserves is the specification of the decision making unit with respect to different areas. Some farmers who keep the books themselves appear to make all the farm decisions. On other farms where the wife keeps the books, she seems to make many of the decisions. Closer examination

of the decision making unit and the factors involved in reaching decisions in various areas might offer more guidance for persons interested in motivating change.

The influence of mass media on people's attitudes used to be viewed as a relatively simple mechanism, such as a hypodermic needle, where certain messages went in and certain effects resulted. With the investigations of the "two-step flow", and later more sophisticated research in communciation the complexities of the flow of influence are being realized. Telfarm as a feedback channel offers an opportunity to look at self-motivated change or influence versus outside inlfuence.

A great deal of Government Policy particularly in the area of agriculture is based on statistics which are gathered from voluntary record-keepers. There is increasing concern over the kinds of motivations which farmers possess to keep records, and how record keepers differ from non-record keepers. Little is known about how private these reocrds are considered by farmers. Some farmers underestimate the number of persons who have access to the files, other farmers are not concerned over the number of persons who peruse their farm financial status.

One or two Telfarm cooperators resigned from the Program because of their concern over the lack of privacy. Cooperators who feel that their records are extremely confidential may be reluctant to get aided use of their record keeping system.

The Telfarm Program appears to present an opportunity for an inter-disciplinary approach to the study of a particular communication channel and its use for decision-making and management purposes.

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APPENDICES

APPENDIX A

Letters to County Agents

Questionnaire

COOPERATIVE EXTENSION SERVICE
Michigan State University - East Lansing Agricultural Economics
and U.S.Department of Agriculture Cooperating

September 28, 1965

TO: Extension Agents

Within a few days current TELFARM cooperators and other farmers who dropped the program since January 1, 1964 will receive a questionnaire. It has a number of pages, but the questions are mainly answered by a check mark or number. The last page contains three open-ended questions in which farmers are asked to express their viewpoints and suggestions.

All TELFARM cooperators will receive a questionnaire. This includes those who were enrolled in 1964, but did not join this year. These former cooperators will receive an extra page. Most of the questions relate to their use of and attitudes toward the TELFARM program. Some 300 randomly selected cooperators will receive a slightly different questionnaire which asks about attitudes towards farming and business. You will be mailed a copy of the questionnaire going to most of the cooperators before they receive it.

The information obtained will supply the data used in a Ph.D.dissertation by Mrs. Anita McMillan, Agricultural Economics staff member and also for a Master's thesis by Harold Werth, Oregon Extension Service. From these papers and other evaluations, the TELFARM staff expects to be able to evaluate some of the strong and weak points of TELFARM, and improve its effectiveness in the future.

We hope that this effort to improve the TELFARM program has the support of you and your staff. Any encouragement which you can give farmers to complete the questionnaire will be greatly appreciated.

Sincerely yours,

John C Doneth

John C. Doneth
Extension Specialist in
Agricultural Economics

JCD:raa

COOPERATIVE EXTENSION SERVICE

MICHIGAN STATE UNIVERSITY · EAST LANSING

AND U.S. DEPARTMENT OF AGRICULTURE COOPERATING

Agricultural Economics

October 8, 1965

To: District Extension Agents--Farm Management

Dear

Attached is a master question set for the mail survey of Telfarm cooperators. All of the 1251 current Telfarm members plus most of the former members (184) will be surveyed.

Three different assemblies are drawn from the master set. Three-fourths of the current members receive all the white pages in the master set (except for the single sheet for those who dropped the program).

The remaining one-fourth of the current members receive a question set printed on cream paper. This set includes all of the pages in the master, and 4a through 7a.

A screened list of former Telfarm members receive all of the white pages of the master set, plus the single sheet for droppers.

Current members will be identified by attaching their address label to the top of page c. They can be assured of confidentiality. Former members will not be identified, hoping that they will then feel less hesitancy in answering.

Thank you very much for your prompt and complete answers to the drop list question. We will have this mailing list corrected according to your instructions. Also enclosed is a copy of the letter to the Extension Agents so that you are kept informed of all mailings.

Yours sincerely,

Anita McMillan (Mrs.)
Agricultural Economics

AM:ng
Enclosures

COOPERATIVE EXTENSION SERVICE

MICHIGAN STATE UNIVERSITY • EAST LANSING

Agricultural Economics

AND U.S. DEPARTMENT OF AGRICULTURE COOPERATING

October 8, 1965

To: Extension Agents

Enclosed is a copy of the Telfarm study questionnaire about which you have been previously informed.

Three-fourths of the current cooperators will receive this questionnaire. The remaining one-fourth will receive a questionnaire printed on cream colored paper which is the same as the enclosed except for pages 4 through 7. This section is replaced by questions of a more general nature.

A screened list of former Telfarm cooperators will also receive the enclosed questionnaire with an appropriate cover letter. They are asked to fill out the forms on the basis of their year's experience. The District Farm Management agents screened the former member list to remove those who they felt should not be contacted.

You can help make this study a success by encouraging Telfarm farmers in your county to complete and return the questionnaire.

Yours sincerely,

Anita McMillan

Anita McMillan (Mrs.)
Extension Specialist

AM:ng
Enclosure

COOPERATIVE EXTENSION SERVICE

MICHIGAN STATE UNIVERSITY • EAST LANSING

Agricultural Economics

AND U.S. DEPARTMENT OF AGRICULTURE COOPERATING

October 6, 1965

Dear TELFARM Cooperator:

You have now been a member of the TELFARM program for 9 months or longer. The Department of Agricultural Economics is anxious to know how YOU feel about the program. We want to make it even better in the future.

ALL TELFARM cooperators are receiving a questionnaire. We ask for your cooperation in completing it. Your responses will be kept confidential. The answers will be tabulated and summarized by the computer. The questionnaire may seem a bit lengthy, but it only requires about 15 minutes of your time.

We know that this is a busy time for you, but:

PLEASE RETURN AS SOON AS POSSIBLE, NO LATER THAN 10 DAYS.

You will be seeing summaries of the results of the questionnaire in the TELFARM Transmitter. We can assure you that we will make whatever improvements we can when we find out how all the people who have participated in the program feel about it.

Yours sincerely,

Anita McMillan

Anita McMillan (Mrs.)
Agricultural Economics

Your name and address appears above. When the questionnaire is returned this will become a code number. All questionnaires should be returned by October 18.

We would like the person making most of the farm management decisions to complete the questionnaire.

If other than the person indicated above completes the questionnaire, please sign below.

1. Name of person (if different than above)_____

2. What age group are you in?

☐ Under 30
☐ 30 - 39
☐ 40 - 49
☐ 50 - 59
☐ 60 and over

9)_____

3. Please check your formal educational background.

☐ Attended high school (or less)
☐ Graduated from high school
☐ Attended college
☐ Graduated from college

10)_____

4. (a) Do you think it would be a good idea to have county or district associations for TELFARM cooperators?

☐ No, don't think so
☐ Might be
☐ Yes, good idea

11)_____

(b) IF YOU CHECKED YES OR MIGHT BE: What kind of activities would you like this association to perform?
Activities I would suggest:

1)_____

2)_____ 12)_____

3)_____ 13)_____

4)_____

Most programs have good points and bad points. We'd like to know how you would rate TELFARM.

1. First, bad points. Do you think that TELFARM has:

   ☐ No bad points — 14)____
   ☐ A few bad points
   ☐ A great many bad points

2. Now, good points. Do you think that TELFARM has:

   ☐ No good points — 15)____
   ☐ A few good points
   ☐ A great many good points

3. Thinking about TELFARM in general, would you say that you have been:

   ☐ Extremely dissatisfied — 16)____
   ☐ Quite dissatisfied
   ☐ Neutral
   ☐ Quite satisfied
   ☐ Extremely satisfied

4. If you could dream about the ideal system of farm records and give it a rating of 10 points, how many points would you give TELFARM?

   Number of points for TELFARM____ — 17,18)____
   (ideal system rates 10 points)

5. (a) Have you recommended TELFARM to any other farmers?

   ☐ No
   ☐ Yes — 19)____

   (b) If yes, about how many farmers?

   Number of farmers____ — 20,21)____

6. Would you recommend TELFARM to another farmer?

   ☐ Certainly
   ☐ Perhaps — 22)____
   ☐ Probably not

7. If you compared TELFARM with your PREVIOUS SYSTEM of keeping farm records, would you say that TELFARM was:

   ☐ Much more satisfactory
   ☐ More satisfactory — 23)____
   ☐ About the same
   ☐ Less satisfactory
   ☐ Much less satisfactory

8. Do you consider that any other system of farm record keeping that you know about would be as satisfactory for YOUR needs as TELFARM?

☐ Probably so 24)_____
☐ Perhaps
☐ Probably not

9. If you think about HOW you have used the TELFARM reports, we'd like to know how much you have used it for:

(a) DECIDING WHICH COURSE OF ACTION WOULD BE BEST.

☐ Haven't used it for this 25)_____
☐ Used it a little for this
☐ Used it a good deal for this

(b) FINDING WHAT KIND OF PROBLEMS I HAVE, WHAT KINDS OF THINGS I SHOULD LOOK INTO.

☐ Haven't used it for this
☐ Used it a little for this 26)_____
☐ Use it a good deal for this

(c) HOW WELL I'M DOING.

☐ Haven't used it for this
☐ Use it a little for this 27)_____
☐ Use it a good deal for this

10. Considering the TELFARM reports which you receive, tell us how much use each of the following has been to you. (check once on each line)

		Amount of Use			
		Very Little	Moderate	A Great Deal	
(a)	Tax	_____	_____	_____	28)_____
(b)	Income & expense, detailed	_____	_____	_____	29)_____
(c)	Income & expense, summary	_____	_____	_____	30)_____
(d)	Annual business analysis	_____	_____	_____	31)_____
(e)	Enterprise reports (optional)	_____	_____	_____	32)_____

11. Since Jan. 1, 1965, about how many times have you discussed your farm analysis (using TELFARM) with each of the following people?

		Number of times	
(a)	TELFARM district farm management agent	_____	33)_____
(b)	County extension agent or director	_____	34)_____
(c)	Vocational agriculture teacher	_____	35)_____
(d)	Local banker	_____	36)_____
(e)	F. H. A. representative	_____	37)_____
(f)	P. C. A. representative	_____	38)_____

12. Since Jan. 1, 1965, about how many meetings have you attended where TELFARM was an important part of the program.

Number of meetings_____ 39,40)_____

13. Now, thinking about the time you have spent either alone or with your family going over the reports which you have received from TELFARM center, could you please give an estimate of the number of hours spent since January 1, 1965?

Number of hours_____ 41,42)_____

14. How easy or difficult are the TELFARM reports for you to interpret?

☐ Very difficult
☐ Quite difficult
☐ Quite easy
☐ Very easy

43)_____

15. To use the TELFARM reports most effectively, do you think you need more training or help than you have now?

☐ Yes, a great deal more
☐ Yes, a little more
☐ No, I can manage now

44)_____

16. Here are some critical comments on the TELFARM reports. Please be frank, and tell us whether YOU agree or disagree with each statement.

DRAW A CIRCLE AROUND THE ANSWER WHICH BEST REPRESENTS YOUR OPINION.

	-SA- strongly agree	-A- agree	-U- uncertain or undecided	-D- disagree	-SD- strongly disagree	
(a)	I don't have the time to understand them.	SA	A	U	D	SD 45)_____
(b)	I'm not interested in the amount of detail in them.	SA	A	U	D	SD 46)_____
(c)	It's difficult for me to figure out the way the reports are organized.	SA	A	U	D	SD 47)_____
(d)	I don't know how to pick out the important figures for my farm operation.	SA	A	U	D	SD 48)_____
(e)	I need more help to cope with the reports.	SA	A	U	D	SD 49)_____
(f)	If I'd had more schooling perhaps I could understand those reports better.	SA	A	U	D	SD 50)_____
(g)	It's difficult to find the figures I'm looking for.	SA	A	U	D	SD 51)_____

Here are some statements about farming and business. You will probably agree with some of the statements and disagree with others. There are no right or wrong answers. What is wanted is your own individual feeling about the statements. Read each statement and decide how YOU feel about it.

-SA-	-A-	-U-	-D-	-SD-
strongly agree	agree	undecided or uncertain	disagree	strongly disagree

DRAW A CIRCLE AROUND THE ANSWER WHICH BEST REPRESENTS YOUR OPINION.

1.	Probably the best guide in making decisions is what has worked in the past.	SA	A	U	D	SD	14)____
2.	People who have been at least moderately successful financially seem to contribute more to community life than people who don't have money.	SA	A	U	D	SD	15)____
3.	In the long run it's generally better to go along with the thinking of the majority than to push for the acceptance of one's own ideas.	SA	A	U	D	SD	16)____
4.	Farming today is more a science than an art.	SA	A	U	D	SD	17)____
5.	Most people in this country are evaluated first on the basis of material accomplishments and secondly on other things.	SA	A	U	D	SD	18)____
6.	Farming would be extremely difficult without the advice and help of neighbors.	SA	A	U	D	SD	19)____
7.	It is more important to me to be known as a person who gets along well with others and has a lot of friends rather than a person who likes to make decisions for himself.	SA	A	U	D	SD	20)____
8.	There are too many other important things in life to spend your time trying to make a few extra dollars.	SA	A	U	D	SD	21)____
9.	Farming is first of all a business in which the major goal is profit and secondly a healthy and rewarding place to raise a family.	SA	A	U	D	SD	22)____
10.	I feel that research information put out by agricultural colleges is just as good to go on as if I had tried it on my own farm.	SA	A	U	D	SD	23)____
11.	Even if his income has dropped to a low point a farmer should try to stick it out so his children can grow up on the farm.	SA	A	U	D	SD	24)____

12.	Man's future depends primarily upon the technical advances made by scientific research.	SA	A	U	D	SD	25)____
13.	Good management is the application of scientifically developed principles.	SA	A	U	D	SD	26)____
14.	In deciding whether or not to try a new practice a farmer's first consideration should be "is it profitable?"	SA	A	U	D	SD	27)____
15.	Farmer's problems will probably never be solved by collective action.	SA	A	U	D	SD	28)____
16.	A farmer can no longer afford to make his decisions independently.	SA	A	U	D	SD	29)____
17.	One of the best ways to improve income in agriculture would be to reduce the number of farmers so that those remaining could have a higher income.	SA	A	U	D	SD	30)____
18.	Everything considered, all of the scientific developments in this country have done about as much harm as good.	SA	A	U	D	SD	31)____
19.	The best thing a young farmer can do is to learn as much as he possibly can about new developments in agriculture.	SA	A	U	D	SD	32)____
20.	People who have been successful financially are generally more interesting people to visit with.	SA	A	U	D	SD	33)____
21.	Farmers really don't have to think a great deal about what they are going to do on their farms since this is largely decided for them by their land and by the kind of practices followed in the neighborhood.	SA	A	U	D	SD	34)____
22.	The best way to compete in agriculture today is to apply the latest scientific research.	SA	A	U	D	SD	35)____
23.	Actually I really don't care too much what my neighbors think of the way I farm.	SA	A	U	D	SD	36)____
24.	Families with modest incomes are really happier than those who have lots of money.	SA	A	U	D	SD	37)____
25.	I would much rather give up a part of my freedom to make decisions than to be forced out of farming entirely.	SA	A	U	D	SD	38)____
26.	A farmer can generally get more useful and practical information from other farmers than from the county extension director.	SA	A	U	D	SD	39)____

27.	Many people who are really respected in the community have not done so well financially.	SA	A	U	D	SD	40)____
28.	One of the greatest lessons a young man can learn is to make his own decisions.	SA	A	U	D	SD	41)____
29.	The basic principles of farming really haven't changed much in the last 30 years.	SA	A	U	D	SD	42)____
30.	Probably the greatest satisfaction in farming is making it pay.	SA	A	U	D	SD	43)____
31.	In a democracy like ours the way of the majority is usually the right way.	SA	A	U	D	SD	44)____
32.	Many farmers have become so scientific they have forgotten the importance of good practical judgment.	SA	A	U	D	SD	45)____
33.	It is very important to have friends to whom one can go for opinions before making a decision.	SA	A	U	D	SD	46)____
34.	On the whole a farmer can get better information from specialists and farm magazines than he can from his neighbors and relatives.	SA	A	U	D	SD	47)____
35.	In farming the successful man is the one who makes the most profit.	SA	A	U	D	SD	48)____
36.	Sooner or later farmers must come to recognize that they are in competition with each other.	SA	A	U	D	SD	49)____
37.	Education is valuable but it will never be as valuable as experience for success in farming.	SA	A	U	D	SD	50)____
38.	A young farmer would do well to find out the opinions of more experienced farmers before making decisions.	SA	A	U	D	SD	51)____
39.	Unless farmers stick together the price situation in agricaulture is going to get worse.	SA	A	U	D	SD	52)____
40.	Material success is a very important goal in life.	SA	A	U	D	SD	53)____
41.	In this day and age a person can no longer afford to be independent and to rely on his own judgment in making decisions.	SA	A	U	D	SD	54)____
42.	The only real objective in farming is to make a profit.	SA	A	U	D	SD	55)____
43.	A farmer's standing in the community actually depends in large part on how successful he is financially.	SA	A	U	D	SD	56)____

44.	One of parent's greatest obligations is to teach their children to make decisions on their own uninfluenced by what others may say or do.	SA	A	U	D	SD	57)____
45.	One of the major problems in our country today is that people are too concerned with money and the things money will buy.	SA	A	U	D	SD	58)____
46.	In making management decisions one of the important factors to be taken into consideration is what your neighbors will think about you for doing it that way.	SA	A	U	D	SD	59)____
47.	Having a lot of friends is a more important goal in life than being a success financially.	SA	A	U	D	SD	60)____
48.	People who do agricultural research really do not have an appreciation of the farmer's problems.	SA	A	U	D	SD	61)____
49.	Having the freedom to make up my own mind is, to me, one of the major advantages in farming.	SA	A	U	D	SD	62)____
50.	If I were really truthful with myself it is very important to me that my neighbors approve of the way I farm.	SA	A	U	D	SD	63)____
51.	Research information is a necessity to a farmer in making decisions.	SA	A	U	D	SD	64)____
52.	There is really no reason for man to explore outer space.	SA	A	U	D	SD	65)____
53.	In general the farmer with the most education is the most successful.	SA	A	U	D	SD	66)____
54.	Time spent by the farmer in finding out about new ideas and practices in farming is time well spent.	SA	A	U	D	SD	67)____
55.	There are so many desirable things about farming that a person can afford to get along on a lower income to maintain these advantages.	SA	A	U	D	SD	68)____
56.	Much of the research information farmers receive is too impractical to be of value.	SA	A	U	D	SD	69)____
57.	The principles of management of other fields can't be applied to farming.	SA	A	U	D	SD	70)____
58.	The major reason for going to college is to be able to make a better income.	SA	A	U	D	SD	71)____
59.	Older, more experienced farmers in the community are probably the best source of information on farming ideas and practices.	SA	A	U	D	SD	72)____

Here are some of the kinds of information you sent to TELFARM and uses of this information. The descriptions of both the reported information and uses are very short ones. When you answer these questions, will you think about ALL OF THE USES to which you have put each kind of information.

1. The table on which you report MONTHLY LABOR is used to measure labor efficiency. How worthwhile is this to you?

   ☐ Very worthwhile 46)_____
   ☐ Fairly worthwhile
   ☐ Worth very little

2. The FARM MAP on which you annually report acres, yields, ownership and soil data is used to verify production and keep a record of cropping practices. How worthwhile is this to you?

   ☐ Very worthwhile 47)_____
   ☐ Fairly worthwhile
   ☐ Worth very little

3. The CREDIT INFORMATION you report is used to calculate quarterly credit summaries of loan and loan payments and for net worth statements.

   (a) Do you report farm credit information?

   ☐ No 48)_____
   ☐ Yes

   (b) If yes, how worthwhile are the credit summaries?

   ☐ Very worthwhile 49)_____
   ☐ Fairly worthwhile
   ☐ Worth very little

4. ENTERPRISE ANALYSIS summaries are calculated if you report enough information.

   (a) Have you received any enterprise summaries?

   ☐ No 50)_____
   ☐ Yes

   (b) If yes, how worthwhile are they to you?

   ☐ Very worthwhile
   ☐ Would be more worthwhile if complete 51)_____
   ☐ Hasn't been worthwhile

   (c) Are you going to try to keep any enterprise records next year?

   ☐ Yes 52)_____
   ☐ No
   ☐ Haven't decided yet

5. Here are some statements which farmers have made about TELFARM. You will probably agree with some, and disagree with others. We would like to know how YOU feel about each of these statements.

DRAW A CIRCLE AROUND THE ANSWER WHICH BEST REPRESENTS YOUR OPINION.

-SA- strongly agree -A- agree -U- undecided or uncertain -D- disagree -SD- strongly disagree

(a) My county Extension agent (or director) has given me a lot more help since I joined TELFARM. SA A U D SD 53)_____

(b) The tax savings alone can justify my belonging to TELFARM. SA A U D SD 54)_____

(c) I have felt closer to the University since I joined. SA A U D SD 55)_____

(d) I get too much paper back from TELFARM, there just isn't time to look through it all. SA A U D SD 56)_____

(e) The most up-to-date farmers I know have joined TELFARM. SA A U D SD 57)_____

(f) The TELFARM reports aren't worth as much to me as the management help which I get from other people because I joined. SA A U D SD 58)_____

(g) I'm not so sure that it was worth it last year, but I expect to get more out of it in the future. SA A U D SD 59)_____

6. Who collects and records each of the following kinds of records YOU SEND TO the TELFARM center?

(a) Day to day financial entries on form 2. 60)_____
Husband__, Wife__, Both__, Other__

(b) Capital transactions on form 3. 61)_____
Husband__, Wife__, Both__, Other__

(c) Livestock information on form 3. 62)_____
Husband__, Wife__, Both__, Other__

(d) Labor records on form 3. 63)____
Husband__, Wife__, Both__, Other__

(e) Crop records on forms 2 and 10. 64)_____
Husband__, Wife__, Both__, Other__

7. a. On the whole do you feel that the reports that YOU RECEIVE FROM the TELFARM center have been:

☐ Very accurate
☐ Quite accurate
☐ Quite inaccurate

61) _____

b. If you have found mistakes, have they been:

☐ Mainly errors in reporting
☐ Mainly errors made by the computer center
☐ Some of each

62) _____

8. If you thought about the biggest ADVANTAGE of TELFARM to you, what would you say it was?

Biggest advantage_____

_____ 63,64) _____

_____

_____

_____

_____

_____

9. If you thought about the biggest DISADVANTAGE of TELFARM, what would you say it was?

Biggest disadvantage_____

_____ 65,66) _____

_____

_____

_____

_____

_____

10. If you could make one CHANGE in the TELFARM program, what would it be?

The change I'd most like to see made_____ 67,68) _____

_____

_____

_____

_____

_____

COOPERATIVE EXTENSION SERVICE

MICHIGAN STATE UNIVERSITY • EAST LANSING

Agricultural Economics

AND U.S. DEPARTMENT OF AGRICULTURE COOPERATING

October 6, 1965

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Yours sincerely,

Anita McMillan

Anita McMillan (Mrs.)
Agricultural Economics

Your name and address appears above. When the questionnaire is returned this will become a code number. All questionnaires should be returned by October 18.

We would like the person making most of the farm management decisions to complete the questionnaire.

If other than the person indicated above completes the questionnaire, please sign below.

1. Name of person (if different than above)_____

2. What age group are you in?

- ☐ Under 30
- ☐ 30 - 39
- ☐ 40 - 49
- ☐ 50 - 59
- ☐ 60 and over

9)_____

3. Please check your formal educational background.

- ☐ Attended high school (or less)
- ☐ Graduated from high school
- ☐ Attended college
- ☐ Graduated from college

10)_____

4. (a) Do you think it would be a good idea to have county or district associations for TELFARM cooperators?

- ☐ No, don't think so
- ☐ Might be
- ☐ Yes, good idea

11)_____

(b) IF YOU CHECKED YES OR MIGHT BE: What kind of activities would you like this association to perform?
Activities I would suggest:

1)_____

2)_____ 12)_____

3)_____ 13)_____

4)_____

Most programs have good points and bad points. We'd like to know how you would rate TELFARM.

1. First, bad points. Do you think that TELFARM has:

   ☐ No bad points — 14)____
   ☐ A few bad points
   ☐ A great many bad points

2. Now, good points. Do you think that TELFARM has:

   ☐ No good points — 15)____
   ☐ A few good points
   ☐ A great many good points

3. Thinking about TELFARM in general, would you say that you have been:

   ☐ Extremely dissatisfied — 16)____
   ☐ Quite dissatisfied
   ☐ Neutral
   ☐ Quite satisfied
   ☐ Extremely satisfied

4. If you could dream about the ideal system of farm records and give it a rating of 10 points, how many points would you give TELFARM?

   Number of points for TELFARM____ — 17,18)____
   (ideal system rates 10 points)

5. (a) Have you recommended TELFARM to any other farmers?

   ☐ No
   ☐ Yes — 19)____

   (b) If yes, about how many farmers?

   Number of farmers____ — 20,21)____

6. Would you recommend TELFARM to another farmer?

   ☐ Certainly
   ☐ Perhaps — 22)____
   ☐ Probably not

7. If you compared TELFARM with your PREVIOUS SYSTEM of keeping farm records, would you say that TELFARM was:

   ☐ Much more satisfactory
   ☐ More satisfactory — 23)____
   ☐ About the same
   ☐ Less satisfactory
   ☐ Much less satisfactory

8. Do you consider that any other system of farm record keeping that you know about would be as satisfactory for YOUR needs as TELFARM?

☐ Probably so 24) _____
☐ Perhaps
☐ Probably not

9. If you think about HOW you have used the TELFARM reports, we'd like to know how much you have used it for:

(a) DECIDING WHICH COURSE OF ACTION WOULD BE BEST.

☐ Haven't used it for this 25) _____
☐ Used it a little for this
☐ Used it a good deal for this

(b) FINDING WHAT KIND OF PROBLEMS I HAVE, WHAT KINDS OF THINGS I SHOULD LOOK INTO.

☐ Haven't used it for this
☐ Used it a little for this 26) _____
☐ Use it a good deal for this

(c) HOW WELL I'M DOING.

☐ Haven't used it for this
☐ Use it a little for this 27) _____
☐ Use it a good deal for this

10. Considering the TELFARM reports which you receive, tell us how much use each of the following has been to you. (check once on each line)

		Amount of Use			
		Very Little	Moderate	A Great Deal	
(a)	Tax	_____	_____	_____	28) _____
(b)	Income & expense, detailed	_____	_____	_____	29) _____
(c)	Income & expense, summary	_____	_____	_____	30) _____
(d)	Annual business analysis	_____	_____	_____	31) _____
(e)	Enterprise reports (optional)	_____	_____	_____	32) _____

11. Since Jan. 1, 1965, about how many times have you discussed your farm analysis (using TELFARM) with each of the following people?

		Number of times	
(a)	TELFARM district farm management agent	_____	33) _____
(b)	County extension agent or director	_____	34) _____
(c)	Vocational agriculture teacher	_____	35) _____
(d)	Local banker	_____	36) _____
(e)	F. H. A. representative	_____	37) _____
(f)	P. C. A. representative	_____	38) _____

12. Since Jan. 1, 1965, about how many meetings have you attended where TELFARM was an important part of the program.

Number of meetings_____ 39,40)_____

13. Now, thinking about the time you have spent either alone or with your family going over the reports which you have received from TELFARM center, could you please give an estimate of the number of hours spent since January 1, 1965?

Number of hours_____ 41,42)_____

14. How easy or difficult are the TELFARM reports for you to interpret?

☐ Very difficult
☐ Quite difficult
☐ Quite easy
☐ Very easy

43)_____

15. To use the TELFARM reports most effectively, do you think you need more training or help than you have now?

☐ Yes, a great deal more
☐ Yes, a little more
☐ No, I can manage now

44)_____

16. Here are some critical comments on the TELFARM reports. Please be frank, and tell us whether YOU agree or disagree with each statement.

DRAW A CIRCLE AROUND THE ANSWER WHICH BEST REPRESENTS YOUR OPINION.

-SA- strongly agree | -A- agree | -U- uncertain or undecided | -D- disagree | -SD- strongly disagree

(a)	I don't have the time to understand them.	SA	A	U	D	SD	45)	_____
(b)	I'm not interested in the amount of detail in them.	SA	A	U	D	SD	46)	_____
(c)	It's difficult for me to figure out the way the reports are organized.	SA	A	U	D	SD	47)	_____
(d)	I don't know how to pick out the important figures for my farm operation.	SA	A	U	D	SD	48)	_____
(e)	I need more help to cope with the reports.	SA	A	U	D	SD	49)	_____
(f)	If I'd had more schooling perhaps I could understand those reports better.	SA	A	U	D	SD	50)	_____
(g)	It's difficult to find the figures I'm looking for.	SA	A	U	D	SD	51)	_____

Here and on the following page are two lists of statements that describe uses farmers have made of farm records.

READ THROUGH ALL OF THIS FIRST LIST. Then, choose the use from this list that has been most important for YOUR FARM BUSINESS. Put its number in the top box. Then choose the next two uses which are next in importance to you. Put these numbers in the next two boxes.

Now reverse - Choose the use that has been least important for your farm business. This number goes in the bottom box. Then, choose the next two uses which would be next to the least important. Now put the four numbers left over in the middle row of boxes.

Uses of Farm Records

1. Calculating rent or partnership settlements.
2. Recognizing family living costs.
3. Keeping cash transactions and depreciation information for tax purposes.
4. Calculating costs and returns from an enterprise.
5. Identifying profit or loss on farm business.
6. Identifying and measuring changes in net worth.
7. Keeping labor records for social security purposes.
8. Keeping track of what you owe and what people owe you.
9. Comparing your results with farms of similar size and type.
10. Helping obtain credit.

☐ MOST important for my farm Business

☐ ☐ ☐ ☐

☐ LEAST important for my farm business

14)_____
15)_____
16)_____
17)_____
18)_____
19)_____
20)_____
21)_____
22)_____
23)_____

Does each box have a number?

Again now, READ THROUGH ALL OF THIS SECOND LIST. Then, choose the use from this list that has been most important for YOUR FARM BUSINESS. Put its number in the top box. Then choose the next two uses which are next in importance to you. Put these numbers in the next two boxes.

Now reverse - Choose the use that has been least important for your farm business. This number goes in the bottom box. Then, choose the next two uses which would be next to the least important and place these numbers in the boxes just above the least important use. The four remaining numbers go in the middle row of boxes as before.

Uses of Farm Records

1. Deciding whether to buy more land.
2. Deciding whether to buy more machinery.
3. Deciding how to improve a farm enterprise.
4. Planning family living expenditures.
5. Planning next year's farm financial needs.
6. Predicting effects an expansion plan will have on income, net worth and debt payments.
7. Planning next year's crop and livestock programs.
8. Deciding whether to continue farming.
9. Identifying the results of different cropping and feeding practices.
10. Planning how to minimize income taxes.

MOST important for my farm business

LEAST important for my farm

24) _____
25) _____
26) _____
27) _____
28) _____
29) _____
30) _____
31) _____
32) _____
33) _____

Does each box have a number?

Some changes have been made in TELFARM and there is a possibility of more changes.

(check once for each question)

1. How do you feel about the NUMBER of changes which have been made in the reports you SEND TO the TELFARM center.

   ☐ Far too many
   ☐ More than I'd like
   ☐ Don't care
   ☐ Should be more

   34) _____

2. How do you feel about the NUMBER of changes and additions which have been made in the reports you RECEIVE FROM the TELFARM center.

   ☐ Far too many
   ☐ More than I'd like
   ☐ Don't care
   ☐ Should be more

   35) _____

3. Would you like to receive quarterly summaries of the dollars you took in and the dollars you spent during the PAST QUARTER and have this compared with the SAME QUARTER of the PREVIOUS year?

   ☐ Would be very useful
   ☐ Might be useful
   ☐ Don't know
   ☐ Not much interested in this

   36) _____

4. Pennsylvania provides a SPECIAL ANALYSIS service on a fee basis to members planning MAJOR CHANGES in their farm operation.

   For example, this change could involve a new enterprise. Your individual farm records along with predicted prices and other data are used to analyze and predict effects on income, costs, debts and debt repayment, and other important factors.

   How would you feel about having this type of service available to you?

   ☐ Almost certainly I would be interested
   ☐ Perhaps I would be interested
   ☐ I don't think I would be interested

   37) _____

We want you to think about the degree of accuracy wanted and the difficulties you have in collecting some kinds of information used in TELFARM.

1. What is the DEGREE OF ACCURACY you would like to shoot for when you collect these kinds of information?

   a. CROP PRODUCTION data reported annually on form 10. 38)_____

      ☐ Within 1%
      ☐ Within 5%
      ☐ Within 15%

   b. Home-raised FEED FED to LIVESTOCK reported monthly on form 2.

      ☐ Within 1% 39)_____
      ☐ Within 5%
      ☐ Within 15%

   c. OPERATOR and FAMILY LABOR reported monthly on form 3.

      ☐ Within 1% 40)_____
      ☐ Within 5%
      ☐ Within 15%

   d. Year-end INVENTORY of FEED and CROP supplies.

      ☐ Within 1% 41)_____
      ☐ Within 5%
      ☐ Within 15%

2. How difficult is it for you to be as accurate AS YOU WOULD LIKE TO BE when collecting these kinds of information?

   a. CROP PRODUCTION data reported annually on form 10.

      ☐ Very difficult 42)_____
      ☐ Quite difficult
      ☐ Not much trouble

   b. Home-raised FEED FED to LIVESTOCK reported monthly on form 2.

      ☐ Very difficult
      ☐ Quite difficult 43)_____
      ☐ Not much trouble

   c. OPERATOR and FAMILY LABOR reported monthly on form 3.

      ☐ Very difficult 44)_____
      ☐ Quite difficult
      ☐ Not much trouble

   d. Year-end INVENTORY of FEED and CROP supplies.

      ☐ Very difficult 45)_____
      ☐ Quite difficult
      ☐ Not much trouble

Here are some of the kinds of information you sent to TELFARM and uses of this information. The descriptions of both the reported information and uses are very short ones. When you answer these questions, will you think about ALL OF THE USES to which you have put each kind of information.

1. The table on which you report MONTHLY LABOR is used to measure labor efficiency. How worthwhile is this to you?

   ☐ Very worthwhile 46)_____
   ☐ Fairly worthwhile
   ☐ Worth very little

2. The FARM MAP on which you annually report acres, yields, ownership and soil data is used to verify production and keep a record of cropping practices. How worthwhile is this to you?

   ☐ Very worthwhile 47)_____
   ☐ Fairly worthwhile
   ☐ Worth very little

3. The CREDIT INFORMATION you report is used to calculate quarterly credit summaries of loan and loan payments and for net worth statements.

   (a) Do you report farm credit information?

   ☐ No 48)_____
   ☐ Yes

   (b) If yes, how worthwhile are the credit summaries?

   ☐ Very worthwhile 49)_____
   ☐ Fairly worthwhile
   ☐ Worth very little

4. ENTERPRISE ANALYSIS summaries are calculated if you report enough information.

   (a) Have you received any enterprise summaries?

   ☐ No 50)_____
   ☐ Yes

   (b) If yes, how worthwhile are they to you?

   ☐ Very worthwhile
   ☐ Would be more worthwhile if complete 51)_____
   ☐ Hasn't been worthwhile

   (c) Are you going to try to keep any enterprise records next year?

   ☐ Yes 52)_____
   ☐ No
   ☐ Haven't decided yet

5. Here are some statements which farmers have made about TELFARM. You will probably agree with some, and disagree with others. We would like to know how YOU feel about each of these statements.

DRAW A CIRCLE AROUND THE ANSWER WHICH BEST REPRESENTS YOUR OPINION.

-SA- strongly agree -A- agree -U- undecided or uncertain -D- disagree -SD- strongly disagree

(a) My county Extension agent (or director) has given me a lot more help since I joined TELFARM. SA A U D SD 53)_____

(b) The tax savings alone can justify my belonging to TELFARM. SA A U D SD 54)_____

(c) I have felt closer to the University since I joined. SA A U D SD 55)_____

(d) I get too much paper back from TELFARM, there just isn't time to look through it all. SA A U D SD 56)_____

(e) The most up-to-date farmers I know have joined TELFARM. SA A U D SD 57)_____

(f) The TELFARM reports aren't worth as much to me as the management help which I get from other people because I joined. SA A U D SD 58)_____

(g) I'm not so sure that it was worth it last year, but I expect to get more out of it in the future. SA A U D SD 59)_____

6. Who collects and records each of the following kinds of records YOU SEND TO the TELFARM center?

(a) Day to day financial entries on form 2. 60)_____
Husband__, Wife__, Both__, Other__

(b) Capital transactions on form 3. 61)_____
Husband__, Wife__, Both__, Other__

(c) Livestock information on form 3. 62)_____
Husband__, Wife__, Both__, Other__

(d) Labor records on form 3. 63)____
Husband__, Wife__, Both__, Other__

(e) Crop records on forms 2 and 10. 64)_____
Husband__, Wife__, Both__, Other__

7. a. On the whole do you feel that the reports that YOU RECEIVE FROM the TELFARM center have been:

☐ Very accurate
☐ Quite accurate
☐ Quite inaccurate

61) _____

b. If you have found mistakes, have they been:

☐ Mainly errors in reporting
☐ Mainly errors made by the computer center
☐ Some of each

62) _____

8. If you thought about the biggest ADVANTAGE of TELFARM to you, what would you say it was?

Biggest advantage_____

_____ 63,64) _____

_____

_____

_____

_____

9. If you thought about the biggest DISADVANTAGE of TELFARM, what would you say it was?

Biggest disadvantage_____

_____ 65,66) _____

_____

_____

_____

_____

10. If you could make one CHANGE in the TELFARM program, what would it be?

The change I'd most like to see made_____ 67,68) _____

_____

_____

_____

_____

_____

APPENDIX B

Personal Interviews With Selected Telfarm Cooperators

APPENDIX B

PERSONAL INTERVIEWS WITH SELECTED TELFARM COOPERATORS

Purpose of Personal Interviews

The purpose of the personal interviews which were conducted with selected farmers was twofold: first, to see whether the face-to-face interviews would provide validation of the data gathered in the written questionnaires, and secondly, to see whether the additional data gathered would suggest either alternate hypothese to those tested in the main body of the study, or additional hypotheses for future study.

Selection of Telfarm Cooperators for Personal Interviews

The State of Michigan was divided into seven districts for administrative purposes by the supervisors of the Telfarm Program. A full-time District Farm Management Agent was located in each area to aid the Telfarm cooperators. The area selected for further study was District 6, located in the South-Central area of the State, and closest to Michigan State University in order to minimize

interviewing costs.[1] The farmers who were selected for the additional personal interviews had received total unaided use scores on the written questionnaire which fell either in the top 23 percent or in the bottom 22 percent. This procedure was designed to maximize the differences related to high and low use of the Telfarm reports.

Interviewing Procedure Used with Selected Cooperators

Farmers located in District 6 who were selected for the personal interviews were listed by name and address only. The author conducted all the interviews personally. She did not review any of the written questionnaire material or any of the Telfarm records prior to the interview. The scale scores received by the respondents were reviewed after the notes on the interviews were written up.

The interviews were focused[2], and thus had certain distinctive characteristics. All of the interviewees

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[1] It had been established earlier that there was no significant difference in the amount of unaided use made of Telfarm by cooperators between the districts.

[2] The interviews were conducted within the framework and approach outlined by Merton, Fisk, and Kendall in their book The Focused Interview.

had participated in the Telfarm Program during the prior year. The author had analyzed the situation regarding the use of the Program, and tentatively developed hypotheses regarding probable responses. The major area of inquiry was restricted to the areas covered in the written questionnaire plus any related material considered relevant by the interviewee. The interview focused on the farmers' subjective experiences in participating in the Telfarm Program, and particular care was taken to ascertain their definition of the situation.

The author introduced herself at the start of the interview as being from Michigan State University and being interested in their response to the Telfarm Program. The interview was started with a structured question on the respondents' prior bookkeeping experience. This was easy for the respondents to answer, and proved satisfactory to establish rapport. After this question the interviewer relied on unstructured questions whenever possible. Both the stimulus and response were free for the respondent to answer as he wished. Thus, farmers were asked "What is useful to you in the Telfarm Program?" In cases where material included in the written questionnaire was not covered in the conversations following the unstructured questions, additional semi-structured questions

were asked. These usually dealt with a structured stimulus, but a free response. Thus, a farmer was asked "How satisfied do you feel with the Telfarm Program?"

The interview was concluded when the author felt that the relevant views were thoroughly explored. The interviews ranged in length from 20 minutes to 2 hours. There were no refusals.

Supplementary Personal Interviews

The author interviewed the District Farm Management Agent who was responsible for the selected respondents. He was asked what he knew about the cooperators and how they used Telfarm. Since this agent was responsible for almost 300 cooperators, he was not able to provide much detail on the selected respondents' use and attitudes toward the Telfarm Program.

The County Agricultural Agent located in each of the respondent's districts was also interviewed, and asked to give his evaluation of the cooperators' farm management ability, contract with extension activities, and use and attitudes toward the Telfarm Program.

High Users

Farmer A

Farmer A runs a large-scale operation on 500 acres with about 150 dairy cows in a loose housing system, and owns an equal number of beef feeder cattle. He has four full-time hired hands, three of whom have been working for him for more than five years. He pays health insurance for his employees and is considering a retirement policy for them. He is 48 years old and had finished high school. His two older children are attending college, but he does not know or worry about whether any of the children would be interested in eventually operating the farm. His wife does not come from a farm background, and does not help with the farm bookkeeping.

Farmer A has been on the Mail-In Account System in past years, but had dropped this program in favor of a Farm-and-Ranch system of accounting, which he felt was more comprehensive. The Telfarm system is used a great deal in this man's operations. He said "Last year I used it to keep enterprise accounts for my cow and heifer herds, and in the future I intend to do more cost accounting." He had just returned from a tour of large

California dairy operations sponsored by the Farm Journal, and mentioned that he felt the California ranch operators were much more aware of costs and returns than Michigan operators. He is very satisfied with Telfarm, and feels that he has few problems understanding it. There is no doubt that his high unaided use score is generally correct. Farmer A also expresses his satisfaction with the Program, and feels that he could easily keep and understand the records.

Farmer A appears to have a high degree of economic orientation; he is continually expanding his operation and has large family expenses for university education. His scientific orientation also appears to be high, he makes direct trips to Michigan State and Purdue Universities when he wants specific questions answered. He would also rate high on an independence scale, other farmers look to him for advice, but he seems to make up his own mind after considering decision alternatives. These observations from the personal interview agree with Farmer A's scores on the three scales.

The County Agricultural Agent knows this farmer well, and says that he is an excellent cooperator with the Extension Service and holds responsible positions on many

county agricultural committees. Farmer A is an early adopter of any new agricultural techniques which suit his operation. Farmer A indicated to the interviewer two areas where he had adapted original buildings at a low cost to new uses, although he knew that they were not the most up-to-date designs. He said "It is not a herring-bone milking parlor, but it was inexpensive and works relatively well, and I couldn't justify the extra expense with present milk prices."

Farmer A feels that the County Agricultural Agent is quite competent to aid him with Telfarm. "A" felt that when he does not know the answer he can get it from Michigan State University. He knows many faculty members by name, and draws comparisons between Purdue University and Michigan State University. He subscribes to many farm publications, and is a high consumer of a-l farm-related communications. He knows the District Farm Management Agent, but prefers to deal with the County Agricultural Agent, due to a personality conflict with the former.

His suggestion for improving the Program was a visit from the County Agricultural Agent when the quarterly report arrives in order to discuss its findings. He hopes that the business analysis will not arrive late as it had

the first year of the Program, and expresses his concern with late reports. He is most pleased with the tax reporting aspects of Telfarm and feels that the year's costs for Telfarm are amply repaid by the benefits of the tax form alone.

Farmer B

Farmer B is young, in his early 30's, and lives next door to his father. He and his father are partners and jointly run a 200-acre operation. The farm acreage is entirely devoted to cash crops. They had formerly operated a Grade B dairy herd, but have recently dropped it due to labor demands and difficulty of upgrading it to a Grade A operation. Farmer B had completed high school. He works nights as a drill press operator in a large machine shop. "B" says that he intends to continue his off-farm work, and his father has just been "laid-off", but that he too usually works part-time. He is interested in mathematics and enjoys keeping and working with the accounts.

Farmer B had kept a Farm Account Book supplied by his local bank prior to joining Telfarm. His father is not interested in records and left that aspect of the farm business to him. "B" said that he uses the Telfarm records

a lot, and gave evidence that he has conducted some quite sophisticated analysis on returns with different fertilizer rates. However, with a cash crop operation he does not need to refer frequently to his records. There are areas where the accounts could be of more use; for example, he is not aware of the way to keep records on his machinery so as to make calculations on cost of repairs, and thus to make decisions on timing of machinery or equipment replacements. He says that he is very satisfied with the Telfarm Program; the couple of questions he has had on bookkeeping procedures had been answered immediately by the County Agricultural Agent.

Farmer B seems to be relatively highly economically-oriented; he holds down two jobs on a year-round basis. He suggested indirectly that he is saving money in order to invest in buildings and equipment when he takes over the whole farm. At that time he will probably change it from a cash crop to a general or livestock operation. He rates in the middle range on scientific orientation; he applies scientific principles in areas where he is well informed. However, since he has low mass media consumption and low contact with other people involved

in agriculture, there are areas where he is not informed of recent farming developments. He would also rate about average in independence; he likes to figure out things for himself, but his father (who was a traditional farmer) really makes many of the decisions about the farm operation. Farmer B's questionnaire scores on the scientific orientation sclae and the independence scale falls in the mid-range. The economic orientation score falls in the low-high or high-medium group, which is somewhat less than might have been expected from the personal interview.

The County Agricultural Agent knows very little about this farmer. He says that "B" attends meetings whenever he can find time. Farmer B himself says that he does not often talk to other farmers, or have time to read much, and he does not appear to want much contact with persons other than his immediate family. The County Agricultural Agent is there if he has a problem, and "B" feels that the agent does a good job.

Farmer B feels that he has no suggestions on how the Telfarm Program might be improved, as he is happy with it at present. He enjoys sitting down by himself and puzzling out any aspects of his Telfarm returns that he does not understand immediately.

Farmer C

Farmer C operates a farm of about 200 acres, part of which he leases from his father. His father is in his 70's, has retired from a factory job and now helps on the farm. "C" had become interested in farming through a 4-H project in high school, he has gradually accumulated sufficient animals and machinery to run an intensive dairy operation. The dairy is currely being expanded from a 35 cow one-man operation to a 60 cow two-man operation. There are currently 46 milking Holsteins. "C" recently hired a full-time farm worker, and expresses some concern with the problems of keeping a hired hand satisfied.

Farmer C is in his early 30's and is a high school graduate. His wife also graduated from high school and takes an active part in the family decision-making. She keeps the books and does an excellent job of keeping them up-to-date and accurate. They have three children and plan to send them all to University. They feel that they will be able to manage since they live close to Michigan State University and the children can live at home.

"C" says that he makes a great deal of use of the Telfarm records. He says that he is in the process of expansion, and also continually making changes in his operations and that he must have records to help with the decisions. He cited as an example "I am just selling the last 12 steers, because I found that I was getting a higher return from the dairy." The farm reflected his philosophy of having as low a debt as possible. He makes maximum use of old barns, and has recently bought a second-hand silo for $70. He pointed to the tractor and said that he had bought it while he was in high school, services it well, and has it overhauled regularly.

Farmer C says that he tried to keep enterprise records on his steer and heifer herds the previous year, but since he was feeding them together, it became impossible to keep separate records. There is little doubt that this farmer does make a great deal of unaided use of his Telfarm reports. He expresses total satisfaction with the Program, and adds that he and his wife understand it well now and have no problems with their records.

"C" indicates a great desire to continually improve his profit situation, and his high economic motiviation

score appears to be correct. He expresses his interest in learning more about scientific agriculture. He is currently attending a short course on soils supervised by the County Agricultural Agent. He attends field days whenever possible. Farmer C knows several members of the Agricultural Economics Department by name, and consults them when he has a problem where he feels that they could assist with a particular decision. "C" also said that he reads several farm magazines and picks up any new bulletins when he visits the University. There seems to be little doubt of his desire to practice scientific agriculture, and this was also indicated with a high score on the scientific orientation scale.

Farmer C says that he does not belong to the Michigan Milk Producers Cooperative, because he feels that individual dairy farmers do not have sufficient say on how and where their milk will be sold. He adds "I am a strong believer in free enterprise." He scored high on the independence scale, ranking on the top 5 percent of the cooperators who responded to the written questionnaire.

Farmer C knows the County Agricultural Agent well and enjoys his help. The Agent also thinks highly of

this farmer, and adds that he was selected as an outstanding young farmer by the Lansing Junior Chamber of Commerce. The County Agricultural Agent says that he requires little help with Telfarm, and if "C" has a question, it can often be handled better by someone at Michigan State University. Farmer C does not know the District Farm Management Agent.

Farmer D

Farmer D is in his mid-forties and operates a dairy farm. He also takes care of his parents' farm which is adjacent to the home farm, giving him a total of 265 acres. "D" is a high school graduate, his oldest son teaches school, and his second son is at the University. The daughter is attending high school. His wife takes an active part in the farm operations. She is currently running a laying hen enterprise with 2,800 birds in batteries.

Farmer D has participated in the Mail-In Account System since he started farming. Both he and his wife feel strongly on the need for good records or accounts. He keeps the farm records, she participates in the family living section of the records. He says that he was extremely familiar with the old account system, the new one takes a while to learn, but now he is getting use to it. There

have been a few problems, but that on the whole he is satisfied with it. This was also indicated on his written questionnaire, where the score on the perplexity index was in the mid-range, but the satisfaction score was in the top third. He feels that the quarterly reports could be made easier to read.

"D" seems to be quite responsive in adjusting his farming operations to changing agricultural conditions. His dairy enterprise is at the size limit for a one-man operation, and he has an efficient cropping program. He lays stress on both to make the maximum profit on his farm. His scores on the economic motivation scale, independence scale and scientific orientation scale were all above average. Farmer D gives the impression that he is interested in modern farming methods, enjoys farming, but considers other activities are important. He now makes a good living but would not put in longer hours in order to make even more.

Farmer D is well-known to the County Agricultural Agent. The Agent considers him as an excellent participator in extension activities. "D" went on an extension-sponsored tour of Russian agriculture a short time ago.

The County Agricultural Agent says that he is an early adopter on many farm practices, and that other farmers in the area frequently look to him for advice.

Farm E

Farmer E is in his early fifties, and is a graduate of the Short Course in Agriculture at Michigan State University. He runs a 125 acre farm with two major enterprises, a turkey farm and a sheep herd. His children are active in 4-H Club work, and one daughter won a prize in a National Turkey competition.

"E" keeps the books himself. He joined the Telfarm Program because he was dissatisfied with the accounts which he had kept himself in prior years. He was quite dissatisfied with Telfarm the first year, and blames this on his lack of understanding of the record-keeping system, and also on the lateness of some of the reports. However, this year he says that things are going well, he is not making as many mistakes and the reports are coming on time. He indicates some degree of difficulty reading the quarterly reports, and would like to see the County Agricultural Agent more frequently in order to get help. He indicated both high satisfaction and high perplexity scores on the written reports.

Farmer E is quite ambitious financially, and indicates that he spends a good many hours using the Telfarm reocrds to investigate his financial position. He is currently recalculating his tax for the year using his third quarter report, and incorporating his turkey sales which were larger than expected. He had a high economic motivation score on the written questionnaire. His socres on the independence scale and the scientific orientation scale were both in the lowest quartile. "E" does indicate that he finds it difficult to keep up with the reading of farm magazines since there is too much farm work. However, he was also one of the first turkey farmers in the area to adopt white broad-breasted varieties, and he stays in close touch with the Poultry Science Department at Michigan State University. The scores on the written questionnaire on the independence scale and the scientific orientation scale were lower than would be expected from the personal interview.

The County Agricultural Agent knows this farmer, but not well. He lives closer to Michigan State University than to the Agent's office, and appears to have closer contact with the Poultry Science Department. Farmer E

has met the District Farm Management Agent once, has had no contact with the staff of the Telfarm Program, and gives the impression that he could use and would welcome a little more personal assistance.

Low Users

Farmer V

Farmer V is a bachelor in his early thirties who lives with his parents. His father has had a heart attack but still does many of the lighter chores on the farm. His mother does the bookkeeping for the Telfarm Program. Together they operate a 124 acre farm, with about 40 dairy cows. Farmer V has completed high school. He says that he had no prior accounting experience and does not understand much about it now. His mother had kept books before for tax purposes. She has some trouble keeping the accounts up-to-date and recording them in the correct categories.

Farmer V is embarassed by questions on how he uses the Telfarm accounts. He says that if he understood them better he might use them more. "Perhaps I should keep the books for a while instead of Mother, and then I might find out more about them," he says. He kept turning

the interview around to the usefulness of the Telfarm tax report. "V" says that he took the depreciation schedule and mailed it with his tax report, and that this saves a great deal of time.

"V" is aware that he has problems either using or understanding the Telfarm reports. He is inclined to blame his lack of record-keeping experience, and adds that Telfarm is difficult to understand. When he asked if he intended to take over the bookkeeping in the future, he says that there is too much hard work to be done on the farm to take time out for bookkeeping. Farmer V says that he is not dissatisfied with the Telfarm Program, and he is sure that he wants to stay a member of it as long as he keeps farming. He expresses some doubts whether he wants to spend all his life on the farm, that he feels his operation is not big enough and that he does not have sufficient capital. His score on the satisfaction index was at the median value. His perplexity score was low, since the written questionnaire had not been completed on all the questions related to the degree of difficulty experienced with the reports. His verbal responses indicate that he is having difficulty, and that he does not know how to use the reports. His sole use of the reports is for tax purposes.

Farmer V does not appear to have a high degree of economic motivation. His rationale for desiring to perhaps move off the farm was the lack of an optimistic future farm outlook, rather than the higher wages in off-farm employment, or the impossibility of adapting his farming operation to changing conditions and increasing his profit. His score on the independence scale was in the mid-range. He indicated that now he makes many of his own farm decisions since his father had the heart attack, however he emphasizes the value of hard physical work as opposed to bookkeeping. Farmer V had a low score on the scientific orientation scale, he indicates that he does not have time to keep up on his reading, or talk to the neighbors about farming, there is too much work to be done.

The County Agricultural Agent says that he encouraged Farmer V to join Telfarm because he had just started to do some farm management work with "V" prior to the Telfarm Program's inception. He feels that the farmer did not have sufficient records with which to make decisions. He agrees that Farmer V is making little use of the records except for income tax records.

Farmer V knows the County Agricultural Agent and says that he has seen him on several occasions. "But", V adds, "he's a busy man and doesn't have much time to spend with anyone." When asked if he feels that more help either from the County Agricultural Agent or the District Farm Management Agent would aid him in understanding the Telfarm reports, he said "Perhaps." He gives the impression that he knows he needs help, but does not want it. "V" could give no changes which he would like to see make in the program, and no indication of specific areas of difficulty.

Farmer W

Farmer W is a man in his mid-forties who operates a hundred acre farm. He has about 30 milking Holsteins. He finished high school himself, now his son is in high school and "W" commented that the son does not give him as much of a hand on the farm as he would like. "W" keeps the Telfarm accounts himself and apoligizes frequently for the fact that they are often late. "I don't like bookkeeping," he says quite frankly, "but I know it is important."

Farmer W says that he does not have too much trouble keeping the records. The problems which he initially encountered entering the records were taken care of by the County Agricultural Agent. However, with so much work to do on the farm, he finds it difficult to send reports in on time. He says that he spends very little time looking at the records, and says that the quarterly reports are difficult to understand. Then he adds, "But I support if I spent more time with them, I could figure them out." He does not seem to be fully aware of the uses of the reports, nor does he consider them when mentioning changes he could make in his farm operation.

He is not dissatisfied with the Telfarm Program, and he says that the tax report saved him some time last year. He recorded a low unaided use score for the Telfarm reports, and an aided use score in the median category. The latter answer was corroborated by the County Agricultural Agent who said that he had about the average amount of contact with extension. The perplexity score recorded by "W" on the written questionnaire was very high. He does not give the impression in conversation that he really has quite that amount of difficulty.

Farmer W had low scores on all three rational value orientation scales. He indicates little that would contradict these ratings. The farm is small, but he says nothing about buying more land, in spite of finding it necessary to buy feed for his dairy herd. He complains about after-school activities which keep his son from helping with chores. He indicates that farming involves long hard hours outside, and thinks that hours spent bookkeeping are hours subtracted from necessary chores. He reads some farm magazines, but brings up for discussion human interest stores on other farmers in the area, rather than suggestions for improving his farm operation.

Farmer X

Farmer X is in his late 50's and operates a large operation with his son. The farm totals about 400 acres in three locations. Farmer X and his wife now live in town, and the son and his family live in the farm home. The two main enterprises on the farm are feeder cattle and raising seed corn. Farmer X takes all the responsibility for the seed corn operation, and the son is responsible for the day-to-day supervision of the feeder cattle.

Farmer X keeps the books himself, and still retains most of the decision-making functions too. His daughter-in-law says that he brings the b-oks out to the farm about once a year to talk over the records with her husband. The son works nights in an industrial firm, and helps on the farm during the day. There is a full-time hired man. "X" is better educated than many farmers, has attended University, and his wife has been a school teacher for many years. He is known locally as the black sheep of a prominent Michigan farming family.

"X" indicates that he does not use the records a great deal except for tax purposes. His tax records are hard to work out, he says, as he inherited income from family land with producing oil wells. He indicates satisfaction with Telfarm, says that he has to keep books anyway for taxes, and may as well do it the right way. On the written questionnaire he indicated a high degree of difficulty with the reports. The interview would suggest that he has experienced some difficulty, but not as much as he indicated on the questionnaire.

The County Agricultural Agent indicates that he sees this farmer occasionally, that he comes in mainly to complain about some real or imagined injustice. Farmer X

rarely discusses farm management with the Agent. The County Agricultural Agent says that he had tried to persuade "X" for years to give up a beef cow herd on the grounds that it was uneconomic, but "X" had only done so recently. The Agent said that occasionally Farm X was an early adopter, he was the first in the area to grow hybrid seed corn. However, on his beef enterprise he rarely uses up-to-date practices.

Farmer X had median scores on the economic motivation scale and on the independence scale. Perhaps if he did not have a sizable off-farm income, he might try to maximize income more from the farm sources. The County Agricultural Agent says that he is a hard man to persuade, makes up his own mind, and is quite capable of making a fuss as he had done recently when his seed corn was not certified. The score on the scientific orientation scale was low, he indicates that he farms the way he wants to. The son is much more interested in up-to-date methods, re-ently attended a soils short course, but seems to have little influence on the farm management decisions.

Farmer Y

Farmer Y is in his late 50's, a bachelor who lives on the family farm with a married sister's family. He

is partially handicapped, and is no longer able to do heavy manual labor. He has sold the dairy herd within the past year, and has been looking for a job in the shop. He says that he cannot find a job as people have trouble with their insurance if they hire the physically handicapped. The farm is about 130 acres, much of it good land with well maintained buildings. "Y" was thinking about putting all of it in the Soil Bank.

"Y" says that he had been quite satisfied with the Telfarm Program, but it was a little difficult to figure out. He had used it the previous year, but now that he was going out of farming he does not need to do much with it. This would be the last year that he would subscribe to the Telfarm Program.

He knows the County Agricultural Agent and says that he didn't think much of Michigan State University's Extension Policy anymore. "They changed the agents around so much the farmers don't have time to get to know them." Farmer Y had very low scores on the economic motivation scale, the independence scale, and the scientific orientation scale. He gives the impression that he has given up on everything and just wants sufficient income to exist in his family home.

Farmer Z

Farmer Z is in his mid-thirties, did not finish his high-school education, and is currently operating almost 200 acres. Part of the farm is rented. He has only owned his present farm for two years, prior to that he owned 2 smaller farms. He has also only been farming full-time for two years. For sixteen years he earned his livelihood as a carpenter. "Z" still does odd jobs in the heighborhood as a carpenter, is currently donating his skills to build a church in the community. He is building up a dairy herd and has 27 cows milking.

Farmer Z joined Telfarm for the first time this year. He joined the program at the urging of a high-user who lives on an adjacent farm. He relies a good deal on the heighbors and on the County Agricultural Agent for help and advice when he has any problems. However, when he joined he brought a good set of records to the Agent's office, and he seems to have a few problems adjusting to the Telfarm system.

"Z" indicated that he had not used the records much when he returned the questionnaire. Since that time he has received his third-quarter report. He indicates that he

has been using it to compute his tax for the year, and finding that he would owe money, he has made the necessary feed purchases to reduce his tax to a nominal level. He is extremely satisfied with the Program and feels that it is very valuable for farm management purposes. Farmer Z had a high perplexity score on the written questionnaire, but it appears that those problems which he has with the program are graudally disappearing as he becomes more familiar with it. He is quite familiar with his records, and cited feed and fertilizer costs. He is currently keeping dairy records with the owner-sampler program, and stated that he expects to join the Dairy Herd Improvement Association as soon as his herd is sufficiently large to justify the increase in cost.

Farmer Z's scores on both the economic motivation scale and on the independence scale were in the mid-range. There was little reason to doubt that these were substantially correct. He seems to be quite ambitious for his sons and mentions how well they are doing at school. His score on the scientific orientation scale was high and this also seems correct from the interview. He showed several farm magazines, and gives every indication of being well-informed on recent developments in agriculture. He was attending a short course on soils, and adds that since he

is farming full time he has more time to attend farm meetings.

The County Agricultural Agent knows Farmer Z from recent contacts, and is quite impressed with his desire to learn. The Agent adds that he seems to be clever, and does a good job now of farm management. With his skills as a carpenter he has already made many improvements on both the farm and house.

Conclusions

The face-to-face interviews with Telfarm cooperators who are either high or low users of the reports appear to substantiate the findings of the written questionnaire. The unaided use scores of farmers are very similar to the answers which cooperators give in a personal interview. The concept of aided use presents some difficulty since the farmer may define the situation differently from the other participant in a discussion of Telfarm use. Thus the County Agricultural Agent may feel that a meeting is designed to discuss the place of records in farm management, the farmer may define the meeting differently.

The personal interviews seem to result in somewhat higher ratings of the degree of satisfaction with the Telfarm

Program. Farmers are reluctant to be perfectly candid and express their dissatisfaction, particularly when they feel that the Program is designed to aid them. When the participants indicate that they are not completely satisfied, the degree of difficulty experienced is apt to be cited as an excuse. When asked what is the cause of the difficulty, some farmers have trouble being specific. It might be helpful to obtain an empirical measure of the degree of difficulty experienced with coding and decoding some data from the reports.

The personal interviews seem to result in substantial agreement with the scores obtained by the farmers on the rational value orientation scales. Out of ten personal interviews there is only one case on each of the three scales, the economic motivation scale, the independence scale and the scientific orientation scale where the interviewer notes that a substantial degree of difference exists between the two methods of data collection.

Since the independence scale scores are not significantly related to the amount of unaided use given to the Telfarm Program, the interviewer was cognizant of looking for alternate explanations or hypotheses suggested by the lack of any relationship. There is some suggestion in

their personal interviews that the independence scale is not unidimensional. Some of the items in the scale deal with the extent of the farmer's referral to neighborhood norms. None of the farmers who were personally interviewed seem to be concerned with the approval of their neighbors. Other items on the independence scale deal with farmer's perception of independence in decision-making. Some of these statements reflect differences of opinion in the area of agricultural policy. The farmers who were personally interviewed differ greatly on this dimension, all the way from an approach identified with the Farm Bureau that all Government controls are undesirable, to an approach identified with the National Farmers Organization that farmers must bargain together to be effective. The differences of opinion on independence versus dependence in agricultural policy do not necessarily affect the viewpoint of the farmer on independence in decision-making on his own farm.

The scientific orientation scale is designed to measure the degree to which farmers are positive in their attitude toward science and the use of scientific farming methods. Scores on the scientific orientation scale are not significantly related to farmers' use of Telfarm. The personal

interviews suggest that an intervening variable measuring the degree to which farmers feel that changes are possible or desirable on their farm would have been appropriate. Many of the farmers who were personally interviewed have median or high values on the degree of scientific orientation. The farmers differ on the extent to which they are willing to make changes affecting their total farm operation, and this in turn affects the amount of unaided use they devote to Telfarm. Thus farmers with high scores on the scientific orientation scale do not necessarily apply the principles to more than the existing farm enterprises.

Five farmers who had indicated low unaided use of Telfarm were interviewed personally. Of these two have quite logical explanations which should have been treated in greater depth in the written questionnaire. One was leaving farming, and the other has only recently joined the program. There is every indication that the recent cooperator would more logically fall in the high unaided use category at a later date.