TYPES AND SOURCES OF INFORMATION USED BY FARMERS IN MICHIGAN, WITH IMPLICATIONS FOR EXTENSION PROGRAMMING

Thesis for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY

Russell G. Mawby

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This is to certify that the

thesis entitled

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Russell G. Mawby

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Lawrence Witt
Major professor

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by

Russell George Mawby

A THESIS

Submitted to the College of Advanced Graduate Studies of Michigan State University of Agriculture and Applied Science in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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The author bears full responsibility for the content of this thesis.

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Just as problems of farm management confront the farm operator, problems of program management concern those responsible for the operations of the Cooperative Extension Service. In best serving the information needs of its farmer clientele, knowledge of the patterns of information farmers consider important and information sources used by them can be helpful.

Data used in this study are from Stratum 4 (Michigan counties south of the Bay City-Muskegon line) of the Interstate Managerial Survey. This survey, which included a sample of 199 Southern Michigan farms, was conducted in the summer of 1954 by the Risk and Uncertainty Subcommittee of the North Central Farm Management Research Committee.

In response to a projective, non-structured question, respondents indicated that farmers should use different patterns of information in each of three situations:

a- when organizing a farm, a farmer should be most concerned with factors having long-term implications, such as production, institutional, and human factors.

b- in operating a farm for maximum profit, farmers should use most the types of information on production, prices, and new technology, each of which has certain possibilities of short-run flexibility in terms of the farm operation.

c- when operating a farm for the greatest family satisfaction, information on factors with long-term implications, including institutional, human, and production factors should be most used.

In terms of relative importance for their own operation and in light of their own experiences, respondents named production information most important, price next most, and institutional information least important. This pattern very nearly paralleled the pattern when "operating for profit" in the hypothetical situation, suggesting that the respondents were profit- and operationally-oriented.

In analyzing the patterns of use of eighteen communicative sources of information, different patterns were identified for each of five types of information: price, production, new technology, human factors, and institutional factors. In general, farmers look to a relatively small number of communicative sources for each type of information. And each source is looked to for more than one type of information.

Farmers in different positions relative to certain of the control variables employed different patterns of communicative sources when securing a given type of information. While data limitations did not permit exhaustive analysis of such relationships, reliable evidence was available for both price and production information source patterns. In general, variations in patterns of sources employed were associated with education, background experiences, personal situation, scale of operation, type of farm, and meeting attendance.

When farmers in different positions relative to control variables used a given source of information, they used it for essentially the same pattern of information.

These findings have implications for Extension programming. The different patterns of information which farmers indicate should be used

in organizational and operational situations should be recognized. If, as seems to be the case, agriculture is currently undergoing major organizational adjustments, recognition of such patterns is particularly appropriate. As a position of relative stability may be reached, a relative shift to operational patterns may be in order.

In general, Extension programming should recognize the sources most used by farmers for each of the types of information. Decisions regarding channels of information employed in Extension can in part determine the audience served. In turn, a decision regarding audience can be implemented in part through the employment of the sources of information to which that audience looks. If, as is apparently the trend, farm operations are becoming larger and more specialized, and farmers are securing more formal education, a challenge to Extension is suggested in that operators of such large specialized farms and farmers with more education looked to the land-grant system more than did other farmers.

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PREFACE

This study was completed as a part of the Interstate Managerial Survey of the Risk and Uncertainty Subcommittee of the North Central Farm Management Research Committee. As the Michigan Agricultural Experiment Station has participated in this interstate project and as the results reported here are appropriate for publication as an Experiment Station bulletin, this thesis has been written in a style and form making it readily adaptable to publication.

While this study was addressed essentially to information patterns of farmers and the sources of such information, the pertinence of these findings to dynamic economics should not be overlooked. In dynamic economic theory, the assumption of perfect knowledge is relaxed. The manager, usually operating in situations of imperfect knowledge, must make decisions related to organization and operation of the farm firm. An essential responsibility of the manager is that of learning, performing the functions of observation, analysis, and decision-making. As one reflects on the whole process by which the entrepreneur and/or society makes adjustments to change in situations of risk and uncertainty, one is aware of such conceptual considerations as liquidity preferences, propensities to consume and invest, the theory of the firm, and the situations related to different degrees of knowledge. In light of these, it is certainly appropriate to be concerned with the information patterns of farm managers and the sources of information employed as they perform their managerial functions. This study provides particular additional insight into the observation and analysis phase of the managerial process.

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Chapter I

INTRODUCTION

Just as problems of farm management confront the farm operator, problems of program management concern those responsible for the operations of the Cooperative Extension Service. With a responsibility for providing to its farmer clientele information useful in solving farm problems, the Extension Service must be concerned with the wisest utilization of its limited resources to that end.

Many factors must be considered in the program management decisions of Extension. This study will concern itself essentially with only two: the types of information considered important by farmers, and the communicative sources of such information.

It is apparent that, to be most effective in their efforts, the designers of Extension programs must be intimately aware of the types of information regarded as important by the farmers they serve. Certainly, if Extension is to be as helpful as possible in assisting farmers in making the managerial decisions they must make, an awareness of the types of information important to these decisions is essential.

Further, if the efforts of Extension are to be efficient, program developers must be cognizant of the sources of information being currently employed by farmers in securing the various types of information they need. With such knowledge, more effective decisions may be made in the planning of Extension programs.

While much research has been done in the broad areas of Extension communications, this analysis of data secured from Michigan farmers will probe somewhat different dimensions. First, it will address itself to an inspection of the types of information regarded as important by farmers in organizing farms and in operating farms for maximizing either profit or family satisfactions. Next, the communicative sources of information used by farmers in securing information will be reviewed. Then the analysis will relate both the types of information regarded as important and the sources of such information to various circumstances or characteristics of the farmers concerned, revealing whether farmers in different positions relative to the control variables indicate significantly different patterns and sources of information.

Finally, certain implications which the findings of this analysis may have for an Extension program will be cited. It should not be assumed that in and of itself the Extension Service should attempt or aspire to be the sole or even a major source of all types of information for farmers. Yet, in the management of their programs, Extension personnel should find it helpful to have an insight into the types of information regarded as important by farmers in making the decisions they must make, and an awareness of the communicative sources utilized by farmers in securing such information.

Chapter II

GENERAL PROCEDURE

Data used in this study are from the Interstate Managerial Survey.[1] A brief review of this survey will be useful in understanding the findings in this bulletin.

The Interstate Managerial Survey

The Interstate Managerial Survey is a cooperative, interdisciplinary regional study involving agricultural economists, statisticians and sociologists from seven states - Indiana, Iowa, Kansas, Kentucky, Michigan, North Dakota, and Ohio. The Risk and Uncertainty Subcommittee of the North Central Farm Management Research Committee served in establishing cooperative relationships. Under this Committee's guidance, the survey schedule was prepared and pretested, interviewer schools were conducted, the survey was completed, and analysis is being carried on.

The Interstate Managerial Survey is of considerable magnitude, with answers to 66 different questions covering many facets of decision-making and with 1075 schedules taken. Functionally, questions in the survey can be classified under these headings:

1. Types of information used by farmers in organizing and operating farms;
2. Analytical problems and processes in the management function;

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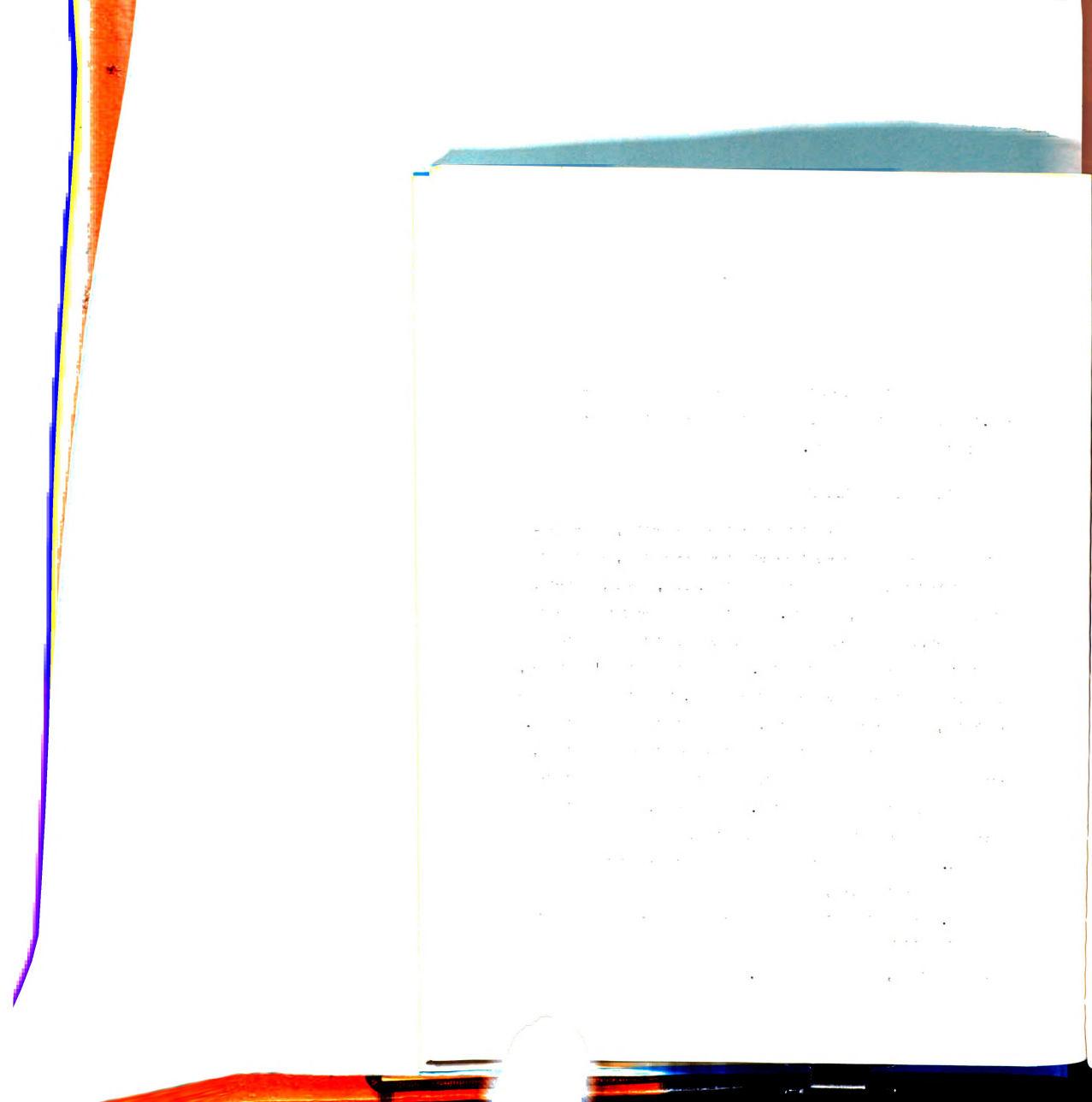
[1]For convenience, referred to as IMS.



3. Sources and means of securing information;
4. Expectation models;
5. Strategies;
6. Knowledge situations;
7. Propensities to buy insurance and to take risks as related to the disutility of losses and utility of gains in income and assets; and
8. Control questions.

The sample for the study was random with respect to sample segments in (1) the geographic area delimited within each state and (2) the entire geographic area delimited within the seven cooperating states.

The farmers sampled were those having primary entrepreneurial responsibilities for business units producing more than $2,500 worth of farm products, including the value of home consumption but excluding the rental value of farm buildings. Farmers with types of leases and partnership arrangements restricting their performance of the managerial functions were excluded. The sampling and other characteristics of the study are presented in Table 1.[2]

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[2]For more detailed information regarding the purposes and procedures of IMS, see G. L. Johnson, Methodology for Studying Decision Making, Journal of Farm Economics, Volume XXXIX, No. 5, December 1957; G. L. Johnson and C. B. Haver, Agricultural Information Patterns and Decision Making, Michigan State University Experiment Station, East Lansing, Bulletin Manuscript, 1959; and the series of articles on Progress and Problems in Decision Making Studies, Journal of Farm Economics, Volume XXXVII, No. 5, pp. 1097-1125, December 1955.

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Table 1

Sampling Characteristics and Interviews Taken, Interstate Managerial Survey, 1954

Stratum Number and State	Estimated Number of Eligible Farms	Estimated Number of Eligible Farms Per Sampling Unit	Expected Number of Farmers to be Interviewed	Sampling Rate	Actual Number of Farmers Interviewed
1. Kentucky	1,790	3	150	1/12	124
2. Ohio	23,599	2	200	1/118	137
3. Indiana	15,769	2	200	1/79	189
4. Michigan[1]	37,545	2	224	1/150	199
5. Michigan[2]	394	2	30	1/13	30
6. North Dakota	9,301	2	150	1/62	129
7. Iowa	23,649	2	140	1/169	120
8. Kansas	6,985	2	206	1/29	147

Data used in this analysis: This analysis utilizes data both for the total region and for farms in Michigan counties south of the Bay City-Muskegon Line. Since the analysis is directed to the Michigan situation and intended to be most useful in Michigan, the Stratum 4 data (Michigan counties south of the Bay City-Muskegon Line) are used most extensively.

[1]Counties south of Bay City-Muskegon line.

[2]Cheboygan and Presque Isle counties.

Table 1

Sampling Observation and Interviewing Rates,
Interstate Recreational Survey, 1959

Stratum Number and State	Estimated Number of Eligible Farms	Estimated Number of Eligible Farms Per Sampling Unit	Expected Number of Farmers to be Interviewed	Sampling Rate	Actual Number of Farmers Interviewed
1. Kentucky	1,750	3	150	1/12	154
2. Ohio	24,299	2	200	1/118	177
3. Indiana	15,159	2	200	1/79	189
4. Michigan	37,845	2	224	1/150	199
5. Michigan	394	2	30	1/12	30
6. North Dakota	3,301	2	120	1/62	128
7. Iowa	23,689	2	140	1/169	130
8. Kansas	6,985	2	206	1/29	147

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[1] Counties south of Bay City-Muskegon line.

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Further, only a portion of the total information secured in the IMS is utilized. Specifically, data are drawn from responses to questions in three categories:

1. Control questions: These questions deal with tenure status, size and type of farm, contacts with the Extension Service and farm organizations, background, education and vocational training, farm experience, non-farm employment, family responsibilities, employer status, income, assets, liabilities, and net worth. Answers to these questions are used in analyzing the inter-relationships between the position of a manager with respect to these factors and the types of information considered important and the sources of such information.[3]
2. Questions dealing with types of information used by farmers for organizing and operating farms.

   As reported by Johnson and Haver,[4] IMS indicated that the random sample of 1075 farmers in eight midwestern areas would have used proportionally different information patterns in organizing farms than when operating them to maximize either (a) profits or (b) satisfactions. Further, a ranking pattern of the importance of the various types of information

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[3]For convenience, the phrase "farmers of different characteristics" will be used when referring to those control variables.

[4]Johnson and Haver, Agricultural Information Patterns and Decision Making, Michigan Agricultural Experiment Station, East Lansing, Bulletin Manuscript, 1959.

was presented. In this study, a similar analysis is completed for the Michigan (Stratum 4) sample, and further analysis is made to determine if farmers of different characteristics would indicate different patterns of information in these situations.

3. Questions dealing with <u>communicative sources of information</u>. Analysis of these questions will indicate whether farmers use various communicative sources to different degrees in securing different types of information. The analysis is then further designed to reveal whether farmers of different characteristics:

   a. utilize different communicative sources in securing a given type of information, and/or

   b. secure different types of information from a given communicative source.

Chapter III

PATTERNS OF INFORMATION FARMERS INDICATE SHOULD BE USED

In their analysis of appropriate data from IMS, Johnson and Haver[5] reported that in 1954, a random sample of 1075 farmers in the eight midwestern areas of IMS would have required and used proportionally different information patterns when organizing farms than when operating them either to maximize (a) profits or (b) satisfactions.

While the types of information used by farmers had been classified into five categories (price, production, technological change, human, and institutional) prior to IMS,[6] these categories were not suggested to farmers at this point in the survey. Rather, the following open-ended, non-structured, projective-type questions were asked:

1. "What should a farmer find out before setting up a farm in a strange area for a strange family?"
2. "What kinds of information do you think a farmer ought to keep up with in order to operate a going farm business....
   a. "In order to get the greatest profit?"
   b. "In order to get the greatest satisfaction for his entire family?"

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[5] Ibid.

[6] G. L. Johnson and C. B. Haver, Decision Making Principles in Farm Management, Kentucky Agricultural Experiment Station, Lexington, Bulletin No. 593, January 1953.

In summarizing the responses to these questions, it became apparent that most of the responses could be grouped into the five recognized information categories: price, production, technological change, human, and institutional. Therefore, the usefulness of these categories is borne out.

It should be noted, however, that two additional categories became apparent from the survey. Home technology was frequently mentioned and could be suggested as a sixth category. To the extent that data are available, this category is used in this analysis. Further, information on how to analyze, decide, act, and bear responsibility was sometimes mentioned. However, because of the procedure employed, responses to this effect could not be expected in all instances where such a need might actually have been felt. Consequently, this category was only partially coded and cannot be used extensively in the analysis.

In this analysis therefore, the following broad classifications of the detailed component categories of information used by farm managers are employed:[7]

a. Price (information on prices of things bought and sold, including past prices and price trends; current prices and changes in prices; and price outlook).

b. Production Factors (information on existing varieties of crops and livestock; existing methods of producing crops and livestock; climate, soil and disease conditions).

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[7]See Figure 1 of Appendix I for summary of component categories included in broad types of information classifications.

c. New Technology (information on technological change - new inventions, developments and discoveries).

d. Human Factors (information about individuals you may have to deal with or consider in making decisions about a farm).

e. Institutional Factors (information on political, social, and religious factors).

f. Home Technology (information on existing and new technology related to the home).

In organizing a farm:

For the hypothetical situation, when organizing a farm, production information (yields, cropping practices, buildings, breeds, etc.) was the type most frequently mentioned by Michigan respondents. The next most mentioned category was institutional factors (schools, roads, churches, taxes, acreage allotments, markets, etc.). Information on human factors was third most mentioned, with information on prices, home technology, and new production technology following in that order (see Table II).

In operating a farm:

The information patterns Michigan farmers indicated should be used when operating a farm were quite different from the pattern of information which they said should be used for organizing a farm. Further, the pattern was different when the objective of operation was maximum profit than when maximum family satisfaction was the goal.

When operating for profit, information on production methods was still the most mentioned category, as it was when organizing a farm.

Table II

Number and Percent of Mentions of Farmers Mentioning at Least One Component[1] of Each of Six Major Information Categories, Michigan (Stratum 4 only).[2]

Type of Information	In Connection With								
	Organizing Farms			Operating Farms For					
				Profit			Family Satisfaction		
	No.	%	Rank	No.	%	Rank	No.	%	Rank
Price	12	5.7	4	107	29.3	2	20	12.2	4
Production	88	41.7	1	124	34.0	1	26	15.9	3
New Technology	2	.9	5	68	18.6	3	16	9.8	6
Human	43	20.4	3	15	4.1	5	42	25.6	2
Institutional	64	30.4	2	51	14.0	4	43	26.1	1
Home Technology	2	.9	5	0	0	6	17	10.4	5
Total	211	100.0	--	365	100.0	--	164	100.0	--

[1]For summary of component categories by broad types of information classifications, see Table 1 of the Appendix.

[2]Summarization by numbers of times components of each of the six major types of information were mentioned by farmers gives essentially the same patterns as reported on the basis of this classification.

Chi-square = 219.54, with 23.21 required for significance at the one percent level.

However, in operating for profit maximization, price information became the second most mentioned category, followed by information on new production technology and institutions. Human information and home technology ranked a poor fifth and sixth, respectively.

When operating to maximize family satisfactions, this pattern changed significantly. Information on institutional factors became the most mentioned category, followed by information on human factors. Information on production, prices, home technology, and new production technology followed in that order.[8]

From this it becomes apparent that, in general, farmers were more concerned with short-lived types of information in connection with operation, especially when for profit, than in organization of farms. Further, human and institutional information were emphasized more in connection with operating for greatest family satisfaction and in connection with farm organization.

Information Patterns Related to Control Variables:

While this summarization is useful and has implications for an Extension program,[9] further analysis relating responses to these questions to control variables (different characteristics of the respondents) provides additional insight, with possible implications also for Extension. For example, one might hypothesize that farmers of different ages or with varying degrees of formal educational experience would indicate different information patterns in these three situations (i.e. organizing

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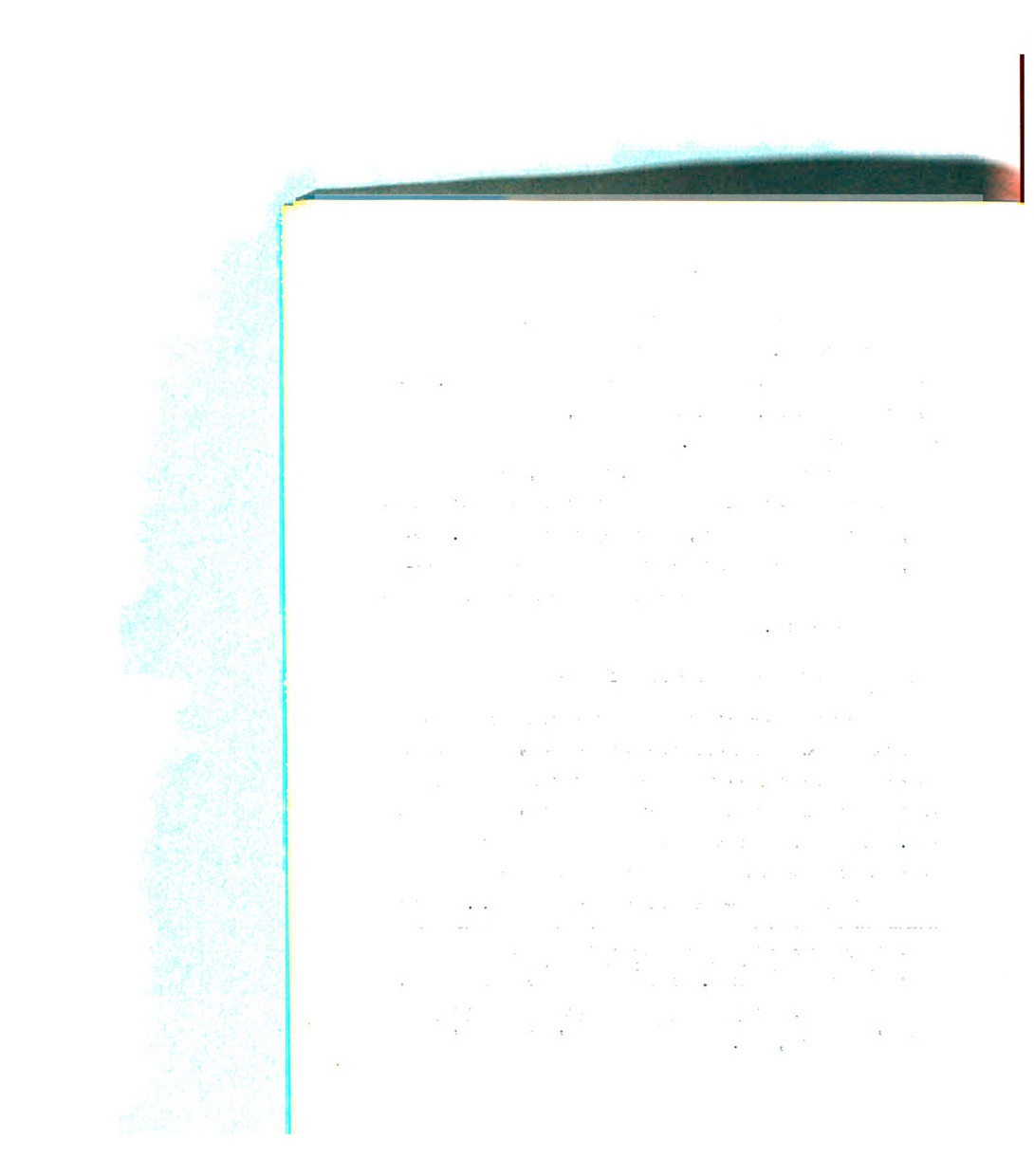
[8]Analysis by states indicated a significant difference between states in the information patterns in connection with operating farms to maximize family satisfactions. Michigan data only are presented here.

[9]Johnson and Haver, Agricultural Information Patterns and Decision Making, Michigan Agricultural Experiment Station, East Lansing, Bulletin Manuscript, 1959.



a farm, and operating either for maximum profit or for maximum family satisfaction).

For such an analysis, the control variables included in the survey schedule should first be reviewed.[10] Questions employed to secure this information dealt with background, education and vocational training, farm experience, non-farm employment, family responsibilities, size and type of farm, employer status, tenure status, assets, liabilities, and net worth, and contacts with the Extension Service and farm organizations. In addition, classifications of respondents on the basis of ranking of information considered important and on reasoning pattern was sometimes used. For convenience, each factor is described by a brief phrase which indicates something of the nature and situation of the respondent. In the analysis, each of these variables was related to the responses to the questions regarding types of information important in organizing farms and operating them for either maximum profit or satisfaction. The summary of this analysis is presented in Table 1 of Appendix II.

It is evident that, from this data, there is generally no relationship between the patterns of information thought important and the control variables. However, one should not be misled in this impression. For it appears that what in fact happened was this: each of the respondents, regardless of his situation with reference to the control variables, projected himself into the hypothetical situation which was created. Thus, he answered the question regarding types of information

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[10] The questions from which these control factors are derived are enumerated in Figure 2 of Appendix I, with tabulations of Michigan respondents.

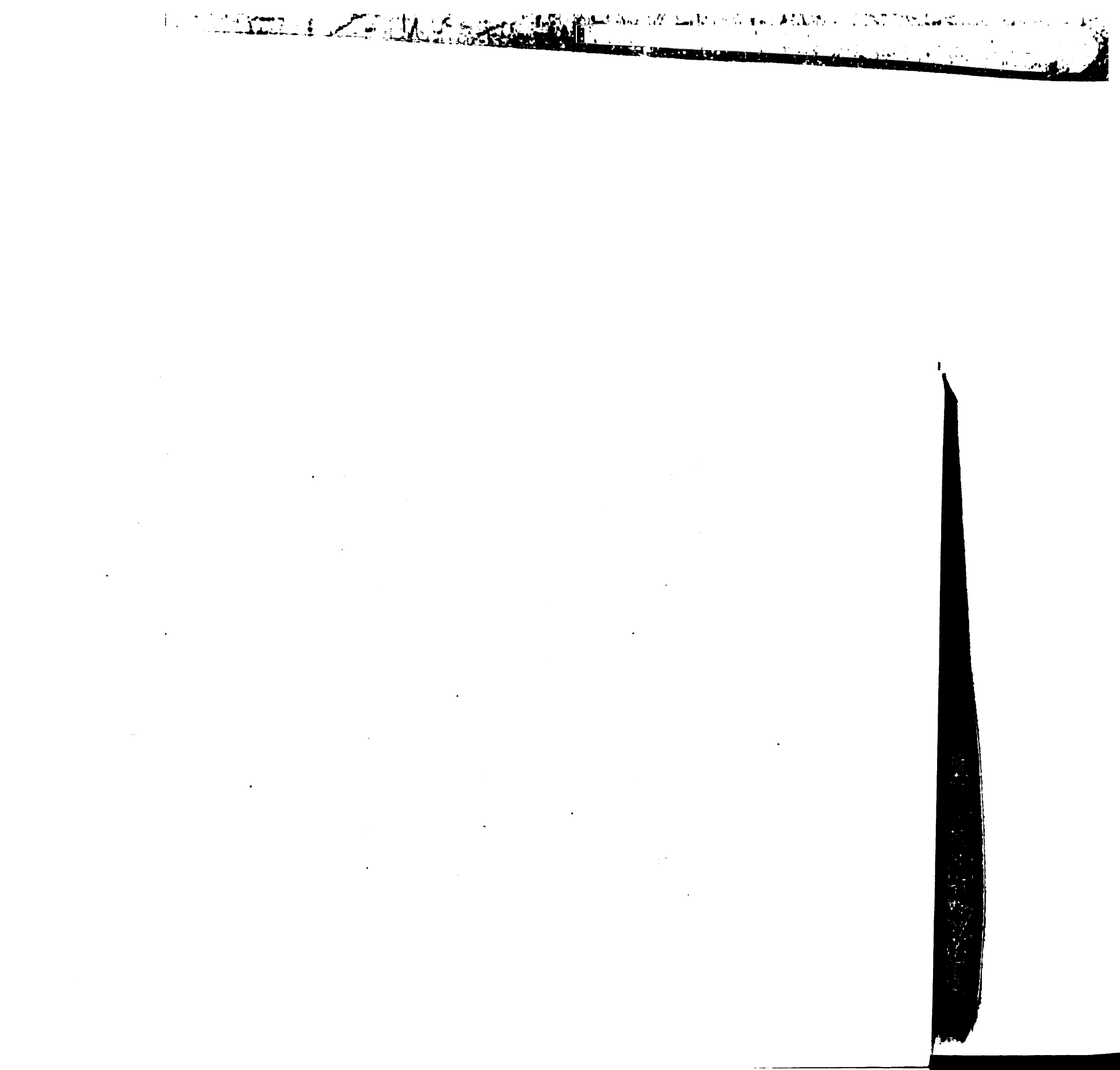
important in organizing a farm from the standpoint of doing so "in a strange area for a strange family."

Likewise, in responding to the questions related to types of information important in operating a farm for either maximum profit or satisfaction, the respondent "role-played" the two situations in answering, thus neutralizing any influence the circumstances or characteristics reflected by the control variable might have had.

These findings attest to the success of the projective technique employed in questioning. In answering the three questions, respondents projected themselves into the hypothetical situation, with the result that no relationship was evidenced between the information patterns and the control variables. Thus, the generality of these information patterns for the three situations is established.

Caution should be exercised in the interpretation of these findings with reference to the relationships of control variables and information patterns. If, for example, each farmer was indicating the pattern of information he himself would employ in organizing a farm, some difference between farmers of different characteristics might be evident. It would be erroneous to conclude from the evidence presented here that such would not be the case.

Further, the data should not be interpreted as indicating that respondents in different positions relative to the control variables are alike in their motivation in farm operation. The data indicate that, "if operating to maximize profits," the respondents of different characteristics would desire a similar pattern of information. "If operating



to maximize family satisfactions," they would desire a somewhat different pattern, but for all it would be similar. But no indication is given as to which of these situations a given respondent would choose. Thus, no conclusion can be reached from this data as to whether or not farmers of different characteristics do indeed operate with a different objective foremost in mind.

Rather, the information patterns outlined here are those which respondents indicated are generally appropriate for farmers to use when organizing a farm, or operating a farm for either profit or family satisfactions.

Chapter IV

RELATIVE IMPORTANCE OF TYPES OF INFORMATION FROM THE VIEWPOINT OF FARMERS

To determine the relative importance attached to each of the five types of information, each respondent was asked to rank the five types on the basis of their importance in setting up and running his own farm business. While the previous questions relating to types of information important in organizing and operating a farm had created a hypothetical situation in which the respondent could answer on the basis of "a strange family and a strange farm," the question related to ranks was phrased to be answered by the respondent for his personal circumstances.

Each respondent was introduced to the question of ranking the types of information by the preface: "Here is a list of five types of information which at one time or another you may have had to obtain in order to make decisions about things which have come up in the course of your farming career. Each type is explained in this list and if the explanation is not completely clear, I'll try to help you with it." The list (Figure 1) was then handed to the respondent, with a pause to allow time for reading and asking questions.

This listing represented the first time the respondent had been exposed to the five major information categories. Prior to this, as pointed out, non-structured questions had been used. As also noted, the coding of the answers to the non-structured questions revealed the general usefulness of the five information categories - price, production,

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Figure 1. Flash Card for Explaining Information Categories to Respondents.

1. PRICES: Information on prices received for farm products and prices paid for items used in farm production - this includes past, present, and future prices.

   Examples:

Current market prices	Feed and supply prices
Market outlook	Machinery prices
Corn-hog ratio	Wage rates
Dairy-feed ratio	Interest rates

2. PRODUCTION FACTORS: Information on the effects of all accepted farm practices and items used in production on rates of crop and livestock production - also, information on how soils, disease, and weather affect yields.

   Examples:

Fertilizers	Storage methods
Sprays and insects	Work methods
Crop varieties	Tillage practices
Feeding rates	Building layout

3. NEW DEVELOPMENTS: Information on new developments or changes in farm practices and items used in production.

   Examples:

Supplemental irrigation	Meat-type hogs
Antibiotics	New feed supplements
Anhydrous ammonia	Self-feeding silos
Chemical weed killers	Krilium

4. HUMAN FACTORS: Information about individuals you may have to deal with or consider in making decisions about a farm.

   Examples:

Family members	Dealers and buyers
Relatives	Salesmen
Neighbors or friends	County Agents
Other people	Hired workers

5. POLITICAL, SOCIAL, RELIGIOUS FACTORS: Information on local, national and international governments and formal and informal groups whose actions affect a farm.

   Examples:

Acreage controls	Church practices
Tax rates	Conservation programs
Draft	Drainage districts
School districts	Co-op policies

new technology, human, and institutional - if they are regarded as incomplete to the extent that they do not adequately differentiate between production and home technology and do not provide for inclusion of information on the managerial process itself. The use of this structured question involving the five major information categories seems therefore to have been reasonable.

After the respondent understood the listing of the five types of information, the interviewer asked, "In the light of your experience in getting information to set up and run your farm to get the most out of life, which of these five types of information have you found to be most important to you?" The answer to this question was recorded as Rank 1. The respondent was then asked, "Which of the remaining four has been most important to you?" This response was recorded as Rank 2. The respondent, with the list still before him, was then asked, "Which of the five has been least important to you?" This was Rank 5. The attempt to then secure Ranks 3 and 4 from the two remaining types was generally unsuccessful, with interviewers expressing doubts as to the reliability of these rankings. These last two were therefore not coded or tabulated.

In one-third of the schedules in states other than Iowa, and for all Iowa schedules, the words "for profit" were substituted for the phrase "to get the most out of life" in this question. Analysis for the region indicated however that no significant difference in the rankings resulted from these two wordings.[11] Therefore, no such distinction

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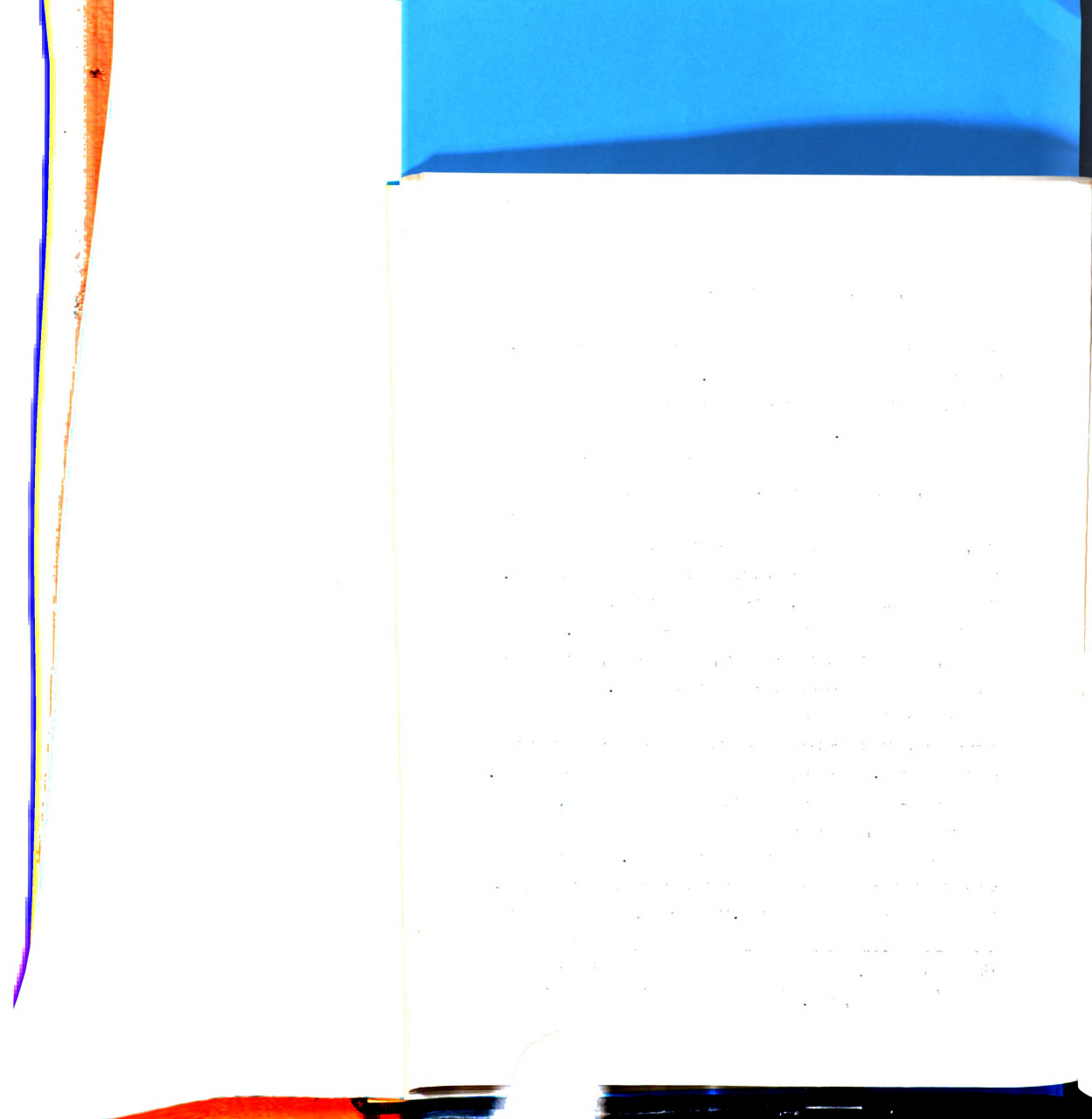
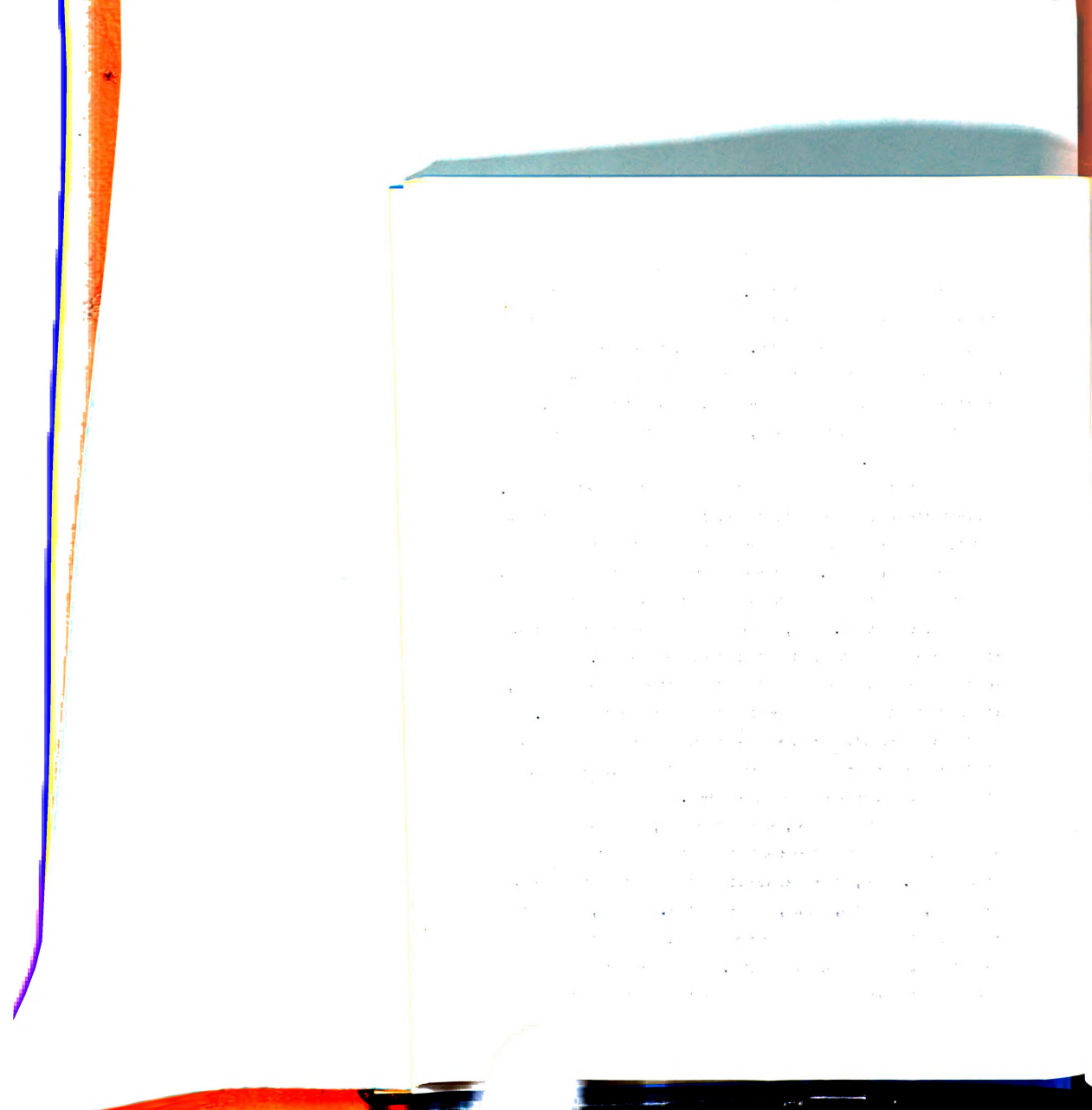
[11] Johnson and Haver, Agricultural Information Patterns and Decision Making, Michigan Agricultural Experiment Station, East Lansing, Bulletin Manuscript, 1959.



is made in the analysis for Michigan. One might expect a significantly different response to this question when phrased in terms "for profit" versus "to get the most out of life." In fact, it has already been noted that a different ranking was indicated in response to the non-structured questions for each of the three situations: 1) organizing a farm, 2) operating a farm for maximum profit, and 3) operating a farm for greatest family satisfaction.

Certain important differences in these questions should be noted. The projective question regarding information farmers should use in organizing and operating farms was answered on the basis of "a strange family and a strange farm." Each respondent was asked to respond separately to the question on operation on the basis first of profit and then of family satisfactions. Thus, he was made conscious of this distinction and was expected to provide distinct answers for each. And the questions were answered on the basis of information farmers should use, with no indication of the relative importance of the various types. Rankings were established on the basis of the numbers of farmers mentioning at least one component of each type of information category, with the most mentioned category ranked first.

In the ranking question, on the other hand, each respondent was asked to answer for himself on the basis of his own experiences and circumstances. Thus, his answer was likely influenced by his own circumstances, personality, values, and motivations. Further, he was given the opportunity to respond to only one question, phrased either "for profit" or "to get the most out of life." It is not unlikely that the respondents in fact answered then on the basis of their own circumstances



and convictions, not differentiating sharply between these two theoretical alternatives but responding in light of their own motivation. It is further reasonable that an individual operates his business not solely either "for profit" or "to get the most out of life," but rather for some combination of these two. Finally, the element of importance of the types of information was specified. While the ranking in the prior projective question reflected the frequency of use and yielded a different ranking pattern for each of the three situations, this question established the ranking pattern on the basis of importance of the information categories. The most used type of information is not necessarily the most important type of information, and the ranking pattern of importance when operating for profit was not different from the pattern when operating for family satisfactions, though such had been the case in the rankings on the basis of use.

Production information was most often mentioned as the most important type of information, with price information next most mentioned (Table III). Further, production information was also most often mentioned as the second most important type of information, with price second. It is obvious from this that production and price information were generally regarded by the Michigan respondents as the most important types.

On the other hand, information on institutional factors was most often mentioned as the least important, with information on human factors and new technology likewise indicated as relatively unimportant.

It is interesting to compare these rankings with those presented earlier. This ranking, on the basis of importance to the respondents

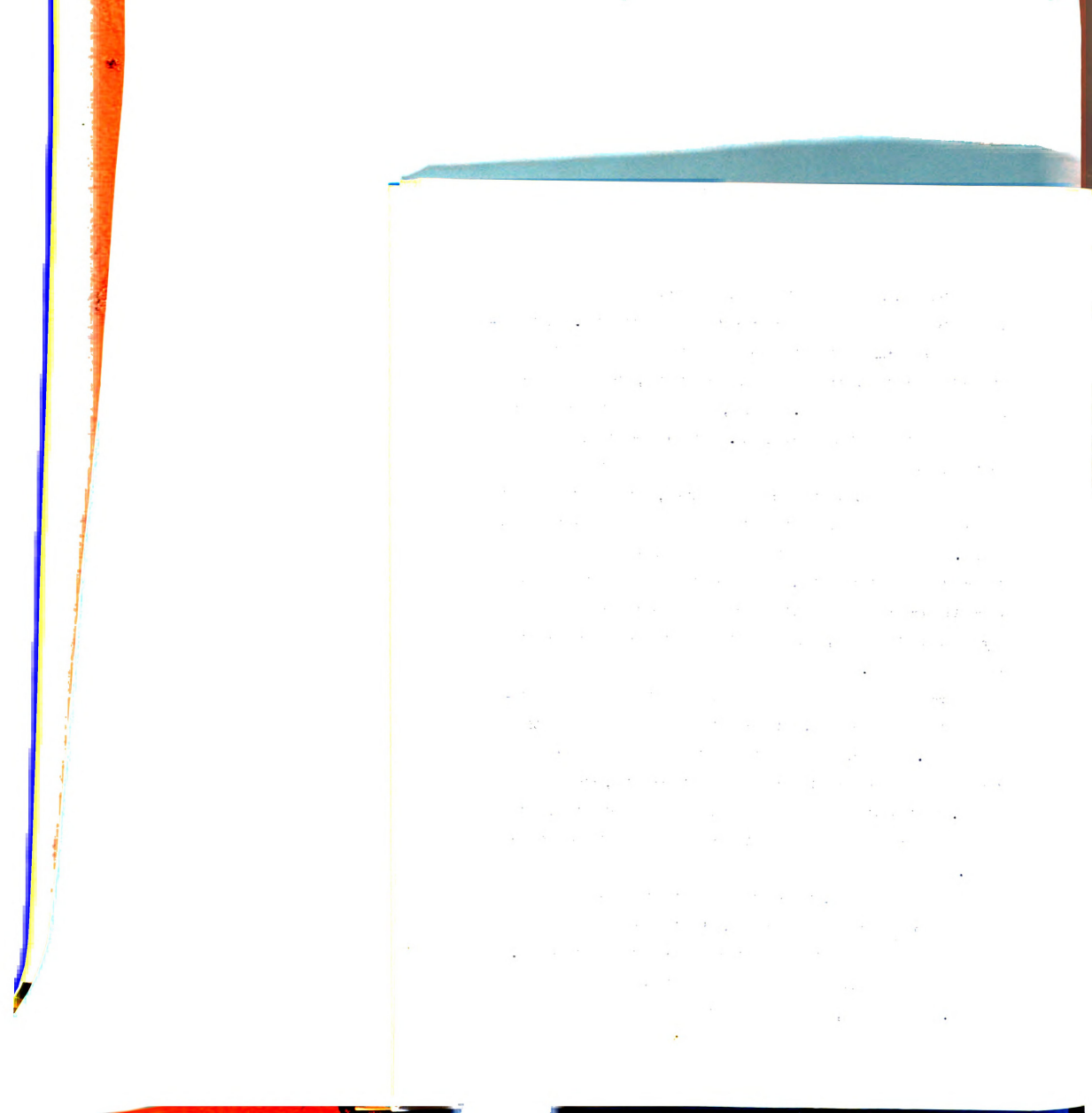
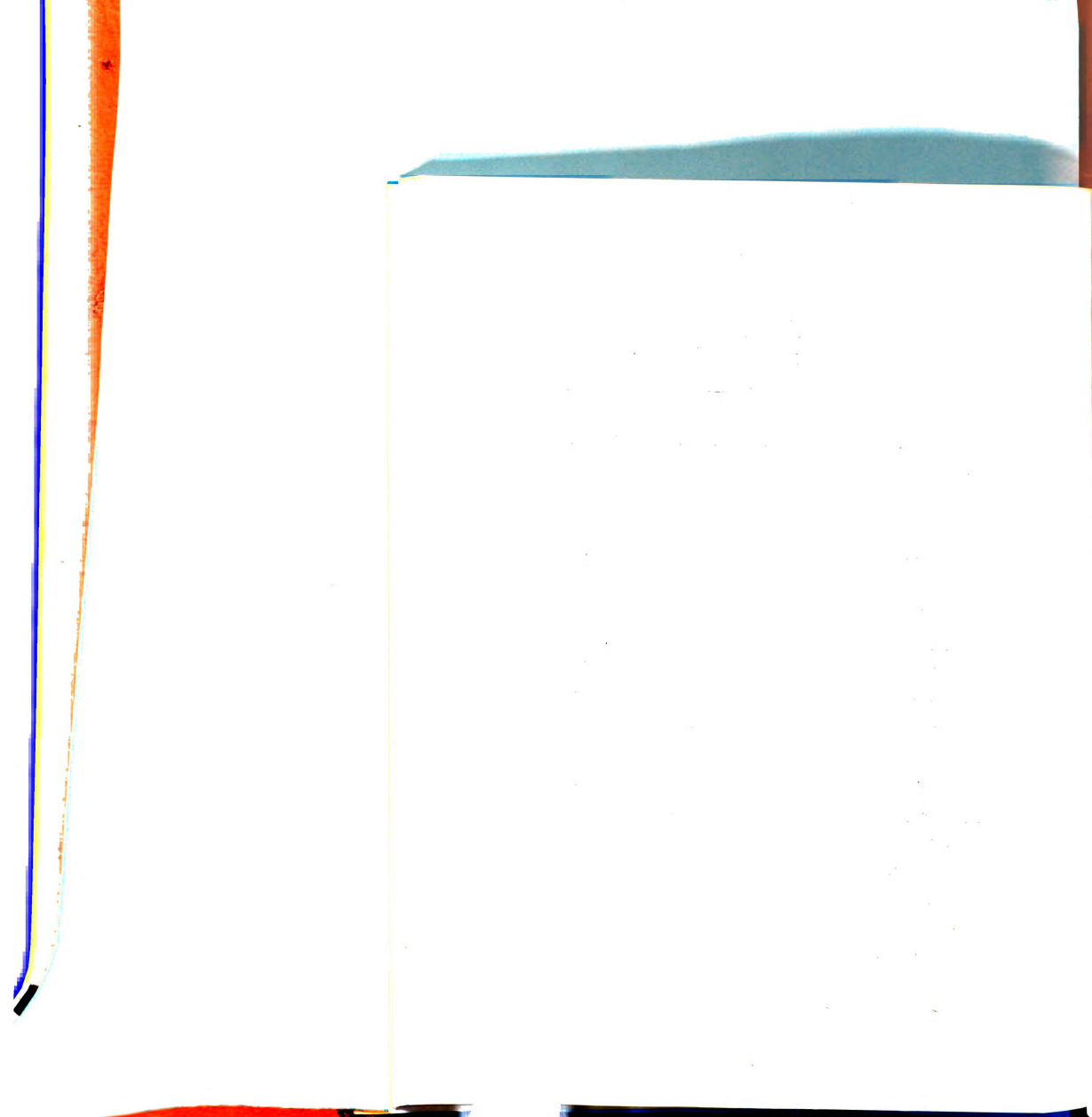


Table III

Number of Farmers Assigning Different Degrees of Relative Importance to Five Major Types of Information When Setting-up and Operating Farms, Michigan (Stratum 4 only)

Degree of Importance by Types of Information	Number of Respondents
Most Important	
Prices	68
Production	74
New Technology	17
Human	14
Institutional	6 / 179
Second Most Important	
Prices	44
Production	57
New Technology	29
Human	22
Institutional	21 / 173
Least Important	
Prices	8
Production	5
New Technology	43
Human	46
Institutional	53
All ranked equally	12 / 167



from his own experiences for his own farm, compares most nearly with that indicated, "a farmer ought to keep up with in order to operate a going farm business in order to get the greatest profit." The three rankings are summarized in Table IV.

Table IV

Comparison of Respondents' Rankings of Types of Information In Response to Different Questions Regarding Organizing and Operating Farms, Michigan (Stratum 4 only).

	Types of Information				
Question:	Price	Production	New Tech.	Human	Institutional
	Rankings				
1. "What should a farmer find out before setting up a farm in a strange area for a strange family?"[1]	4	1	5	3	2
2. "What kinds of information do you think a farmer ought to keep up with in order to operate a going farm business in order to get....					
a. "the greatest profit?"[1]	2	1	3	5	4
b. "the greatest satisfaction for his entire family?"[1]	4	3	5	2	1
3. "In the light of your experience in getting information to set up and run your farm to get the most out of life (alternatively, for profit), which of these types of information have you found to be most....next most.... least important to you?"[2]	2	1	3	4	5

[1]Ranking on the basis of number of farmers mentioning at least one component of each of the types of information categories (Rank 1 =

from his own experiences for his own farm, compares most nearly with that indicated, "a farmer ought to keep up with in order to operate a going farm business in order to get the greatest profit." The three ranking are summarized in Table IV.

Table IV

Comparison of Components' Rankings of Types of Information in Response to Different Questions Regarding Organizing and Operating Farms, Michigan (Status 5 only).

Question:	Type of Information				
	Production	Econ.	Human	Personal	
	Rankings				
1. "What should a farmer find out before setting up a farm in a strange area for a strange family"[1]	4	1	5	3	2
2. "What kinds of information do you think a farmer ought to keep up with in order to operate a going farm business in order to get...."					
a. "the greatest profit"	2	1	3	5	4
b. "the greatest satisfaction for his entire family"[1]	4	3	5	2	1
3. "In the light of your experience in getting information to set up and run your farm to get the most out of life (alternatively, for profit), which of these types of information have you found to be most....next most.... least important to you"[2]	2	1	3	4	5

[1] Ranking on the basis of number of farmers mentioning at least one component of each of the types of information categories (Rank 1 =

Rankings Related to Control Variables:

The rankings of the relative importance of the five types of information were next related to the control variables. The question: "do farmers in one position relative to a given control variable rank the types of information in a different pattern than farmers in a different position relative to that variable?"

In the analysis to determine such relationships, three requirements were established:

a - a chi-square significant at the .05 level;

b - no cell with an expected value of zero; and

c - not more than twenty percent of the cells with expected values of less than five.

While these requirements do not seem unreasonable, and in fact, seem quite minimum to any conclusion of significance, some difficulty was encountered because of small sample numbers. The results of this analysis are presented in Table 2 of Appendix II. While certain chi-squares are significant in relation to the degrees of freedom, most were not acceptable because of the number of cells with expected values less than five. In such cases, where appropriate on inspection, further tests were made after regrouping. However, in final analysis, no case of significant relationship was apparent.

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most number of farmers mentioning).

[2]Ranking as a composite of the information in Table III, with Production most mentioned as "most important," Price next most mentioned, Institutional Factors most mentioned as "least important," and the rankings for New Technology and Human Factors established by inspection.

It cannot be concluded from this with finality that there are no differences in the relative importance attached to the types of information by farmers in different positions relative to the control variable. Rather, it can only be said that these limited data provide no evidence of such differences.

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Chapter V

COMMUNICATIVE SOURCES OF INFORMATION USED BY FARMERS

A variety of sources are employed by farmers in securing information. Broadly, the many sources can be classified into two categories: non-communicative and communicative.

The non-communicative category would include such sources as past experience, trial and error on a whole operation, experimentation on a limited scale, observing the experiences of others, reasoning from information known to be true, and keeping written records. Such sources do not require that information pass from one person to another. A farmer can use a source of this nature of his own volition, without the cooperation of others.

Communicative sources on the other hand involve the transfer of information between people by some method and means. Eighteen such sources were included in the IMS survey schedule, from interpersonal contact through the mass media.

The importance of the non-communicative sources of information farmers employ in decision-making has long been recognized in Extension. Obvious examples of such recognition would include demonstration plots or fields, and farm account projects. Moreover, Extension personnel should be continuously aware of the importance of such sources and should not underestimate the implications of such in their work. However, Extension is essentially a communicative process even as it relates to the non-communicative sources, and this particular analysis is limited

to eighteen of the communicative sources of information employed by farmers.

It is interesting to note at this point that, in analyzing the data on sources of information, a significant difference exists between states as to the sources used for the various types of information. This difference between states is particularly important when considering the various sources employed for a given type of information, but relatively unimportant when considering the types of information secured from a given source. An important factor in the difference appears to be the availability of the various sources in each of the states. In light of this situation, it is particularly appropriate that the analysis here be confined largely to the state of Michigan (Stratum 4).

In securing the information regarding communicative sources of information, the interviewer asked, "with respect to communicative sources of information, would you please take this chart and check the appropriate spaces for the sources you usually use to get these different kinds of information?" The interviewer was instructed to then explain the various headings to the interviewee. The chart used in this procedure is presented in Figure 3 of Appendix I.

It should be noted that in particular the first eight columns refer to sources, with the channel of communication assumed to be conversation. These include people from farm organizations; county Extension agents, vocational agriculture teachers, and college of agriculture representatives; government people, truckers, custom operators, and route drivers; neighbors and relatives; professional farm managers; bankers and lending agents; and dealers, salesmen and buyers. The other

ten columns refer more nearly to channels of communication, for which the source of information may not be known by the interviewee. These include demonstrations, meetings, lectures; publications of experiment stations and Extension services; farm magazines; publications of farm organizations; formal schools; mail advertising; newspapers, radio; television; and auctions. In any instance, the ultimate or original source of information and the channel(s) by which it reached the farmer are not known. Only the sources from which the interviewee directly received the various types of information are recorded. This lack of detail through the communicative process is not a concern in this analysis, however, since no attempt is made to credit or discredit the various sources or to evaluate their effectiveness. Rather, the emphasis here is on the identification of the sources to which farmers look for the various types of information.

Information on the various sources used by Michigan farmers in securing the five types of information is summarized in Table V.

From the standpoint of farmer usage, the most important communicative sources are:

1 - for price information, dealers, salesmen and buyers first, with farm magazines and radio close behind.

2 - for information on production factors, county Extension agents, vocational agriculture teachers, and people from agricultural colleges most used, with farm magazines a close second;

3 - for information on new technology, farm magazines most used, with county agents, vo-ag teachers, and agricultural college representatives next;

Table V

Communicative Sources for Five Major Types of Information By Numbers of Farmers Reporting Use With Designated Percentage Distributions by Source and Type, Michigan, (Stratum 4 only)

Type of Information	People from Farm Organizations	Co. Agent, Voc. Agr. and Ag. College Representatives	Government People	Truckers, Custom Operators and Route Drivers	Neighbors and Relatives	Professional Farm Managers	Bankers and Lending Agents	Dealers, Salesmen & Buyers	Demonstrations, Meetings & Lectures	Public. of Experiment Station	Farm Magazines	Public. of Farm Organizations	Formal Schools	Mail Advertising	Newspapers	Radio	Television	Auctions	Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
Price	4	23	7	11	23	4	11	114	11	29	109	15	0	5	65	104	5	24	564
Production	1	83	11	0	33	5	0	14	21	36	78	5	2	6	25	34	5	2	361
New Technology	1	14	2	0	6	0	0	10	10	8	38	2	0	4	6	9	2	0	112
Human	5	8	9	11	50	2	26	16	1	1	2	2	0	1	1	2	0	1	138
Institutional	30	25	21	0	26	0	9	3	15	4	29	17	0	3	63	32	9	0	286
Total	41	153	50	22	138	11	46	157	58	78	256	41	2	19	160	181	21	27	1461
Percentages																			
Price	.7	4.1	1.2	2.0	4.1	.7	2.0	20.2	2.0	5.1	19.3	2.7	0	.9	11.5	18.4	.9	4.2	100
Production	.3	23.0	3.0	0	9.1	1.4	0	3.9	5.8	10.0	21.6	1.4	.5	1.7	6.9	9.4	1.4	.6	100
New Technology	.9	12.5	1.8	0	5.4	0	0	8.9	8.9	7.1	33.9	1.8	0	3.6	5.4	8.0	1.8	0	100
Human	3.6	5.8	6.5	8.0	36.2	1.5	18.8	11.6	.7	.7	1.5	1.5	0	.7	.7	1.5	0	.7	100
Institutional	10.5	8.8	7.3	0	9.1	0	3.4	1.1	5.2	1.4	10.1	5.9	0	1.1	22.0	11.2	3.1	0	100
Total	2.8	10.5	3.4	1.5	9.5	.8	3.1	10.7	4.0	5.4	17.5	2.8	.1	1.3	10.9	12.4	1.4	1.9	100 %
Price	9.8	15.0	14.0	50.0	16.7	36.4	23.9	72.6	19.0	37.2	42.6	36.5	0	26.3	40.6	57.4	23.8	88.9	
Production	2.4	54.3	22.0	0	23.9	45.4	0	8.9	36.2	46.1	30.5	12.2	100.0	31.5	15.6	18.8	23.8	7.4	
New Technology	2.4	9.2	4.0	0	4.4	0	0	6.4	17.2	10.3	14.8	4.9	0	21.1	3.8	5.0	9.5	0	
Human	12.2	5.2	18.0	50.0	36.2	18.2	56.5	10.2	1.7	1.3	.8	4.9	0	5.3	.6	1.1	0	3.7	
Institutional	73.2	16.3	42.0	0	18.8	0	19.6	1.9	25.9	5.1	11.3	41.5	0	15.8	39.4	17.7	42.9	0	
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

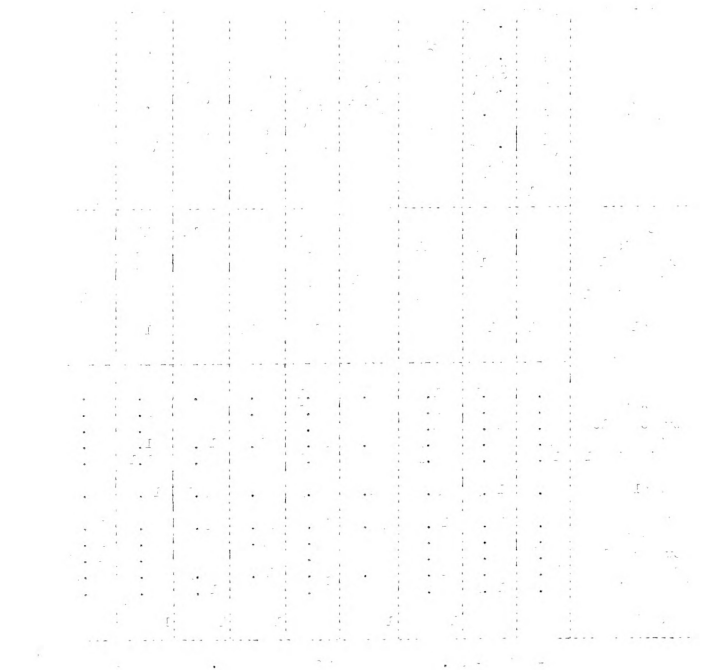
Chi-square 833.49 for 68 degrees of freedom. With 75 degrees of fredom 105.60 is significant at the one percent level.

cannot be negative

E (frequency) of cell must be > 5 in at least 80% of the cells with no cell $E_f < 1$ for χ^2 tests to be valid

29 cells have $E_f < 5$
$\frac{29}{68} = 32\%$
$\therefore \chi^2$ tests not valid

see p. 23



4 - for information on human factors, neighbors and relatives by far most used, with bankers and lending agents second.

5 - for institutional information, newspapers most used, with radio, people from farm organizations and farm magazines following.

Further useful observations can be made from this summary:

When considering the types of information:

1. the four or five most-mentioned sources accounted for about two-thirds of the "mentions" for each type of information. Thus, the importance of certain sources for each type of information is emphasized.
2. certain of the eighteen sources were very unimportant for a given type of information. This is not unexpected.
3. for no one type of information were all eighteen of these communicative sources mentioned.

When considering the sources of information:

1. twelve of the sources were indicated as a source for each of the five types of information.
2. only two of the sources were indicated for only one or two types of information.
3. for each source, its relative importance as a source for each of the five types of information is indicated.
4. certain sources (for example, formal schools and professional farm managers) were quite unimportant for any of the types of information.

From this data it is apparent that a) a different pattern of sources is employed by farmers in securing each of the five types of information; and b) each of these communicative sources is characterized by a different pattern insofar as the information secured from it is concerned. These relationships shall now be explored in further detail.

In line with our original intent to analyze the data in terms of the relative position of respondents with reference to various control variables, two questions present themselves at this point.

First, to secure a given type of information, do farmers of different characteristics look to different sources?

Second, from a given source of information, do farmers of different characteristics secure different types of information?

Different Sources for a Given Type of Information?

It has already been shown that the different communicative sources of information are used to differing degrees in securing the five types of information. Now the question, "do farmers of different characteristics (i.e. in different positions relative to the control variables) secure a given type of information from different sources?"

To determine the answer to this question, data on the sources of information used by Michigan (Stratum 4) farmers were analyzed with reference to each of the control variables. The summary of this analysis is presented in Table 3 of Appendix II.

The data were first tested for significance in their original form, employing eighteen communicative sources and the subgroupings established for each control variable. In determining the significance

of the relationship, three requirements were again established:

a. a chi-square significant at the .05 level,

b. no cell with an expected value of zero, and

c. not more than twenty percent of the cells with expected values less than 5.

Because of the limited numbers in the Michigan sample, even though 38 of the 160 tests yielded significant chi-squares, the results were not convincing because of the numbers of cells which were void or had low numbers. Therefore, the data were grouped and retested.

First, the eighteen communicative sources were grouped into eight categories, with attention given to the appropriateness of the combinations. The groupings, with new designations, are as follows:

A. Farm organizations:

people and publications of farm magazines.

B. Land-grant system:

county Extension agents, vocational agriculture teachers, and agricultural college representatives; demonstrations, meetings, lectures; publications of experiment stations and Extension services.

C. Commercial people:

truckers, custom operators, and route drivers; dealers, salesmen, and buyers; auctions.

D. Professional counselors:

government people; professional farm managers; bankers and lending agents.

E. Neighbors and relatives.

F. Farm magazines.

G. Newspapers (including mail advertising).

H. Radio and TV.

The sources of information, on the grouped basis, used for the five types of information are presented in Table VI. It should be noted that the relative positions of the more important sources for each type as observed in Table V have not been altered by the grouping process.

In addition to the grouping of the sources into only eight categories, where appropriate the sub-categories for the control variables were also grouped. The relationships were again tested, using the same conditions as already outlined. These data, too, are presented in Table 3 of Appendix II.

It is apparent from this analysis that, to some extent, there is a definite relationship between certain of the control variables and the sources employed in securing a given type of information. For these data, this relationship is most apparent in the price category and to a much lesser extent in production. No relationship was evidenced in the information categories of new technology, human factors, and institutional factors. This lack of significance should not be regarded as conclusive, however, for with the ungrouped data some evidence of relationship existed. Rather, the problem is one of insufficient data for reliable analysis.

Sources for Price Information:

There is strong evidence that farmers in different positions relative to certain of the control variables do look to different sources for price information. Specifically, a significant difference in sources

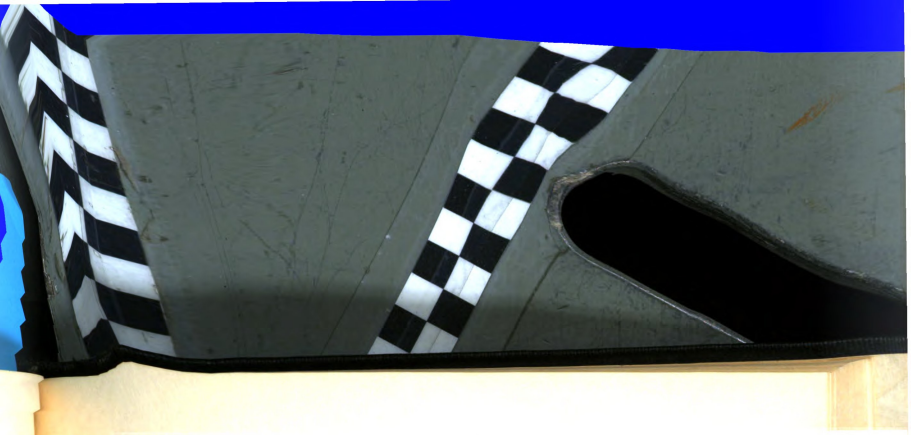
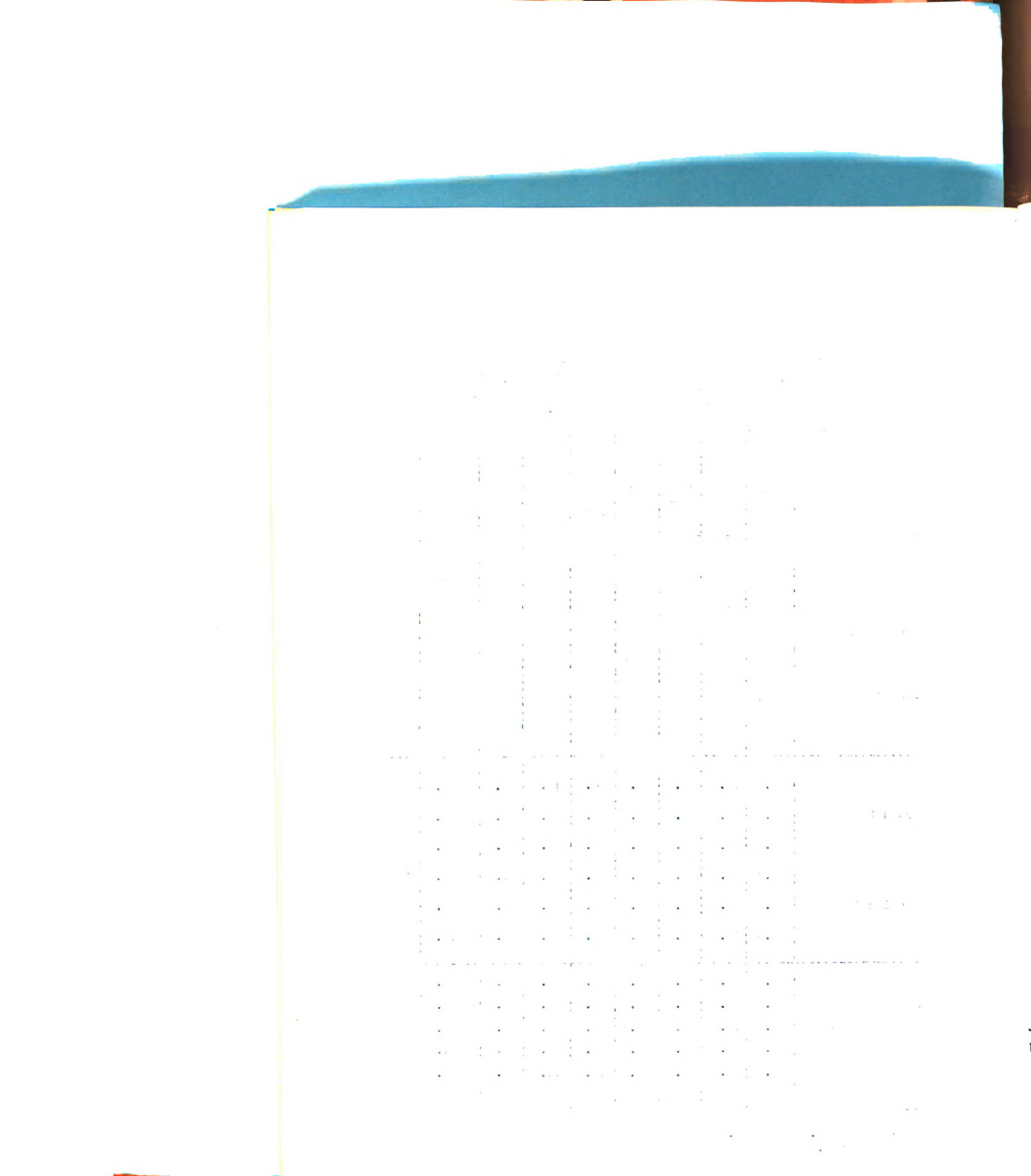


Table VI

Communicative Sources (Grouped Basis) for Five Major Types of Information, by Numbers of Farmers Reporting Use, with Designated Percentage Distribution by Source and Type, Michigan (Stratum 4 only).

Type of Information	Farm Organizations	Land-grant system	Commercial people	Professional counselors	Neighbors & relatives	Farm magazines	Newspapers	Radio and TV	Total
				Number					
Price	19	63	149	22	23	109	70	109	564
Production	6	140	16	16	33	78	31	39	359
New Technology	3	32	10	2	6	38	10	11	112
Human	7	10	28	37	50	2	2	2	138
Institutional	47	44	3	30	26	29	66	41	286
Total	82	289	206	107	138	256	179	202	1459
				Percentages					
Price	3.4	11.2	26.4	3.9	4.1	19.3	12.4	19.3	100
Production	1.7	39.0	4.5	4.5	9.2	21.7	8.6	10.8	100
New Technology	2.7	28.6	8.9	1.8	5.4	33.9	8.9	9.8	100
Human	5.1	7.3	20.3	26.8	36.3	1.4	1.4	1.4	100
Institutional	16.4	15.4	1.1	10.5	9.1	10.1	23.1	14.3	100
Total	5.6	19.8	14.1	7.3	9.5	17.5	12.3	13.9	100
				Percentages					
Price	23.2	21.8	72.3	20.6	16.7	42.6	39.1	54.0	
Production	7.3	48.4	7.8	15.0	23.9	30.5	17.3	19.3	
New Technology	3.7	11.1	4.8	1.8	4.4	14.8	5.6	5.4	
Human	8.5	3.5	13.6	34.6	36.2	.8	1.1	1.0	
Institutional	57.3	15.2	1.5	28.0	18.8	11.3	36.9	20.3	
Total	100	100	100	100	100	100	100	100	

Chi-square=652.50 with 48.28 required for significance at the one percent level.



of price information was found for sixteen of the control variables.

For convenience in analysis, these sixteen variables are grouped into six broad descriptive categories, as follows:

1. Education
   a. Agricultural training in formal schooling
   b. Last grade of school
   c. Additional training related to agriculture
2. Background
   a. 4-H or FFA member
   b. Children in 4-H or FFA[12]
   c. Experience out of farming
   d. Length of non-farm experience
3. Personal situation
   a. Age of respondent
   b. Stage of family cycle
   c. Number of dependents
4. Scale of operation
   a. Use of hired labor
   b. Average annual gross farm income
   c. Net worth
   d. Total acres tilled
5. Type of farm
6. Meeting attendance

[12]While the chi-square test indicated a significant relationship, no significant difference of source relative to this variable was identifiable with the t-test. Therefore, this variable is not included in the analysis which follows.

To determine the nature of the differences in sources of price information indicated by farmers in different positions relative to the above variables, detailed examination is now necessary. At this point, it seems appropriate to review earlier evidence that the more important sources of price information were indicated to be commercial people, followed by farm magazines, and radio and TV (Table V). Newspapers and the land-grant system followed about equally, with neighbors and relatives, professional counselors, and farm organizations relatively unimportant sources of price information.

To determine the significance of the difference of use of a given source by respondents in different positions relative to a given variable, a t-test was then applied. This analysis which is summarized in Table VII, is in relative terms, employing percentages of farmers in each position relative to a control variable who used each source of information.

The findings of this analysis may be verbalized as follows:

Education:

1. Those respondents who had agricultural training in their formal schooling used the land-grant system and professional counselors relatively more than those who had not had such training.
2. Respondents with less than 12 years of school used commercial people and radio and TV relatively more than those with 12 years or more of school.

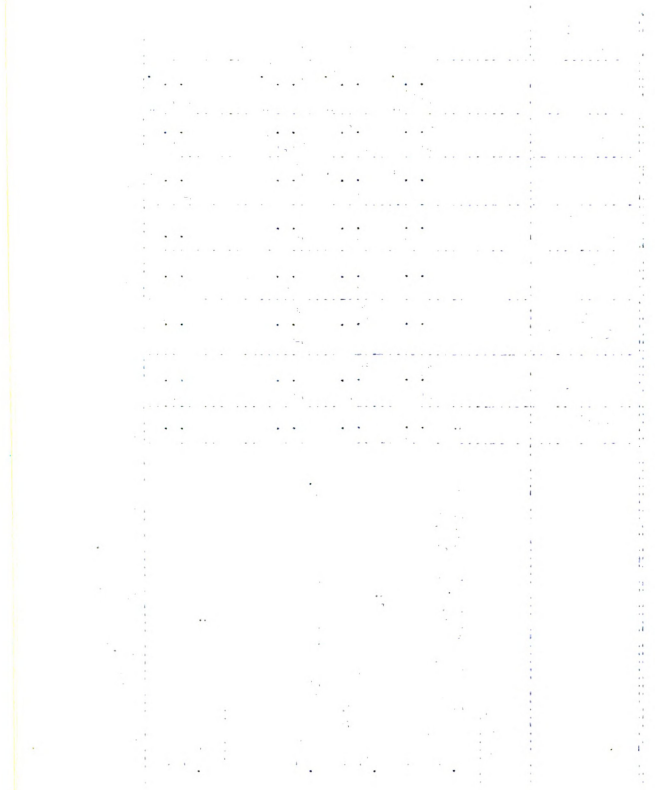
Table VII

Influence of Control Variables on Sources of Price Information Used by Farmers, Michigan (Stratum 4 only).[1]

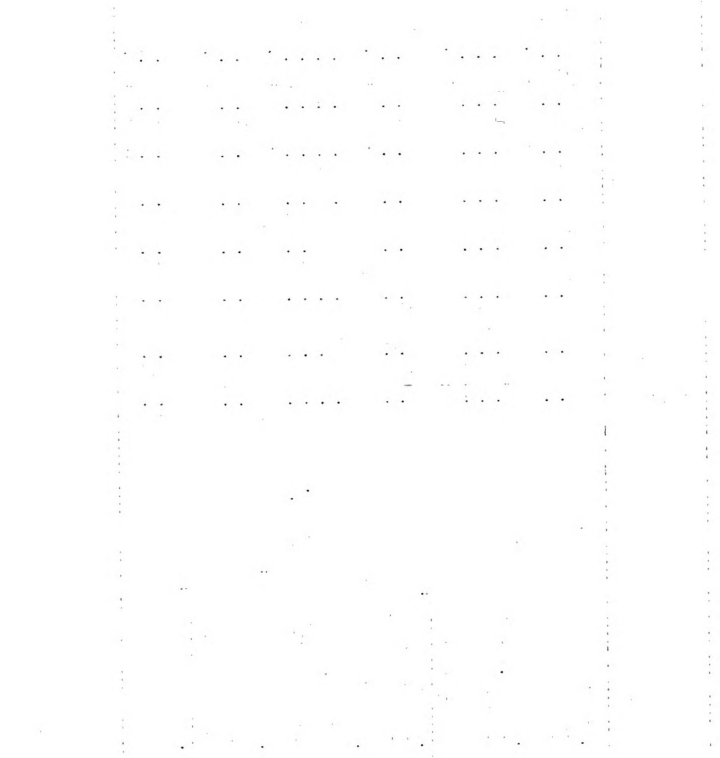
	Farm organizations	Land-grant system	Commercial people	Professional Counselors	Neighbors and relatives	Farm magazines	Newspapers	Radio and TV	Number of Mentions
	percentages								
Education									
a. Agricultural training in formal schooling:									
-in college &/or high school &/or grade school	2.0	16.3*	22.3	6.4*	5.4	19.3	12.4	15.9	202
-none	3.7	8.4	28.8	2.6	3.5	18.7	12.7	21.6	347
						Chi-square = 18.67			
b. Last grade of school:									
-less than 12	3.8	8.0*	29.1*	3.3	3.5	18.3	12.5	21.5*	399
-12 or more	2.4	18.8	20.0	5.5	5.5	21.8	12.1	13.9	165
						Chi-square = 23.17			
c. Additional training related to agr.									
-Yes	4.3	14.9	19.9*	2.5	1.9*	26.1*	14.3	16.1	161
-No	3.0	9.7	29.2	4.5	5.0	16.6	11.5	20.5	404
						Chi-square = 18.31			
Background									
a. 4-H or FFA member:									
-Yes	4.9	13.5	19.5*	5.9	4.9	19.5	14.0	17.8	185
-No	2.7	10.2	30.5	2.9	3.7	19.5	11.8	18.7	374
						Chi-square = 12.37			

[1] Detailed explanation of the questions providing these control variables can be found in Figure 2 of Appendix I.

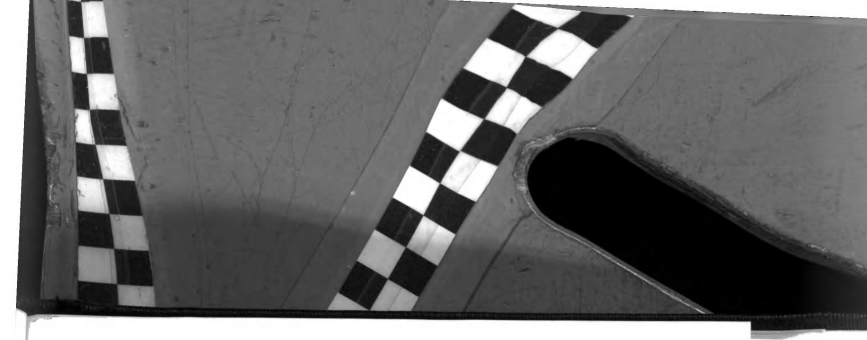
*Indicates significant t-test.



	Farm organizations	Land-grant system	Commercial People	Professional Counselors	Neighbors & Relatives	Farm magazines	Newspapers	radio and TV	Number of Mentions
b. Experience out of farming:									
-Yes	5.1	6.9*	32.4*	5.1*	5.6	16.2	11.6	17.1	216
-No	2.3	13.8	22.9	3.2	3.2	21.2	12.8	20.6	349
						Chi-square = 19.13			
c. If out of farming, how long?									
-Up to 6.9 years	5.6	5.6*	27.8*	4.4	6.7	16.6	10.0*	23.3*	90
-7 to 26 or more years	8.1	9.5	45.9	5.4	2.8	18.9	4.0	5.4	74
-None	2.3	13.7	22.9	3.2	3.2	21.2	12.9	20.6	349
						Chi-square = 40.29			
Personal situation									
a. Age of respondent:									
-Up to 35 years	2.6	19.3	21.9	2.6	4.4	15.8	16.7	16.7	114
-35 years and older	3.5	9.1	27.7	4.2	4.0	20.2	11.3	20.0	451
						Chi-square = 14.02			
b. Stage in family cycle:									
-Unmarried	1.7	0*	12.1	0	1.7	32.8*	13.8	37.9*	58
-Married, with no children	4.8	42.8	7.1	0	0	14.3	14.3	16.7	42
-Married, children under 18 yrs.	3.3	9.0	26.2	5.6	4.7	24.6	12.3	14.3	301
-Married, children over 18 yrs.	3.4	8.0	35.1	2.9	3.4	16.1	10.4	20.7	174
						Chi-square = 96.27			
c. Number of dependents:									
-None or one	4.1	10.4	23.2	2.3	2.3	20.0	12.3	25.4*	220
-Two or more	2.9	10.6	28.6	5.0	5.3	19.2	12.7	15.7	339
						Chi-square = 14.20			
Scale of Operation									
a. Use of hired labor:									
-None	3.3	6.2*	26.7	3.3	4.6	20.8	14.0	21.1	307
-Some	3.5	17.1	26.4	4.5	3.5	17.4	10.5	17.1	258
						Chi-square = 19.46			



	Farm Organizations	Land-grant system	Commercial People	Professional Counselors	Neighbors & relatives	Farm magazines	Newspapers	Radio and TV	Number of Mentions
b. Average annual gross farm income:									
-Under $4500	2.2	2.2*	31.3	1.1*	3.2	23.8	13.0	23.2*	185
-$4500 - 12,999	3.5	16.4	23.2	4.2	4.2	16.8	12.6	19.1	310
-$13,000 or more	7.1	10.7	28.6	8.9	5.4	23.2	10.7	5.4	56
						Chi-square		= 46.59	
C. Net worth:									
-Under $30,000	2.6	9.3	25.3	2.2	3.0	21.6	13.0	23.0*	269
-$30,000 and over	4.6	11.4	29.3	5.7	5.3	16.7	12.9	14.2	263
						Chi-square		= 16.01	
d. Total acres tilled:									
-Less than 90 acres	4.7	6.0*	25.5	4.2	5.7	21.4	12.0	19.7	192
-90 or more acres	1.7	14.3	26.6	4.0	3.4	19.3	12.3	18.4	349
						Chi-square		= 12.04	
Type of farm									
-Stock (dairy or fat stock)	4.7	11.1*	24.7	5.0*	3.6	21.5*	11.8	17.6	279
-Crop (field crop, vegetable or fruit)	1.9	16.1	26.7	4.3	5.6	14.3	13.1	18.0	161
-General	3.2	5.5	28.5	0	3.2	20.9	14.4	24.3	91
						Chi-square		= 19.11	
Meeting attendance									
-Yes	4.7*	16.1*	24.7	4.4	4.2	16.7*	13.6	15.6*	360
-No	1.0	2.4	29.8	2.9	3.9	23.9	10.2	25.9	205
						Chi-square		= 41.31	



3. Respondents who had 12 or more years of schooling used the land-grant system relatively more than those with less formal school experience.
4. Those respondents who had had additional training related to agriculture used farm magazines relatively more than those who had not, while those who had not had such additional training used commercial people and neighbors relatively more.

From the standpoint of sources:

1. The land-grant system was used relatively more by farmers who had had agricultural training in their formal schooling and by those who had completed 12 or more years of school.
2. Commercial people were named as a source relatively more by those respondents who had not completed high school and by those who had had no additional training related to agriculture.
3. Professional counselors were named relatively more by those who had had agricultural training in their formal schooling.
4. Neighbors and relatives were used relatively more by those who had no additional training.
5. Farm magazines were named relatively more by those who had additional training related to agriculture.
6. Radio and TV were used relatively more by those who had not completed high school.

Background

1. Respondents who had not been members of either 4-H or FFA used commercial persons as a source of price information to a greater

extent than did those who had been members.

2. Those respondents who had been out of farming for a period of time used commercial persons as a source relatively more, while persons who had not been out of farming named the land-grant system relatively more.
3. Those who had been out of farming for 7 years or more used commercial people relatively more than those who had not been out or who had been out less than 7 years.
4. Those who had been out of farming 7 years or more named newspapers and radio and TV relatively less.

From the standpoint of sources:

1. Commercial people were named relatively more by respondents who had not been members of 4-H or FFA and by those who had been out of farming for 7 years or more.
2. The land-grant system was named relatively more by persons who had never been out of farming.

Personal situation:

1. Respondents under 35 years of age indicated relatively greater use of the land-grant system.
2. Unmarried farmers indicated relatively greater use of farm magazines and radio and TV.
3. Married farmers with no children indicated significantly greater use of the land-grant system as a source than did either unmarried respondents or married respondents with children.

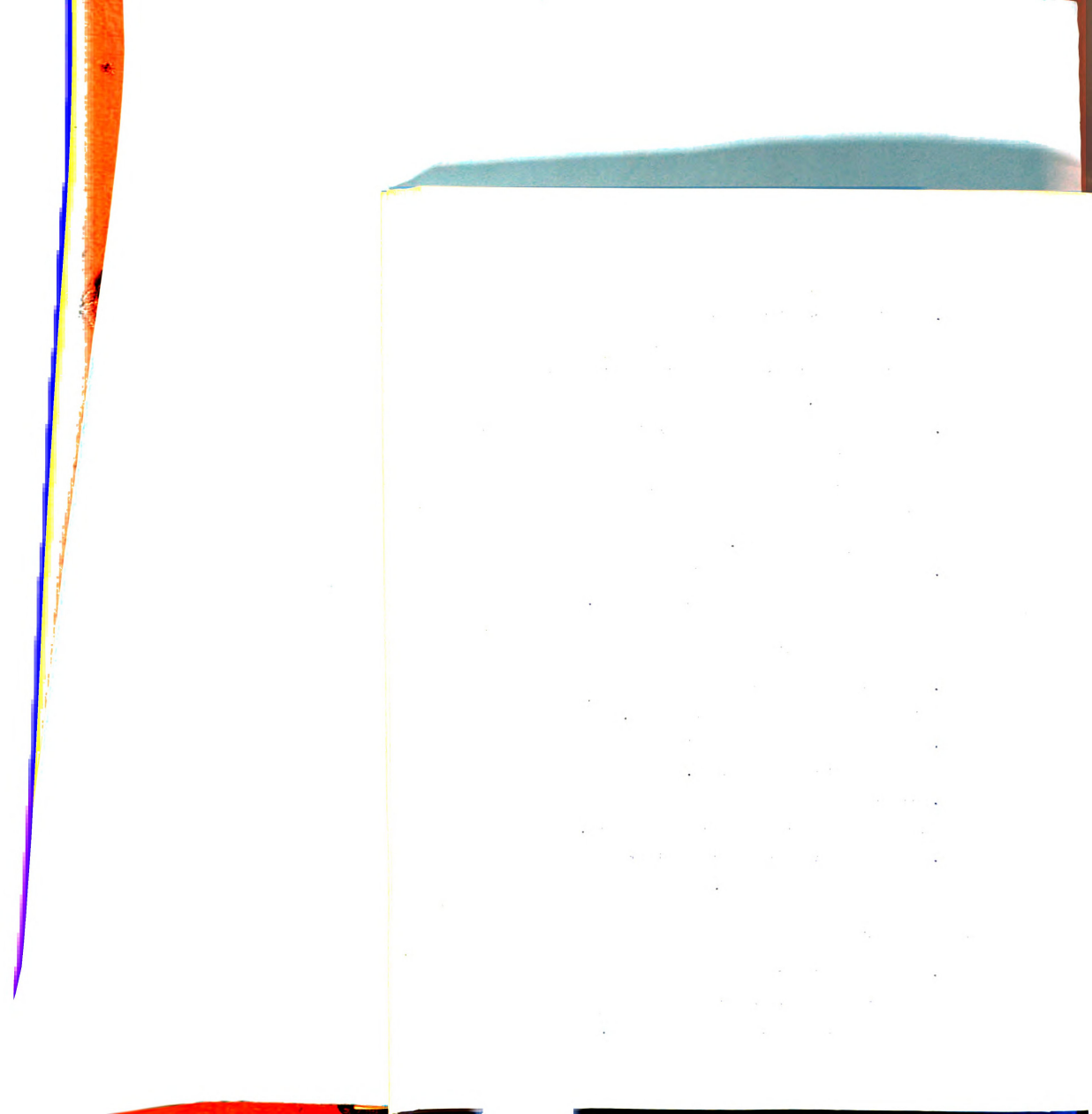
4. Unmarried farmers and married respondents with children under 18 years of age indicated relatively greater use of farm magazines than did married farmers without children or with children over 18.
5. Married respondents with children indicated greater use of commercial people as a source than either unmarried respondents or married respondents with no children, and those with no children under 18 used this source significantly more than those with younger children.
6. Respondents with no or only one dependent used radio and TV relatively more than those with more dependents.

From the standpoint of sources:

1. The land-grant system was used more by those under 35 and those who were married but had no children.
2. Commercial people were used relatively more by those respondents who were married and had children.
3. Farm magazines were used relatively more by those who were unmarried or were married and had young children.
4. Radio and TV were used more by unmarried respondents and those with no or only one dependent.

Scale of operation:

1. Those respondents who used some hired labor during the year used the land-grant system as a source of price information relatively more than those who hired no labor.



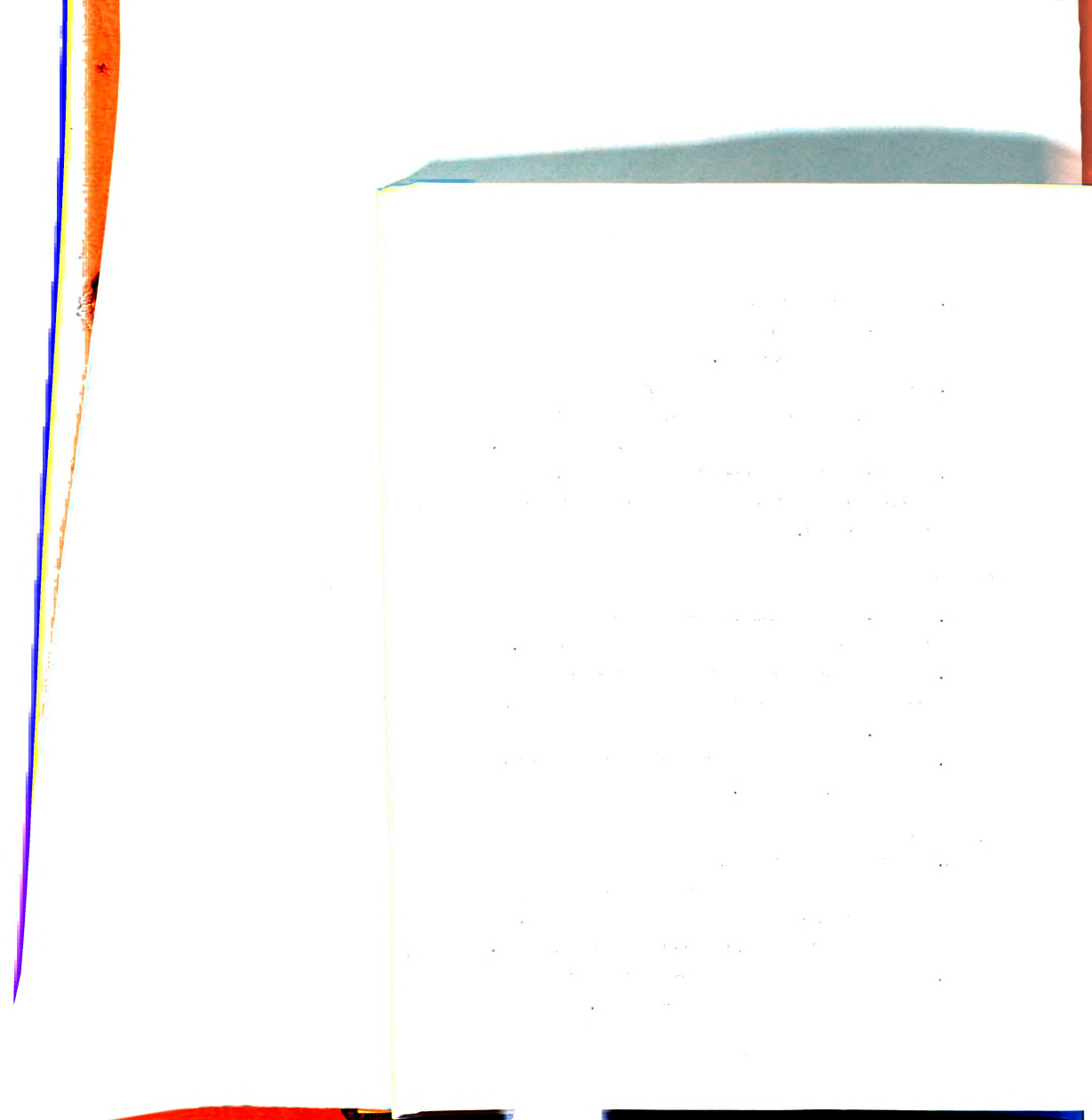
2. Those whose gross farm income was over $4500 per year used the land-grant system relatively more than those whose gross farm income was less than that.
3. Farmers with a gross farm income of $13,000 per year or more used professional counselors (especially professional farm managers) relatively more than those with lower gross incomes.
4. Those farmers with a gross farm income less than $13,000 per year used radio and TV relatively more than those with gross incomes above that.

From the standpoint of sources:

1. The land-grant system was used more by farmers who used hired labor and who had gross incomes larger than $4500 per year.
2. Professional counselors (especially professional farm managers) were used more by farmers with a gross farm income over $13,000 per year.
3. Radio and TV was more used by those farmers with a gross income under $13,000 per year.

Type of farm:

1. Specialized stock (dairy or livestock) and crop (field crops or fruit or vegetables) farmers used the land-grant system and professional counselors (especially government people, and bankers and lending agents) more than did general farmers.
2. Farm magazines were a more used source of information for stock and general farmers than for crop farmers.



Meeting attendance:

1. Those who had attended two or more Extension or farm organization meetings during the last two years used farm organizations and the land-grant system relatively more than did those who did not attend such meetings.
2. Those respondents who did not attend such meetings used farm magazines and radio and TV relatively more.

Sources for Production Information:

As indicated earlier, there is evidence of a definite relationship between certain of the control variables and the sources of production information used. However, as also mentioned, while there was evidence of such relationship for sixteen variables in the case of price information, such a definite relationship was evidenced for only three variables in connection with production information. Again, these results should not be regarded as entirely conclusive because of the small sample numbers.

As a reminder, the summary of sources of production information indicated by respondents revealed the land-grant system to be most used, with farm magazines a strong second (Table V). Radio and TV were next, followed by neighbors and relatives about evenly. Commercial people, professional counselors, and farm organizations were relatively unimportant sources of production information.

Only three of the thirty-one control variables evidenced a definite relationship with sources. These were:

1. Children in 4-H or FFA,
2. Experience out of farming, and
3. Meeting attendance

Specifically, the following observations could be made (see Table VIII):

Background

1. Respondents with children in 4-H or FFA used the land-grant system more for production information than those who did not have children in 4-H or FFA.
2. Those who did not have children in 4-H or FFA used farm magazines and radio and TV to a greater extent.
3. Those who had been out of farming used commercial people and neighbors and relatives more for production information than those who had not been out.

Meeting attendance

1. Those respondents who had attended meetings used the land-grant system more than did those who had not attended.
2. Those who had not attended used farm magazines and radio and TV more than did those who attended.

When the relatively sparse information on sources of production information is reviewed from the standpoint of the eight sources, it is apparent that:

1. the land-grant system was used more by those who had children in 4-H or FFA and who attended meetings.

Table VIII

Influence of Control Variables on Sources of Production Information Used by Farmers, Michigan (Stratum 4 only).[1]

	Farm organizations	Land-grant systems	Commercial people	Professional counselors	Neighbors and relatives	Farm magazines	Newspapers	Radio and TV	Number of mentions
	percentages								
Background									
Children in 4-H or FFA									
Yes	2.2	46.1*	4.4	3.9	10.6	17.8*	7.2	7.8*	180
No	1.4	28.5	5.4	3.4	8.2	27.9	8.2	17.0	147
						Chi-square = 17.12			
Experience out of farming									
Yes	5.0	36.1	7.8*	2.8	13.5*	19.1	8.5	7.2	141
No	1.8	40.1	2.7	4.5	6.3	23.0	8.6	13.0	222
						Chi-square = 16.92			
Meeting attendance									
Yes	1.6	46.4*	4.4	4.4	8.4	18.4*	8.8	7.6*	250
No	1.9	22.2	5.6	2.8	11.1	29.6	8.3	18.5	108
						Chi-square = 25.26			

[1]Detailed explanation of the questions providing these control variables can be found in Figure 2 of Appendix I.

*Indicates significant t-test.

2. commercial people and neighbors and relatives were used more by those who had been out of farming.
3. farm magazines and radio and TV were used more by respondents who did not have children in 4-H or FFA and who had not attended Extension or farm organization meetings.

Different Types of Information From A Given Source?

The question next rises: "When considering any one of the eighteen given communicative sources, do farmers of different characteristics to a significant degree look to that source for different types of information?" In other words, is a given source regarded by farmers in one situation with reference to a given variable (for example, age) as a source for one type of information (for example, price) while farmers in another position relative to that variable (i.e., older) look to that same source for another type of information (for example, production)?

To answer this question, a detailed analysis of each of the eighteen sources was completed. For each of these, chi-square tests of significance were completed to determine the degree of relationship between the type of information secured from a given source and each of the control variables. The summary of this analysis is presented in Table 4 of Appendix II.

It is apparent from this analysis that there is no significant relationship between the types of information secured from a given source and the different positions of respondent relative to the control variables. Therefore, one may conclude that certain communicative sources

are used for certain types of information and that those farmers who use that source do not use it for significantly different types of information than others who use it.

Again, caution must be used in interpretation. It would be false to conclude from this that farmers of different characteristics do not indeed use different sources to varying degrees. In fact, the reverse has just been shown to be true. Rather, from this analysis it can only be said that if a given farmer uses a certain source of communicative information, he does not use it for significantly different types of information than does another farmer who uses that same source.

Chapter VI

SUMMARY, AND IMPLICATIONS FOR EXTENSION PROGRAMMING

This chapter is divided into two sections; first, a summary of the findings of this study; and second, an exploration of some implications of these findings for Extension programming. In the latter section, the findings of the preceding chapters will be related to the decisions which must be made in Extension program management.

Summary of findings:

1. Data in IMS reveal that respondents feel farmers should use different patterns of information in each of the three situations: organizing a farm, operating a farm for maximum profit, and operating a farm to maximize family satisfactions.

   a. When organizing a farm, respondents indicated, a farmer should be concerned with factors with long-term implications. Thus, the pattern of information which interviewees indicated should be used emphasized production factors (soil, climate, topography, etc.), institutional factors (roads, schools, markets, etc.), and human factors (relatives, neighbors, businessmen, etc.).

   b. In operating a farm for maximum profit, respondents indicated that farmers should use most the types of information on production factors (soils, fertilizers, varieties, etc.),

prices, and new technology. Each of these has certain possibilities of short-run flexibility in terms of the farm operation.

c. When operating a farm for the greatest family satisfaction, information on institutional factors, human factors, and production were indicated by respondents to be the types which should be used most. Each of these, again, as in considerations for organizing a farm, have long-term implications, with emphasis on those things of a long-term nature having particular bearing on family life.

2. The success of the projective technique employed in questioning is attested to by the fact that no relationship between the three information patterns outlined above and the control variables was evident. Thus, apparently the respondents projected themselves from their own familiar circumstances, providing answers which are generally applicable and not influenced by personal circumstances and biases.

3. In terms of the relative importance of each type of information in light of their own experiences and for their own farm operations, respondents ranked the five types of information as follows:

production information most important,
price information next most important, and
institutional information least important,

From inspection of the information in Table III, new technology could be regarded as third most important, and human factors fourth.

4. The rankings based on importance of each of the five types of information to the respondent for his own farm operation tended to follow

the pattern of information indicated for the hypothetical situation when operating a farm for maximum profit. This suggests that the respondents tended to be profit- and operationally-oriented.

5. Different patterns of communicative sources (i.e. those sources involving the transfer of information between people by some method and means) were used by farmers in securing each of the five types of information. The most used communicative sources for each type of information could be summarized as follows:

a. Price:	Dealers, salesmen and buyers
	Farm magazines
	Radio
	Newspapers
b. Production:	County Extension agents, vocational agriculture teachers, and agricultural college representatives
	Farm magazines
	Publications of experiment stations
	Radio
	Neighbors and relatives
c. New technology:	Farm magazines
	County Extension agents, vocational agriculture teachers, and agricultural college representatives
	Demonstrations, meetings, and lectures
	Dealers, salesmen, and buyers

d. Human factors: Neighbors and relatives
Bankers and lending agents
Dealers, salesmen, and buyers

e. Institutional factors: Newspapers
Radio
People from farm organizations
Farm magazines
Neighbors and relatives

6. In general, farmers look to a relatively small number of communicative sources for each of the five types of information.

a. The four or five most-mentioned sources accounted for about two-thirds of the "mentions" for each type of information.

b. Certain of the sources were very unimportant for a given type of information.

c. For no one type of information were all eighteen communicative sources mentioned.

7. In general, a communicative source of information is looked to for more than one type of information.

a. Twelve of the eighteen sources were indicated as a source for each of the five types of information.

b. Only two of the sources were indicated for only one or two types of information.

c. However, certain sources (for example, formal schools and professional farm managers) were quite unimportant sources for any of the types of information.

8. Farmers in different positions relative to certain of the control variables employed different patterns of communicative sources when securing a given type of information. Data limitations prevented exhaustive analysis of such relationships, but moderately reliable evidence was available for both price and production information source patterns.

9. In securing price information, the general pattern of sources based on the number of farmers reporting use of the source was as follows, with the most mentioned source first: commercial people, farm magazines, radio and television, newspapers, land-grant system, neighbors and relatives, professional counselors, and farm organizations (see page 43). However, within this general pattern, certain variations related to the control variables were apparent.

a. Respondents who were large scale, specialized operators; had completed 12 or more years of school; and had agricultural training in their formal schooling looked more to the land-grant system and professional counselors (especially bankers and lending agents) for price information.

b. Respondents who had completed less than 12 years of school and had no formal training related to agriculture looked more to commercial people, neighbors and relatives, and radio and TV as sources of price information.

c. Respondents who attended meetings looked more to farm organizations and the land-grant system for price information while those who were non-attenders looked to farm magazines, and radio and TV relatively more.

d. Those respondents who had been out of farming for seven or more years tended to use commercial people more as a source of price information, while those who had not been away from farming looked to the land-grant system, newspapers, and radio and TV more.

10. In securing production information, the land-grant system and farm magazines were generally the most important sources. Following were radio and TV, neighbors and relatives, newspapers, commercial people, professional counselors, and farm organizations in that order. The data, which permitted only limited further analysis, revealed that:

a. respondents who had children in 4-H or FFA and who attended meetings looked more to the land-grant system for production information while those who did not have children in 4-H or FFA and did not attend meetings used farm magazines and radio and TV relatively more; and

b. respondents who had been out of farming used commercial people and neighbors and relatives more for production information than did those who had not been out of farming.

These findings relative to sources of production information in general concur with the findings reported above with reference to sources of price information.

11. When farmers with different characteristics use a given source of information, they use it for essentially the same pattern of information. Thus, for example, farmers look to county Extension agents, vocational agriculture teachers, and agricultural college representatives for information on production, new technology, institutional factors,

human factors, and price, in that order. This tends to be true for all farmers, regardless of their characteristics. This suggests that each source is looked to as being a "good source" for certain types of information.

Implications for Extension programming:

In exploring implications which these findings may hold for Extension programming it will be helpful to look first at two fundamental questions. These questions relate to criteria in Extension programming and to the role of Extension.

The first question is this, "to what extent should the expressions of farmers regarding the types of information farmers should use or the relative importance of various types of information be used as a criterion in Extension planning?" Certainly such expressions of farmers have both strengths and limitations as a criterion in the decision-making process of Extension administrators.

A basic strength of this criterion relates to the function of the Cooperative Extension Service as stated in its enabling legislation, the Smith-Lever Act:

> "....to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same...."

An apparent intent of the agricultural and legislative leadership in the passage of this Act was that the information needs of farm people should be met. It follows then that some attention should be given to

the types of information farmers regard as important and useful in their decisions. The criterion of farmer responses to these questions thus becomes fundamental in Extension planning.

At the same time, it should not be assumed that tabulations regarding types of information farmers should use and the relative importance of the various types of information can be regarded as the sole and final consideration. In the first place, such tabulations are subject to the usual sampling errors as well as to possible respondent biases, although serious difficulties of these kinds have not been detected in the data reported here.

Beyond this however, a more fundamental question can be posed regarding the appropriateness of this criterion, no matter how accurately measured. Farmers may not always be in the best position to indicate their information needs, either present or future. Lack of awareness or appreciation for the real value of certain types of information, perhaps particularly those components within the five major classifications, may give such categories relatively less importance in the responses of farmers than would be the case if the respondents were aware and appreciative of those elements. Further, a research scientist or Extension worker abreast with the latest developments in any field may be able to foresee farmers' future needs for such information more clearly than can farmers themselves. Certainly this is one role of both research and Extension programs.

Furthermore, in a broader and deeper educational sense, educational institutions have been charged with a responsibility for

"liberal education." The Extension Service, as an off-campus phase of such institutions, has this responsibility also, implying a challenge to leadership in the development of fundamental values. It is upon such values that patterns of wants and preferences are based and in terms of which problems are partially defined. In such terms, it is not altogether appropriate for an educational agency to base its program exclusively on the stated wishes of its clientele.

In summary to this question of the appropriateness of this criterion in Extension planning, it can be said that the types of information which farmers indicate should be used and the relative importance attached to the types of information by farmers should be given important but not exclusive consideration.

The second question relates to Extension's role as a source of useful information for its farmer clientele. Should Extension aspire or strive to be a major source for all types of information for all farmers? If not, what is an appropriate position or Extension in this regard?

As the data have indicated, farmers look to many sources for information. Different patterns of sources are used for the various types of information. Different farmers use different sources for a given type of information. And in fact, the land-grant system, of which Extension is a part, has long recognized the desirability of utilizing various media, channels, and techniques in making information available ultimately to farmers. Thus have developed programs with mass media such as press, radio and television, and with groups related to agriculture, such as commercial people and professional counselors.

In this complex, it would seem unrealistic indeed for Extension to have as its goal a position of major importance for serving as a source for all types of information for all farmers. But this in no way reduces Extension's responsibility or concern for the availability of and adequacy of all types of information for all farmers. Thus, while Extension in many instances may not be a direct source of a given type of information for a given farmer, Extension should be aware of specific sources of information for various farmers and, as well, may play a part in influencing the quantity and quality of the information supplied. It is in reflection of such a concern, really, that Extension very often works with commercial people, farm organizations, representatives of various media, and the like.

Thus it is seen that, though Extension may not always serve as a source of information of certain types and may have difficulty in reaching certain farmers, it is vitally important for Extension people to be aware of the many sources of information utilized by various farmers for various types of information and to employ such knowledge in planning. An essential problem in Extension programming is the employment of limited resources in the most effective ways and combinations. An understanding of farmers' information source patterns can contribute to this end.

In light of these statements, the following seem to be pertinent implications for Extension program planning which evolve from this study:

1. It is apparent that farmers feel an expressed need for different patterns of information in various circumstances. When consulting with or developing programs for farmers in the process of organizing

(or, to some extent, re-organizing) a farm business, primary emphasis should be devoted to those types of information (or components within the broad categories) which have long-term implications. These include particularly information on production, institutional, and human factors. While this study reveals the general pattern of information useful for farm organization, a further detailed study designed to reveal the kinds of information necessary to the solution of specific reorganizational problems would seem warranted.

Once the organizational job has been essentially completed, so that the primary concern becomes operation of the farm business, different patterns of information should be used, according to IMS respondents. When maximum profit is the goal, greatest concern should be with relatively short-lived types of information, which have possibilities of relative flexibility in the short-run. These include information in the production, price, and new technology categories. On the other hand, when the goal of the farm operation is maximum family satisfactions, longer-term considerations again become relatively more important, as in organizing a farm. These include institutional and human factors, and certain types of production information. From Extension's standpoint, it is significant that these three patterns of information did not differ significantly for farmers in different positions relative to the control variables.

2. These findings regarding types of information for organizing and operating farms suggest certain possibilities for Extension programs in the future:

a. If, through the years, the process of farm transfer from generation to generation is altered and facilitated markedly by new procedures, such as incorporation of family farm operations, the frequency of and problems of farm organization may be quite different from today. Thus, the needs for information with an organizational orientation may be sharply reduced. To the extent that current Extension programs are organizationally oriented, program adjustments may be necessary.

b. Furthermore, if, as some believe, agriculture is now going through a major transitional period, with much reorganization of farm enterprises, particular emphasis on patterns of information helpful in farm organization may be appropriate. However, as such a transitional period may draw to a close and a period of relatively greater stability arrive, a shift in the relative patterns of information to those types more appropriate in decisions of farm operation may be in order. In this regard, it will be recalled that IMS respondents tended to be profit oriented, indicating a ranking of information important for their own operations which very nearly paralleled that indicated which farmers should use in operating for profit.

c. If the operations of Extension were to become more intensive in terms of working more with farmers through personal contact and relatively less through mass media, a clear appreciation of the different patterns appropriate in various circumstances would be important. The experimental program

with township Extension agents, the Farm and Home Development emphasis, and the assignment of specialists to counties are examples of such intensification of Extension efforts. In general, the more personalized the contact with the farmer, the greater is the need for precise, specific information to meet his individual needs.

d. Evidence from the study indicates that operators of large and specialized farms look to Extension for certain types of information relatively more than do other farmers. If it be Extension's desire to serve this commercial farming clientele, recognition of specific kinds of information needed by this group in organizing and operating their farms will be essential. Further detailed studies may be necessary to meet such information requirements.

3. The difference in information patterns which were indicated WW farmers should use in the two operating situations, i.e. when either maximum profits or maximum family satisfactions is the goal, suggests certain decisions for those with Extension program responsibilities. A value judgement in planning can be made which may result in shifts of farmers' positions relative to the alternatives of "operating for profit" as compared to "operating for family satisfactions." Different proportionate emphases on the various types of information, with appropriate suggestions for application, might facilitate such shifts. Two comments in this regard seem appropriate.

First, in reference to Extension's responsibilities in "liberal education," it is appropriate to be concerned with fundamental values.

Thoughtfully, those individuals who attach ultimate significance to profits in their operation may need encouragement and guidance in developing their value structure to more adequately satisfy more appropriate ultimate needs and preferences of themselves and their families by regarding profits as instrumental. Conversely, those who seem motivated by family satisfactions to an extreme may need assistance in exploring alternatives, such as the implications increased profit in the farm operation might ultimately have in terms of family satisfactions. Thus, such matters as the postponement of current leisure to the end of future comfort or satisfaction become pertinent.

Second, it would be naive to assume or to imply that Extension is the only source of information for farmers, or that the decisions of farmers (including those regarding fundamental values) are influenced only by Extension efforts. Obviously, many other factors and influences come to bear. Nonetheless, the significance of Extension's influence relative to the value framework of individual farmers and their families cannot be ignored. Indeed, it is a question of great import to be faced by Extension personnel. Exploration of this question, however, is not the purpose of this study.

4. The effectiveness of the projective questioning technique employed in IMS suggests possible usefulness of this technique in Extension's educational efforts. In securing IMS data relative to the types of information a farmer should use in first organizing and then operating a farm, a hypothetical situation was created. The respondent was asked to answer on the basis of "a strange family and a strange farm." In thus "role playing," the respondent could give answers

influenced by his past experiences but not influenced by biases of his personal situation relative to feelings of pride or embarrassment. This technique secured somewhat different responses than when the respondents were asked to rank the types of information on the basis of setting up and operating their own farm on the basis of their own experience, and no relationship between the patterns of information indicated that the farmers position relative to the control variables was apparent. This suggests that such a projective "role playing" technique might be useful to Extension personnel in either working with individual farmers or in surveying farmers with reference to various questions in situations when the influence of personal bias may be detrimental.

5. Different patterns of sources of information were used by farmers in securing each of the types of information. These findings sould suggest that, in general, Extension programming should recognize the sources most used by farmers for each of the types of information. Whether Extension's concern in any instance is with communicating directly with its farmer audience, with evaluating the adequacy of information supplied, or with supplying information to or working with sources which in turn serve farmers directly, knowledge of information source patterns should be used.

To some extent, of course, the pattern of sources for farmers in a given area will be determined by the availability of and quality of information from various sources in that particular area. This is to say, in another way, that the pattern of sources used by farmers is and can be shaped by the efforts of the sources themselves.

6. Farmers in different positions relative to certain of the control variables used different patterns of sources in securing a given type of information. This evidence has broad implications in Extension programming, both in terms of sources employed and in terms of audience reached.

a. When considering the dissemination of information, it should be recognized that the channel selected (source to the farmer) will in part determine the audience reached. Thus, from this evidence, price information channeled through radio would reach relatively more farmers with less than 12 years of schooling since such farmers look to radio for price information relatively more than do farmers who have completed 12 or more years of school. If radio were selected, then, this would be the anticipated immediate result. However, as previously mentioned, this pattern might change as more farmers became aware of and accepted radio as a source of price information.

b. The second implication is in terms of audience. In reaching various specific audiences with certain types of information, various sources are appropriate. It is apparent, for example, that farmers with less than 12 years of schooling, no additional training related to agriculture, and no 4-H or FFA experience looked especially to commercial people for price information. In a concern with the adequacy of price information for this segment of the audience then, with reference to both quantity and quality, Extension might

evaluate the price information supplied by commercial people. If a need for improvement was indicated, Extension might attempt directly to gain acceptance as a source by this segment of the audience or might work with commercial people to realize the necessary improvements. Either course has advantages.

c. If, as is apparently the trend, farm operations are becoming larger and more highly specialized, and farmers are securing more formal education, a challenge to Extension is suggested in that operators of such large specialized farms and farmers with more education looked to the land-grant system more than did other farmers. This would suggest that Extension is in a position to meet the information needs of commercial farming, to the extent that those farmers with large and specialized farms are already looking to the land-grant system to a degree for information. It would be expected of course that Extension will be regarded as a "good source" only as it meets the needs of its clientele. The earlier implications, therefore, regarding information patterns in organizing and operating farms become even more pertinent. If, as farms become larger, changes in procedures of transfer are devised to minimize the reorganizational problems, and if farming generally moves from a transitional stage with many organizational problems to a relatively more stable situation in which operating problems become paramount, these changing circumstances must be reflected in patterns of Extension information.

d. Various alternatives confront Extension with reference to its appropriate clientele. Decisions regarding channels of information employed in Extension can in part determine the audience served. In turn, a decision regarding audience can be implemented in part through the employment of the sources of information to which that audience looks.

e. In another study utilizing IMS data, Partenheimer[13] reported that farmers evidenced a high degree of awareness of economic concepts. In studying price expectation models, he discovered that empirical content, integration of conceptual and empirical content, and conceptual completeness of the models were present "to a surprising degree." These models were associated in part with education. If, as is apparently the trend, farmers are receiving more education and if farmers with increased education have more economic maturity and at the same time look more to the land-grant system for price information, Extension is confronted with the challenge of supplying such farmers with the kinds of price information necessary for their decision-making responsibilities. An awareness of the price expectation models employed by farmers, with an understanding of the kinds of price information necessary to the development of such models, would be necessary in designing an Extension

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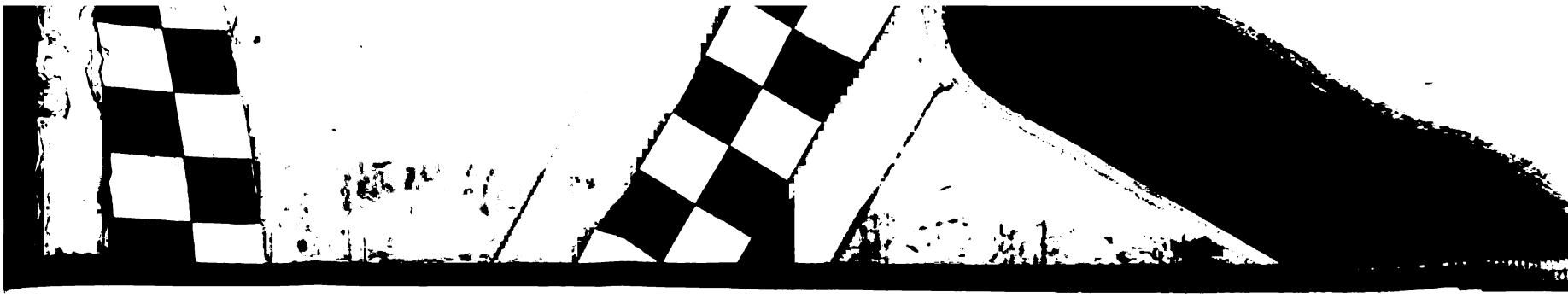
[13]Partenheimer, E. J., "Some Expectation Models Used by Selected Groups of Midwestern Farmers," Ph.D. Thesis, Michigan State University, 1959.



program to this end.

Implications for research:

The findings of this study have implications for the conduct of future related research and, in addition, suggest many areas of interest which might be explored fruitfully. More specifically, they would first suggest that research studies related to communications might well recognize the five broad types of information categories, the different patterns of information indicated for farmers in various circumstances, and the various communicative sources employed by different farmers in securing information they need.

A recognition of the pattern of information which farmers indicate should be used in farm organization combined with an awareness of the current reorganizational activities in agriculture would suggest further investigation if the most appropriate patterns of information are to be supplied. As farmers confront such developments as vertical integration, contract farming and incorporation of family farm operations, they must make decisions regarding farm organization. In making these decisions, research results supplying pertinent information, particularly related to production, institutional, and human factors, would be helpful.

The different patterns necessary then in operational situations suggest the need for further study also. Some would contend that the program of the Extension Service gives relatively greater emphasis to problems of "farm organization" than to those of "farm operation," with much effort devoted to educational programs which suggest changes implying some degree of reorganization of the farm business. At the same

time, this study would suggest that the respondents were essentially "operationally-oriented." Research evaluation of the Extension program coupled with analysis of the major problems of farm managers would be helpful in making Extension program decisions. Further, appropriate research could reveal the specific operational problems of farm operators so that educational programs could be designed accordingly.

Although this study has outlined the patterns of information in terms of broad categories, analysis in terms of components of these categories as related to specific organizational and operational situations will be necessary. Such studies should take into consideration the influence of the various control variables in reference to sources of information.

Relevance to dynamic economics

While this study addressed itself essentially to the types of information used by farmers and the sources of such information, the relevance of the findings of this investigation to the theory of the firm in dynamic economics should not be overlooked. In dynamic theory, the assumption of perfect knowledge is relaxed, and the manager has incomplete knowledge. The management function, which has no role in static theory, becomes necessary in the adjustments of the firm to changes and uncertainties. The managerial problem is that of determination of the direction of movement toward a new equilibrium position and of moving toward it.

In the management role, the manager performs five functions in the process of adjusting to change or solving a problem:

(1) observation: securing all available information and facts bearing on the situation, from all possible communicative and non-communicative sources.

(2) analysis: appraising the observations as they apply to his situation.

(3) decision-making: determining whether to try a given alternative or to reject it.

(4) action-taking: following a course of action determined through observation, analysis and decision.

(5) responsibility-bearing: accepting responsibility for financial loss or gain, effect on self and on family, and legal and moral responsibility to society which may result from the action taken.

The manager performs the first three of these functions as a learner. Since the efficiency and effectiveness of the later steps in the learning process are determined in part by the first step, i.e. observation, it is appropriate to focus attention on various aspects of this function. Essentially, such focus has been the intent of this study.

As the whole process by which the entrepreneur and/or society adjusts to changes in a situation of risk and uncertainty is viewed, one is very much aware of the learning process and the situations pertaining to different degrees of knowledge. The costs and values of learning have pertinence in reference to the five degrees of knowledge: the certainty, risk, learning, inaction, and forced-action situations.

Related to these are such conceptual considerations as propensities to consume and invest, liquidity preferences, insurance and strategy principles, and the like. Earlier reference has been made to expectation models and the implications of the findings here in that regard.

Through all of this, there is an underlying concern with the imperfect knowledge situation of the manager with reference to the five broad type of information categories: price, production, new technology, human, and institutional. For example, propensity to consume or to invest is in part dependent on the estimate of the future. This estimate in turn is a reflection of the information a person has. In the framework of dynamic economics then, a study of the information pattern of farmers and the sources to which they look for such information is both appropriate and useful.

Through the findings of this study, there comes clearer insight into the pattern of information which farmers find useful in various circumstances. Further, an understanding of the various sources employed by different farmers in the observation function related to different types of information has been developed. And finally, some implications of these findings as they relate to Extension's work with managers in dynamic situations have been explored.

APPENDIX I

FIGURES

Figure 1

Summary of Component Categories of Information Included in Seven Broad Types of Information Classifications

PRICE INFORMATION:

1. Prices paid by farmers

2. Prices received by farmers

   General and unspecified
   Prices for crops
   Prices for livestock and livestock products

3. Support price information

4. Characteristics of prices

   Long range trends in prices
   Relative prices
   General economic outlook
   Seasonal prices
   Current prices and short term trends
   Past prices

5. Cost of living and farming

6. Factors affecting prices

   Current market conditions
   Supply outlook
   Demand outlook
   Inflation, deflation, war
   Price outlook

PRODUCTION INFORMATION:

Inputs

7. Livestock production

   Breeds, breeding stock, grains and roughage, feeding rates, labor, management, insects and diseases, water supply, general and other

Figure 1

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PRICE INFORMATION:

1. Prices paid by farmers

2. Prices received by farmers

   General and unspecified
   Prices for crops
   Prices for livestock and livestock products

3. Support price information

4. Characterization of price

   Long range trends in prices
   Relative prices
   General economic outlook
   Seasonal prices
   Current prices and short term trends
   Past prices

5. Cost of living and farming

6. Factors affecting prices

   Current market conditions
   Supply outlook
   Demand outlook
   Inflation, deflation, war
   Price outlook

PRODUCTION INFORMATION:

Inputs

7. Livestock production

   Breeds, breeding stock, traits and complexes, feeding
   rates, labor, management, insects and diseases, water
   supply, general and other

8. Crop production

Varieties, timing, rotations, machinery and equipment, insects, diseases, weeds, management, labor, fertilizer and fertilizer use, irrigation, general

9. Soils

Handling characteristics, texture, soil condition, topography and profile, type and kind, productivity, fertility and acidity, drainage and tiling, moisture, history, general, adaptability, management practices, tillage practices, erosion

10. Other

Weather, farm buildings, fencing, machinery and equipment, diseases and insects, other

Outputs

11. Crops

General, kinds, yields

12. Livestock

General, kinds

13. Other output information

14. Other production information

Farming practices of neighbors
Farming in neighborhood, community, area
Livestock (no input-output distinction)
Crops (no input-output distinction)
Marketing process
General history of farm
Farm composition (size, acres of crops, etc.)
Type of farming area
Kind and quality of farm

NEW TECHNOLOGICAL INFORMATION:

15. Disease, insect, and weed control
Feeds and feeding rates
Machinery, equipment, and labor saving devices/practices
Fertilizers and fertilizer rates
Crop and soil production practices
Livestock production practices
Buildings, fencing and non-land real estate

HUMAN FACTORS:

16. Farmer or self

    General personal qualities
    Education and experience
    Credit rating and financial status
    Work attitudes and orientation
    Managerial ability
    Health and age
    Religion and religious practices
    General and specific aspects of preference system
    Other

17. Self-environment of farm

    Family characteristics
    Location and setting
    Other

18. Other individuals

    Landlords
    Businessmen
    Others

19. Neighbors as a group

    Sociability
    Status
    Cooperativeness (work, emergency)

20. Community populace

    Sociability
    Status
    Other

INSTITUTIONAL FACTORS:

21. Neighborhood

22. Community as a unit

    General structure and service facilities
    Customs
    Activities
    Status and control mechanisms
    General

23. Schools (including colleges)

    Kind and quality
    Distance, location, accessibility
    Activities
    Other and general

24. Churches

    Kind and quality
    Distance and location
    Activities
    Other and general

25. Markets

    Distance and location
    Kinds and quality
    Other and general

26. Social, entertainment, recreational facilities and activities

27. Transportation systems

    Roads

28. Politics and political parties

29. Governmental financing

    Taxes

30. All local and state government

31. National government

    Policies and programs
    Organizations specified

32. Private credit arrangements

33. Tenure arrangements

34. Labor organizations

35. Non-governmental farm organizations

36. Foreign and world news and world affairs

37. Other organizations

38. Other information on institutions

39. Labor market and general labor situation

40. Experiment stations and their work

HOME TECHNOLOGY:

41. All information on existing and new technology related to the home.

ANALYSIS:

42. Ways of analyzing

Relate farm activities to family satisfaction
Figure, reduce &/or carry costs
Figure, improve &/or maximize profits
Diversify &/or integrate enterprises
Relate, spread, or shave farm operating function

43. Advice to analyze

Keep records and keep books
Statements to analyze

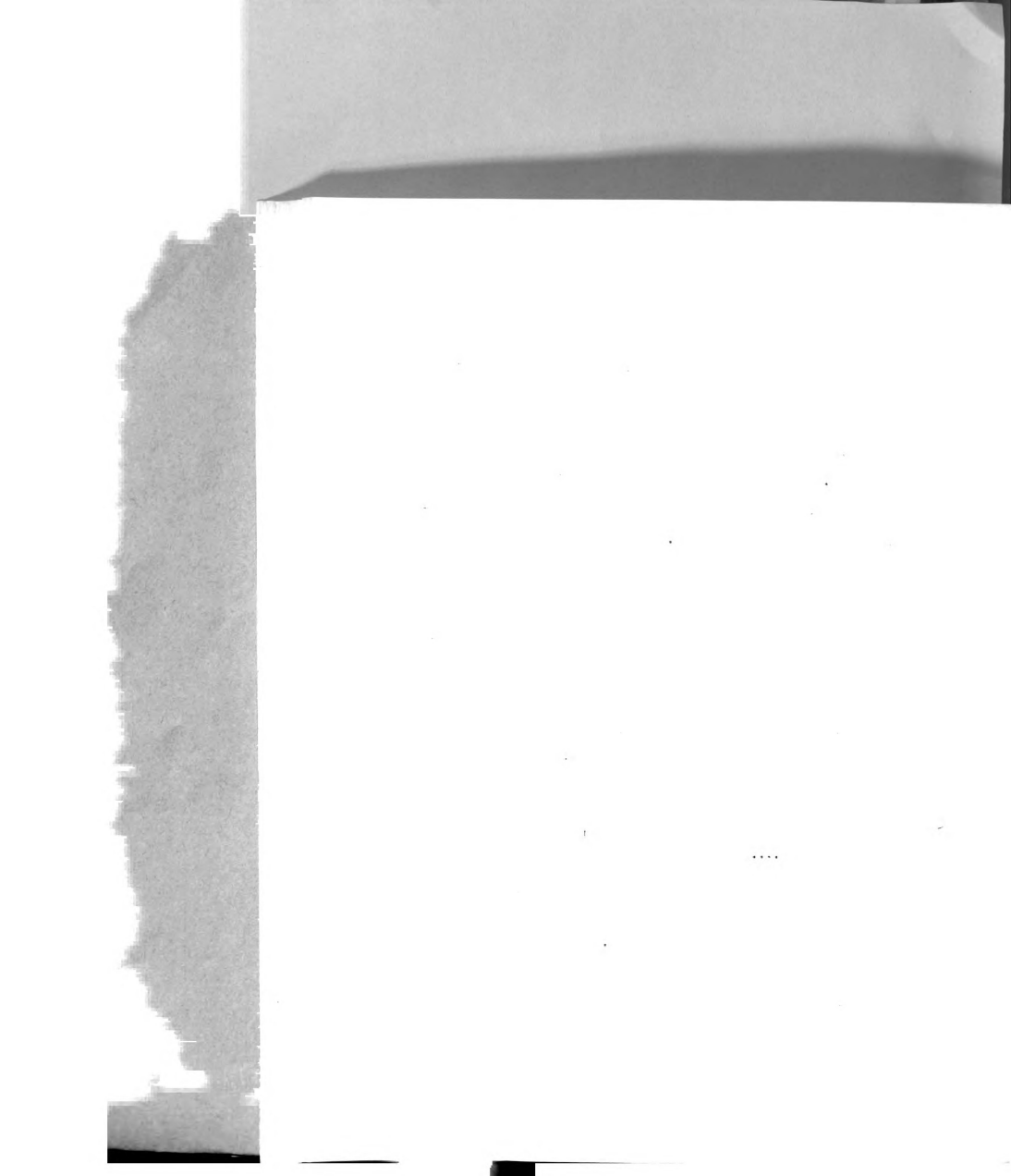
Figure 2

Summary of Questions Serving as Control Variables, With Tabulations of Michigan Respondents

Description of Michigan Sample Farmer

Control questions revealed descriptive characteristics of the respondents. Since these classifications are vital to the analysis which follows, it is important to review briefly the control questions which were used in the IMS. For convenience in the analysis each characteristic is described by a phrase which is underlined in the following summary:

	Number of Michigan respondents
Childhood on farm	
"Did you grow up on a farm?"	
All of childhood spent on farm	170
Part of childhood spent on farm	19
None of childhood spent on farm	10
Agricultural training in school	
"What are the names of the schools you've attended? .... Did they give you any training in agriculture?"	
College (plus high school and/or grade school, if any)	6
High school (plus grade school, if any)	44
Grade school only	4
None	140



	Number of Michigan respondents
Last grade of school	
"What was the last grade of school you attended?"	
Less than 8	26
8	79
9 - 11	40
12	38
13 - 15	9
16 and over	6
Additional training related to agriculture	
"Have you had any additional training, such as short courses or vocational training?"	
No	146
Yes	53
Kind of additional training	
"If yes, what was it?"	
Type of direct farm training:	
GI or veteran's training	11
Adult vocational agriculture, short courses or regular meetings	20
Mechanical training relatable to agriculture	6
4-H or FFA Member	
"Did you ever belong to: a 4-H Club? the FFA?"	
Yes, to both	9
Yes, one or other	24
No, neither	163

	Number of Michigan respondents
Children in 4-H or FFA	
"Have any of your children belonged to 4-H or FFA?"	
Yes	81
No	109
Years farming on own	
"How many years have you operated farms for yourself?"	
Up to 10 years	71
11-15 years	24
16-25 years	50
26-35 years	34
36-40 years	10
41 +	10

Experience out of farming

"Were you ever out of farming? If yes, have you ever lived in a city?"

Out of farming	Lived in city	
Yes	Yes	58
Yes	No	20
Yes	Not ascertainable	14
No	Yes	1
No	No	7
No	Not ascertainable	98

Length of non-farm experience

"If you were 'out of farming', for how long were you out?"

Up to	2.9 years	19

Children in 4-H or FFA

"Have any of your children belonged to 4-H or FFA?"

	Number of Michigan respondents
Yes	51
No	100

Years farming on own

"How many years have you operated farms for yourself?"

Up to 10 years	11
11-15 years	24
16-25 years	30
26-35 years	24
36-40 years	10
41 +	10

Experience out of farming

"Were you ever out of farming? If yes, have you ever lived in a city?"

Out of farming	Lived in city	
Yes	Yes	38
Yes	No	20
Yes	Not ascertainable	14
No	Yes	1
No	No	7
No	Not ascertainable	98

Length of non-farm experience

"If you were 'out of farming', for how long were you out?"

Up to 2.0 years	19

	Number of Michigan respondents
Length of non-farm experience (continued)	
Up to 3 - 6.9 years	12
7 - 15.9 years	26
16 or more years	12
None or not ascertainable	107
Kind of non-farm experience	
"If you were 'out of farming', what kinds of work did you do during this time?"	
Gave technical experience of value in farming	27
Gave managerial training	1
Gave personnel handling experience	9
Indeterminate	52
Work Off-farm	
"Do you ordinarily work off the farm? If yes: all year or part of year? Full day or part day?"	
None	138
Up to 3.99 months, Part	0
Up to 3.99 months, Full	4
4 - 7.99 months, Part	4
4 - 7.99 months, Full	9
8 - 11.9 months, Part	0
8 - 11.9 months, Full	0
All year, Part	4
All year, Full	27
Part of year, but portion of year or length of work day not ascertainable	13

	Number of Michigan respondents
Proportion of Gross Income from Farming	
"What proportion of your total gross income from all sources came from farming last year?"	
Less than 1/2	16
About 1/2 up to 3/4	21
About 3/4 to more than 3/4 (but not all)	18
Age of respondent	
Up to 24.9 years	5
25 - 29.9	8
30 - 34.9	24
35 - 44.9	52
45 - 54.9	52
55 - 64.9	39
65 years and over	17
Stage in family cycle	
"We'd appreciate knowing who also lives here, their approximate age, and whether they're dependent on you?"	
Unmarried	12
Married, no children	10
Married, with any children under 5 years	53
Married, with children between 5 and 18 years of age but none under 5	52
Married with children at home but none under 18	11
Married, with children but none at home now	57

	Number of Michigan respondents
Number of dependents	
"We'd appreciate knowing who also lives here, their approximate ages, and whether they're dependent on you? .... Are there any other persons not living with you to whom you contribute financial support?"	
Number of dependents (excluding respondent)	
1	64
2 - 3	69
4 - 5	41
6 or more	14
None	7
Use of hired labor	
"Did you use any hired labor in running your farm last year? If yes, did they work for you year round or part time?"	
None	97
Year round	13
Part time only	87
Average gross farm income	
"What was your average gross farm income in the last three years?"	
$2500 - 4499	67
4500 - 8499	67
8500 - 12,999	35
13,000 or more	19

Number of Michigan respondents

Net worth

"We'd like to establish an estimate of your net worth. Could you please give me your best estimates of the value of your assets at the beginning of the year. We want estimates of the actual values, not the book values for accounting purposes. The point is, what were these items worth to you? (Itemized estimates of land and building; livestock; machinery and equipment; feed and crops, cash on hand; accounts receivable; value of stock, bonds, and other investments; and value of other assets)"

"Now, how about your financial obligations at the beginning of the year? (Itemized estimate of real estate debt, short-term and other notes, accounts payable, household and other installment debts, and other debts)"

Difference equals net worth.

0 - $ 9,999	8
$10,000 - 14,999	24
15,000 - 19,999	21
20,000 - 24,999	26
25,000 - 29,999	19
30,000 - 39,999	38
40,000 - 49,999	14
50,000 - 69,999	23
70,000 and over	9

Total Assets (From previous question)

$ 0 - 4999	0
5000 - 9999	5
10,000- 14,999	14
15,000- 19,999	14

	Number of Michigan respondents
Total Assets (continued)	
$20,000 - 24,999	22
25,000 - 29,999	12
30,000 - 39,999	32
40,000 - 49,999	20
50,000 - 69,999	15
70,000 - 99,999	5
100,000 and over	4
Total debts (from previous question)	
None	84
100 - 1,999	11
2,000 - 4,999	21
5,000 - 9,999	14
10,000 and over	10
Ratio: debts to assets (from previous question)	
Ratio of total debts to total assets	
.001 - .19	31
.20 - .39	19
.40 - and over	6

Proportion rented

"Now first of all, how many acres, all together do you own? (How many acres) are you renting this year?"

The proportion of total acres managed acquired through renting equals $\frac{\text{(acres rented}}{\text{(acres rented plus acres owned}}$

	Number of Michigan respondents
Proportion rented (continued)	
Proportion rented (percent)	
None	121
.1 - 49.9	45
50 - 99.9	23
All	10

Total acres tilled

"How many of these acres (owned and rented) are you actually using as crop land and rotation pasture?"

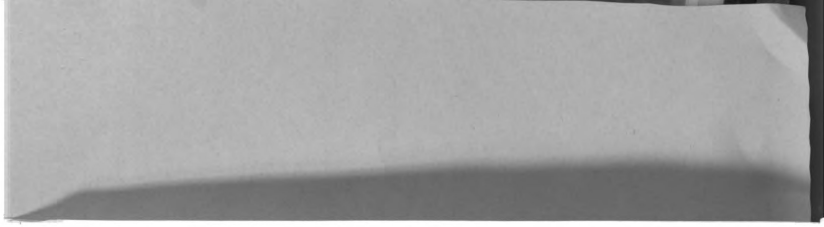
Acres	
1 - 49	23
50 - 89	52
90 - 189	102
190 and over	15

Type of farm

"What do you consider to be the main crop or livestock product on your farm? What did you do with it last year? What other crops or products did you market last year? What proportion of your last year's total farm income did each of these account for?"

Type of farm	
Dairy	75
Fat stock	18
Cash crop	48
Fruit and vegetable	19
General	17
Cash crop and dairy and/or fat stock	12

	Number of Michigan respondents
Importance of Types of Information	
Rank I:	
"In the light of your own experience in getting information to set up and run your farm to get the most out of life, which of these five types of information have you found to be the most important to you?" ("for profit" was substituted for "to get the most out of life" on schedule forms C, D, E, and F)	
Price	68
Production	74
New technology	17
Human factors	14
Institutional factors	6
All ranked equally	12
Rank II:	
"...Which of the remaining four do you think has been most important to you?"	
Price	44
Production	57
New technology	29
Human factors	22
Institutional factors	21
All ranked equally	12
Rank V:	
"...Which of the five has been least important?"	
Price	8
Production	5
New technology	43



	Number of Michigan respondents
Rank V: (continued)	
Human factors	46
Institutional factors	53
All ranked equally	12

Sum of additional difficulties

"We've been talking about information needs that you may have had in making decisions about specific problems. However, there are a number of other difficulties involved in making decisions and acquiring information that you may also find to be problems. Here is a list of some of them. (Hand card to respondent) I'd like you to tell me which of these or any others not on this list have been problems in your own experience."

1. Knowing how to change your production plans.
2. Recognizing the existence of problems.
3. Defining the objectives of your family.
4. Knowing when you are in the "wrong track" in your attempt to reach a desired goal.
5. "Putting your finger" on the difficulty when you know a problem exists, or you know something is wrong.
6. Just keeping up with all of the new information relating to farming that constantly comes along.
7. Getting information organized in your own mind so that you can see what it means to you.
8. Knowing how and when to arrive at decisions (once you've organized the information) when some of it leads you to one conclusion and some to another.
9. Any others not on this list.

	Number of Michigan respondents

Sum of "additional difficulties" equals number of them indicated by individual respondent.

Sum of additional difficulties

None	33
1 - 2	88
3 - 4	30
5 - 9 or more	40

Methods of reaching conclusions

"Two methods of arriving at conclusions are illustrated by the examples on this card (interviewer present card).

1. "In some cases we draw conclusions from experience. Thus, we may notice that in certain situations certain results always seem to follow. On the basis of this, we conclude that these results always occur in this situation. An example might occur in fertilizing a field. Thus, if a farmer sees that the poor, thin spots in a field respond to fertilizers more than the rich spots, he may conclude that poor, thin spots always respond more than rich spots.

2. "In other cases, we 'reason out' conclusions about new situations facing us from facts and principles we know or assume to be true. For instance, a farmer may know or assume that a certain farm arrangement will save labor and then 'figure out' how the use of this arrangement would affect the amount of labor which would be left over for use elsewhere in his business.

   a. "Do you use both, mainly one, only one, or neither of these methods in arriving at conclusions?"

Both	70
Mainly, or only, induction	24
Mainly, or only, deduction	7

Number of Michigan respondents

Method most natural

b. "Which of these thinking methods is most natural for you to use?"

Both	14
Mainly or only induction	66
Mainly or only deduction	17

Meeting attendance

"In the last two years have you attended two or more:

County agents or Extension specialists meetings?

Meetings of farm organizations like the Farm Bureau, the Grange, and the Farmer's Union?"

County Agent and Extension Specialist Meeting	Non-governmental farm organizations Meeting	
Yes	Yes	56
Yes	No	41
No	Yes	24
No	No	78

INTERVIEW NUMBER_____

Figure 3. Chart Used in Determining Communicative Sources of Information Used by Farmers in Securing Different Types of Information, Interstate Managerial Survey 1954

		PEOPLE FROM FARM ORGANI-ZATIONS	CO. AGENTS, VOC. AG. TEACHERS, & AG. COLL. REPRESENT-ATIVES	GOVERN-MENT PEOPLE	TRUCKERS, CUSTOM OP-ERATORS & ROUTE DRIVERS	NEIGHBORS & RELATIVES	PROFES-SIONAL FARM MANAGERS	BANKERS & LENDING AGENTS	DEALERS, SALESMEN, & BUYERS	DEMONSTRA-TIONS, MEETINGS, LECTURES	PUBLICA-TIONS OF EXP. STAT. & EXT. SERVICES	FARM MAGAZINES	PUBLICA-TIONS OF FARM ORGANI-ZATIONS	FORMAL SCHOOLS	MAIL AD-VERTISING	NEWS-PAPERS	RADIO	TELE-VISION	AUCTIONS
PRICES OF THINGS SOLD	PAST PRICES AND PRICE TRENDS																		
	CURRENT PRICES AND CHANGES IN PRICES																		
	PRICE OUTLOOK																		
PRICES OF THINGS BOUGHT	PAST PRICES AND THEIR TRENDS																		
	CURRENT PRICES AND CHANGES IN COSTS																		
	PRICE OUTLOOK																		
PRODUCTION FACTORS	EXISTING VARIETIES OF CROPS & LIVESTOCK																		
	EXISTING METHODS OF PRODUCING CROPS & LIVESTOCK																		
	CLIMATE, SOIL, AND DISEASE CONDITIONS																		
NEW DEVEL-OPMENTS	NEW INVENTIONS, DEVELOPMENTS, AND DISCOVERIES																		
HUMAN FACTORS	PEOPLE YOU HAVE TO DEAL WITH IN RUN-NING YOUR FARM																		
	PEOPLE WHOSE REAC-TIONS MAY BE IMPOR-TANT TO YOU IN RUN-NING YOUR FARM																		
POLITICAL, SOCIAL, RELIGIOUS FACTORS	CHANCES FOR DEPRES-SION OR PROSPERITY																		
	ACTIONS & ATTITUDES OF LOCAL INFORMAL GROUPS THAT MAY AFFECT YOUR FARM																		
	ACTIONS OF NON-GOVT GROUPS AFFECTING FARM-ING (E.G., FARM BUREAU, AMERICAN LEGION, ETC.)																		
	FEDERAL, STATE, AND LOCAL GOV'T ACTIONS AFFECTING FARMING																		

APPENDIX II

TABLES

Table 1

Relationship of Control Variables and Types of Information Considered Important by Farmers When Organizing and Operating Farms for Profit and Satisfaction: Summary of Chi-Square Tests, Michigan (Stratum 4 only)

Control Variable	In Connection with Organizing Farms		Operating Farms for Profit		Operating Farms for Family Satisfaction	
	df	x^2	df		df	x^2
Childhood on farm	10	9.15	10	3.89	10	10.44
Agricultural training in school	15	17.10	15	6.87	15	15.48
Last grade of school	25	16.22	25	12.58	25	17.10
Additional training related to ag.	5	4.49	4	.98	5	2.90
Kind of additional training	6	10.78	8	1.88	10	9.13
4-H or FFA member	10	5.75	8	3.66	10	4.85
Children in 4-H or FFA	5	4.41	4	5.30	5	4.67
Years farming on own	25	16.38	20	11.46	25	22.52
Experience out of farming	20	9.19	16	5.34	20	10.29
Kind of non-farm experience	8	11.16	8	3.81	10	3.96
Off-farm work	30	17.92	24	7.98	30	24.95
Proportion of gross inc. from farm	10	8.09	8	6.50	10	5.96
Age of respondent	30	16.45	24	8.26	30	21.25
State of family cycle	25	18.89	20	9.29	25	11.52
Number of dependents	20	10.65	16	9.78	20	11.14
Use of hired labor	10	6.46	8	4.41	10	6.01
Average gross farm income	15	10.24	12	15.52	15	13.32
Net worth	40	21.29	32	16.15	40	30.55
Total assets	15	8.42	12	4.90	15	15.97
Total debts	20	17.61	16	10.35	20	26.27
Ratio: debts to assets	10	16.58	8	6.95	10	6.48
Proportion rented	15	19.80	12	7.69	15	12.62
Total acres tilled	15	9.68	12	5.46	15	17.51
Type of farm	25	24.48	20	19.79	25	14.29
Imp. of types of info: Rank I	25	13.47	25	9.57	25	33.64
Methods of reaching conclusions	--	--	8	2.25	10	11.49
Method most natural	--	--	8	4.79	10	7.48
Meeting attendance	15	8.39	12	9.57	15	17.89

Table 2

Relationship of Control Variables and Relative Importance of Types of Information for Farmers: Summary of Chi-Square Tests, Michigan (Stratum 4 only)

Control Variable	df	Rank I	Rank II	Rank V
		chi-square		
Childhood on Farm	8	4.61	2.26	28.47
Agricultural training in school	12	8.42	13.66	9.83
Last grade of school	20	13.67	13.77	15.24
Additional training related to Agr.	4	9.74	1.20	5.18
Kind of additional training	8	8.19	6.22	8.14
4-H or FFA member	8	9.81	9.68	9.37
Children in 4-H or FFA	4	2.39	1.25	5.32
Years farming on own	20	20.25	19.22	18.02
Experience out of farming	20	25.06	12.80	14.55
Length of non-farm experience	16	13.63	11.62	11.46
Kind of non-farm experience	12	11.97	5.64	20.90
Work off-farm	36	26.62	29.32	25.19
Prop. of gross income from farm	8	5.64	10.29	8.09
Age of respondent	24	32.61	24.56	27.41
Stage in family cycle	20	20.34	21.78	16.42
No. of dependents	12	15.24	21.03	24.58
Use of hired labor	8	4.98	10.14	3.10
Average gross farm income	12	11.49	15.36	14.76
Net worth	32	38.18	40.96	30.75
Total assets	12	12.22	11.15	8.20
Total debts	16	14.71	22.07	20.77
Ratio: debts to assets	8	7.29	15.10	4.92
Proportion rented	12	7.13	24.65	12.45
Total acres tilled	12	9.46	9.64	13.17
Types of farm	20	24.73	27.19	15.05
Imp. of types of information				
Rank I	16	--	106.23	34.30
Rank II	16	103.13	--	40.08
Rank IV	16	34.30	46.08	--
Sum of additional difficulties	12	22.97	7.84	10.15
Methods of reading conclusions	8	10.74	3.73	17.22
Method most natural	8	24.74	7.40	8.95
Meeting attendance	12	22.71	10.84	7.36

Table 3

RELATIONSHIPS OF CONTROL VARIABLES AND COMMUNICATIVE SOURCES ON BOTH UNGROUPED AND GROUPED BASIS, FOR PRICE INFORMATION Michigan (Stratum 4 only).

	Sources ungrouped[1]					Sources grouped[2]					
Col.	df	Price	Prod.	New Tech.	Human	Inst.	df	Price	Prod.	New Tech.	Human	Inst.
grow up on farm	34	25.15	70.42	16.50	12.76	29.18	7	6.94	24.02	9.20	5.60	4.00
agriculture training	51	93.36	38.57	18.79	17.08	32.85	7	18.67	6.99	8.84	7.55	3.80
last grade of school	85	124.87	95.48	53.89	82.43	73.44	7	23.17	8.47	2.96	10.92	8.02
additional training	17	24.50	27.99	10.77	14.72	20.80	7	18.31	13.99	5.69	7.32	11.41
kind of additional training	34	30.65	12.98	9.69	11.25	9.92	7	14.12	11.20	9.69	7.25	6.30
belong to 4-H - FFA	34	88.33	52.48	13.33	15.23	28.32	7	12.37	7.79	5.43	5.41	6.70
children in FFA	17	39.66	35.07	10.91	23.28	10.62	7	15.73	17.12	9.49	11.19	2.83
years farming on own	85	130.97	82.98	25.57	94.85	41.09	7	6.23	7.60	3.59	10.14	8.70
out of farming	85	129.05	87.57	50.21	44.52	46.61	7	19.13	16.92	3.54	13.85	10.71
Out - how long	68	102.82	114.35	62.79	57.76	75.58	7	19.2	16.41	5.55	11.63	10.17
out - what did	51	26.72	56.06	13.87	46.63	32.70	7	9.87	19.56	8.98	5.61	5.75
do work off farm	119	83.97	72.17	24.44	77.74	49.02	7	7.21	6.89	6.61	11.48	7.29
proportion of gross inc.-farm	34	40.44	41.27	12.21	22.90	21.20	7	8.65	18.04	3.76	3.57	5.01
age	102	155.72	116.53	56.99	59.60	102.21	7	14.02	2.75	3.81	4.71	11.70
stage in family cycle	85	188.90	117.97	71.57	70.31	84.43	21	96.27	36.46	15.68	30.75	24.06
no. of dependents	68	97.18	52.80	29.80	68.35	76.84	7	14.20	3.12	5.70	7.24	6.85
use hired labor	34	72.46	30.22	21.61	30.42	37.84	7	19.46	5.82	2.28	11.59	6.57
average gross income	51	135.31	89.44	27.66	30.28	30.08	14	46.59	31.10	13.22	12.14	10.94
net worth	136	178.34	132.06	105.05	133.35	117.79	7	16.01	9.32	8.87	10.34	6.68
assets	48	62.15	23.34	25.83	8.12	19.14	7	7.41	6.76	1.96	4.10	5.45
total debts	68	147.25	64.57	34.60	41.86	66.73	14	32.78	32.70	26.65	14.41	27.49
ratio debts to assets	34	58.05	26.04	9.16	16.80	34.97	7	11.76	14.16	5.96	4.33	17.59
acres rented	51	72.97	43.29	19.92	44.40	40.18	14	13.40	16.74	8.47	9.53	12.86
total acres tilled	51	130.97	82.97	25.57	94.85	41.05	7	12.04	8.54	3.98	7.49	6.60
type of farm	102	136.94	125.55	101.75	92.95	69.21	14	19.11	17.11	13.72	22.55	8.46
Rank 1	85	109.92	83.29	62.82	128.21	69.59	28	38.33	33.62	31.25	14.39	18.92
Rank 2	85	141.02	110.18	50.90	157.94	73.88	28	64.56	43.51	30.81	46.64	32.78
Rank 5	85	116.76	126.45	51.93	169.90	89.69	28	48.89	42.27	28.92	32.34	31.80
sum of addi. diff.	51	105.51	80.79	25.54	43.63	34.40	14	49.84	43.97	14.07	16.29	11.19
ind.-ded.	34	23.43	41.39	11.35	13.37	22.13	7	5.69	4.14	5.32	3.14	5.90
most natural	34	38.21	26.74	14.94	15.72	27.04	7	6.72	7.66	7.00	4.02	12.24
attend organizations-meetings	51	114.87	99.50	34.16	54.57	37.78	7	41.31	25.26	15.64	10.19	5.19

[1]Eighteen communicative sources used.

[2]Eighteen communicative sources grouped into eight classifications. For description, see Chapter V.

Table 4

Relationship of Type of Information Secured From a Given Source to Different Characteristics of Farmer Respondents, for Eighteen Communicative Sources of Information, Michigan, (Stratum 4 only).

	df.	People from Farm Orgn.	Co. Agts, Vo. Ag. Teachers, Ag., College people	Government People	Truckers, Custom opers. & Route drivers	Neighbors & relatives	Professional Farm Managers	Bankers and Lending Agents	Dealers, Salesmen and Buyers	Demonstrations, Meetings, Lectures	Publs. of Experiment Sta. & Extension Serv.	Farm Magazines	Publications of Farm Organizations	Formal Schools	Mail Advertising	Newspapers	Radio	Television	Auctions
Childhood on farm	30	28.99	12.44	19.94	16.26	13.52	19.57	27.95	18.57	21.21	14.56	17.03	19.58	6.01	19.77	20.49	17.34	11.29	5.78
Agricultural train. in school	45	37.92	28.31	71.22	23.09	41.67	27.69	33.37	54.71	26.81	60.76	31.57	35.33	22.04	73.85	27.40	36.02	43.55	47.22
Last grade of school	75	48.10	47.60	64.72	55.79	52.69	64.95	81.90	73.22	56.84	53.09	56.85	52.61	44.76	69.89	62.17	64.64	42.79	46.18
Additional train. related to ag.	15	7.09	6.87	10.33	18.99	11.54	9.61	6.99	10.36	6.42	8.35	7.27	9.91	7.42	18.01	7.10	8.70	11.99	5.88
Kind of additional training	30	31.11	8.66	29.20	22.59	13.43	28.28	32.19	27.61	20.60	16.42	23.69	17.80	7.37	17.40	18.43	14.52	13.81	10.69
4-H or FFA member	30	34.78	32.09	21.35	35.64	19.92	42.19	14.11	31.44	12.12	17.30	12.98	23.65	27.48	37.11	22.49	21.33	31.39	37.75
Children in 4-H or FFA	15	12.36	2.92	14.40	10.38	12.03	5.53	13.86	11.31	11.73	4.13	6.30	8.01	7.33	17.79	5.14	8.83	7.92	8.78
Years farming on own	75	64.63	36.42	58.05	59.85	63.80	70.81	51.53	49.58	42.70	43.42	52.59	36.05	45.95	65.35	33.20	65.35	60.71	33.35
Experience out of farming	75	53.75	39.83	76.59	47.06	46.87	90.64	39.22	47.81	38.15	67.77	33.09	45.34	31.58	71.66	60.55	43.73	56.21	39.68
Length of non-farm experience	60	46.41	37.02	52.67	38.00	48.43	39.10	41.92	39.00	32.97	63.41	26.57	38.63	28.90	57.75	53.10	34.67	49.25	29.30
Kind of non-farm experience	45	28.78	20.22	26.16	32.84	32.22	17.69	24.74	19.12	25.04	32.37	35.16	39.39	40.93	40.26	20.23	18.40	34.80	24.58
Work off farm	105	70.70	69.11	85.08	62.64	73.16	142.80	75.72	74.97	70.90	61.87	54.79	77.92	9.50	48.35	71.32	68.96	51.66	60.78
Prop. of gross income from farm	30	17.46	13.82	25.86	19.72	14.78	16.54	25.90	22.77	19.86	17.07	19.85	16.61	7.00	12.99	25.40	25.45	17.59	14.28
Age of respondent	90	68.60	71.27	55.54	73.64	56.92	75.44	70.65	70.61	56.78	43.53	58.34	45.67	86.53	63.19	41.99	57.79	66.64	55.61
Stage in family cycle	75	53.23	72.28	95.74	68.06	52.64	33.87	71.79	50.74	62.69	72.24	54.98	58.64	20.93	71.25	47.43	62.18	41.16	29.57
Number of dependents	60	46.60	51.47	58.95	38.73	40.91	64.98	57.90	44.08	41.93	43.31	33.79	55.81	13.36	45.60	41.97	43.35	46.54	34.76
Use of hired labor	30	19.25	22.67	22.79	11.10	20.49	18.21	14.47	18.96	19.20	12.84	13.92	19.19	23.82	29.18	20.01	18.26	15.53	14.66
Average gross farm income	45	22.84	38.24	46.75	59.88	23.28	38.14	33.09	45.04	34.92	25.31	16.39	44.68	16.58	28.00	15.42	38.40	25.73	21.05
Net worth	120	71.20	65.44	131.41	101.83	62.01	133.08	88.04	88.28	78.08	77.98	65.82	70.58	71.51	97.56	87.62	57.07	86.70	69.73
Total assets	45	37.34	34.36	40.82	31.72	25.24	22.72	40.96	29.85	26.53	40.11	23.44	30.66	8.40	33.04	41.14	35.42	23.51	27.10
Total debts	60	42.48	35.48	48.73	43.49	28.00	44.79	43.95	52.15	43.09	52.92	45.26	35.64	47.66	46.30	46.47	56.79	37.02	34.16
Ration: debts to assets	30	13.47	25.39	31.95	30.66	24.16	16.48	14.14	21.58	27.82	22.62	15.88	19.88	9.21	24.47	19.43	27.69	17.28	19.83
Proportion rented	45	29.14	21.88	42.74	39.50	28.75	37.54	40.51	38.41	40.00	26.48	26.78	21.66	20.96	29.28	19.30	25.04	37.25	30.15
Total acres tilled	90	30.52	22.95	40.75	34.82	16.11	26.79	28.86	27.89	19.06	35.48	15.81	15.79	19.53	29.80	24.82	20.79	25.20	21.00
Types of farm	90	64.00	76.23	67.72	59.01	64.94	58.66	61.15	74.63	77.01	88.93	42.84	65.38	25.44	67.57	59.53	66.95	70.88	43.23
Imp. of types of information						Low	Highest												
Rank I	75	64.15	71.79	64.77	55.21	40.93	80.53	67.56	47.79	51.58	51.98	46.47	43.68	55.81	57.44	41.59	59.52	50.32	39.94
Rank II	75	47.34	52.01	64.41	59.90	38.49	67.75	81.96	53.08	46.39	60.06	53.61	51.96	44.68	54.50	57.16	65.45	51.68	48.48
Rank IV	75	47.41	44.53	52.90	50.70	37.78	79.08	54.22	46.77	36.79	58.78	39.44	35.63	66.37	42.51	53.62	49.13	53.02	59.06
Sum of additional difficulties	45	29.30	17.94	37.78	44.14	26.12	29.41	45.08	35.14	38.88	21.20	22.28	21.60	25.66	40.42	20.63	18.89	35.59	31.40
Methods of reaching conclusions	30	22.10	21.44	18.28	20.95	10.63	20.25	15.21	16.84	13.19	31.65	13.83	13.61	10.90	22.29	19.31	23.20	25.85	12.82
Method most natural	30	11.15	20.69	27.43	20.35	9.10	23.45	28.97	21.92	15.23	19.11	14.75	14.40	18.50	20.13	22.35	19.96	31.35	22.01
Meeting attendance	45	30.44	33.91	42.20	35.81	22.01	35.06	45.09	35.33	28.83	33.56	20.48	24.67	23.77	69.08	43.58	28.67	36.77	29.37

BIBLIOGRAPHY

ARTICLES:

Gowing, A. S., What People Need and Why, Extension Service Review, Vol. 22, No. 11, November 1951.

Hildebrand, G. H. and Partenheimer, E. J., Socioeconomic Characteristics of Innovators, Journal of Farm Economics, Vol. XL, No. 2, May 1958.

Johnson, G. L., Methodology for Studying Decision Making, Journal of Farm Economics, Vol. XXXIX, No. 3, December 1957.

Progress and Problems in Decision Making Studies (Interstate Managerial Survey), Journal of Farm Economics, Vol. XLVII, No. 5, December 1965.

Jensen, H. R., The Nature of the Study

Mayer, L. S., The Importance of Farm Studies

Smith, Joel, Some Problems of Method in the Interstate Managerial Survey

Johnson, G. L., The Friedman-Savage Utility Hypothesis in the Interstate Managerial Survey

Thomas, D. W., Sociological Aspects of the Decision Making Process

Nordin, L. S., Possible Implications of Decision Making Studies for Farm Management Teaching and Research

Moody, E. G., Possible Implications of the North Central Interstate Managerial Survey for Home and Home Development Problems

Smith, Joel, Michigan Farmers' Use of Radio and Newspaper Market News, Quarterly Bulletin, Michigan Agricultural Experiment Station, Vol. 36, No. 4, May 1954.

Wilkening, E. A., Sources of Information for Improved Farm Practices, Rural Sociology, Vol. 15, No. 4, March 1950.

BIBLIOGRAPHY

ARTICLES:

Cowing, A. G., What People Read and Why, Extension Service Review, Vol. 22, No. 11, November 1951.

Hildebrand, P. E. and Partenheimer, E. J., Socioeconomic Characteristics of Innovators, Journal of Farm Economics, Vol. XL, No. 2, May 1958.

Johnson, G. L., Methodology for Studying Decision Making, Journal of Farm Economics, Vol. XXXIX, No. 5, December 1957.

Progress and Problems in Decision Making Studies (Interstate Managerial Survey), Journal of Farm Economics, Vol. XXXVII, No. 5, December 1955.

Jensen, H. R., The Nature of the Study

Haver, C. B., The Universe of Farms Studied

Smith, Joel, Some Problems of Method in the Interstate Managerial Survey

Johnson, G. L., The Friedman-Savage Utility Hypothesis in the Interstate Managerial Survey

Thomas, D. W., Sociological Aspects of the Decision Making Process

Hardin, L. S., Possible Implications of Decision Making Studies for Farm Management Teaching and Research

Heady, E. O., Possible Implications of the North Central Interstate Managerial Survey for Farm and Home Development Problems

Smith, Joel, Michigan Farmers' Use of Radio and Newspaper Market News, Quarterly Bulletin, Michigan Agricultural Experiment Station, Vol. 38, No. 4, May 1956.

Wilkening, E. A., Sources of Information for Improved Farm Practices, Rural Sociology, Vol. 15, No. 1, March 1950.

BULLETINS:

Johnson, G. L., New Managerial Concepts and the Extension Service, Kentucky Agricultural Extension Service, Lexington, Publication 59, December 1952.

Johnson, G. L., Managerial Concepts for Agriculturalists, Kentucky Agricultural Experiment Station, Lexington, Bulletin 619, 1954.

Johnson, G. L., and Haver, C. B., Decision-Making Principles in Farm Management, Kentucky Agricultural Experiment Station, Lexington, Bulletin 593, 1953.

Johnson, G. L., and Haver, C. B., Agricultural Information Patterns and Decision-Making, Michigan Agricultural Experiment Station, East Lansing, Bulletin Manuscript, 1959.

Lionberger, H. F., Sources and Use of Farm and Home Information by Low-Income Farmers in Missouri, Missouri Agricultural Experiment Station, Columbia, Bulletin 472, 1951.

Nielson, J. and Bittner, R. F., Farm Practice Adoption in Michigan, Michigan Agricultural Experiment Station, East Lansing, Technical Bulletin 263, 1958.

North Central Rural Sociology Committee, How Farm People Accept New Ideas, Agricultural Extension Service, Iowa State College, Ames, Special Report 15, 1955.

Ross, J. E. and Bostian, L. R., Time Use Patterns and Communications Activities of Wisconsin Farm Families in Wintertime, Department of Agricultural Journalism, University of Wisconsin, Madison, Bulletin 28, 1958.

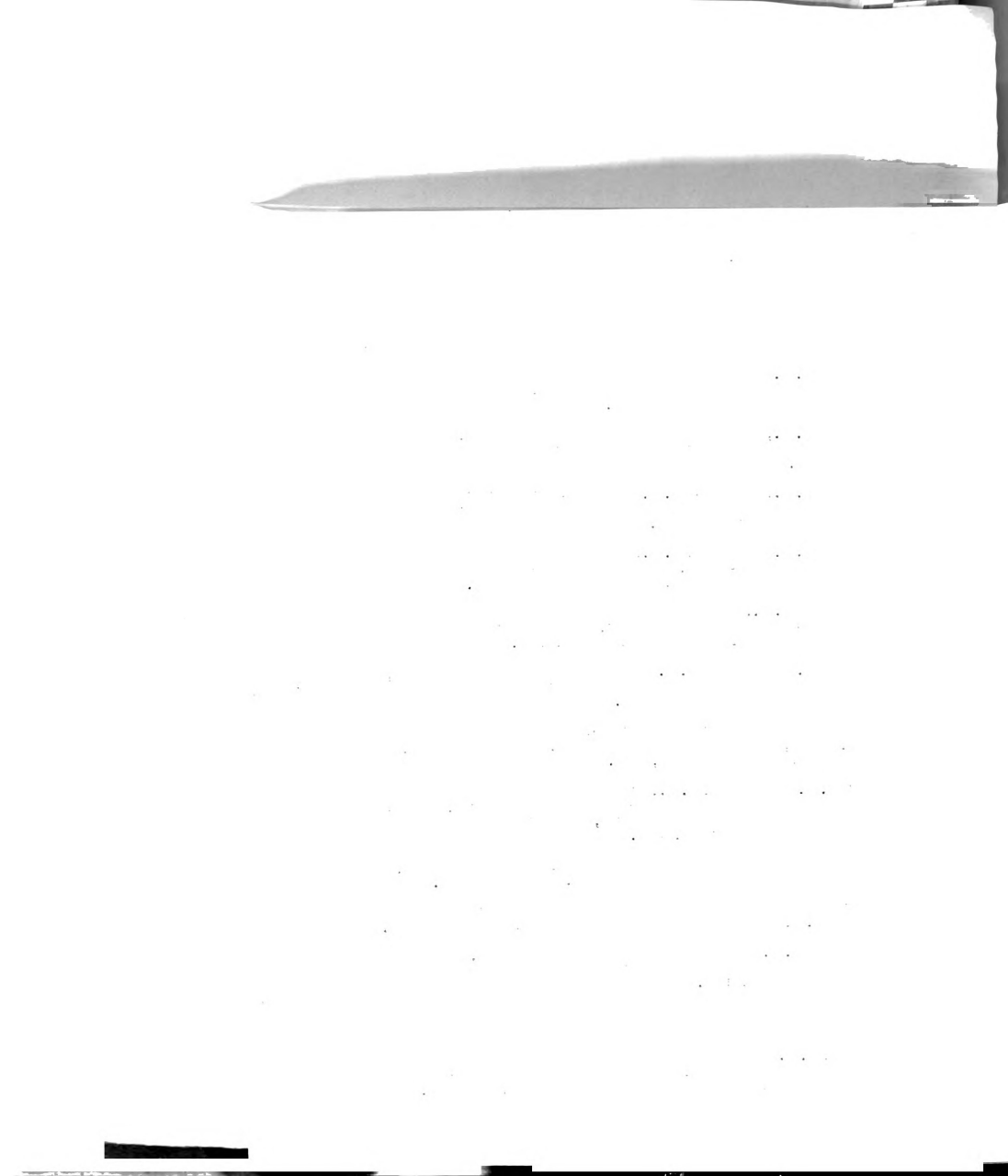
Statistical Laboratory of Iowa State College, InFARMation Please!, Wallaces" Farmer and Iowa Homestead, Des Moines, 1948.

Statistical Laboratory of Iowa State College, InFARMation Please! No. 2, Wallaces" Farmer and Iowa Homestead, Des Moines, 1952.

Wilkening, E. A., Acceptance of Improved Farm Practices, North Carolina Agricultural Experiment Station, Raleigh, Technical Bulletin 98, 1952.

MANUSCRIPTS:

Johnson, G. L., Handling Problems of Risk and Uncertainty in Farm Management Analysis, a contribution under R and MA Project 42, Kentucky Agricultural Experiment Station, Lexington.



King, C. E., A Study of the Sociological Research on the Diffusion and Adoption of New Farming Practices with Concomitant Relationships to the Elements and Processes of Social Systems, Unpublished paper, Department of Rural Sociology, Michigan State University, East Lansing, 1955.

Moe, E. O., Some "Principles" in the Acceptance of New Farm Practices, Unpublished paper, Department of Rural Sociology, Michigan State University, East Lansing, 1955.

O'Donnell, D. C., A Survey of Eight Studies Concerned with Sources of Information on Farm and Home Practices and the Relative Effectiveness of the Sources, Unpublished paper, Department of Sociology, North Carolina State College, Raleigh, 1952.

Partenheimer, E. J., Some Expectation Models Used by Selected Groups of Midwestern Farmers, Ph.D. Thesis, Department of Agricultural Economics, Michigan State University, 1959.

Special Surveys Division, Bureau of Agricultural Economics, The Extension Service of Vermont, United States Department of Agriculture, Washington, D.C., 1947.

MISCELLANEOUS:

Emery, F. E. and Oeser, O. A., Information Decision and Action, Melbourne University Press, Melbourne, Australia, 1958.

North Central Rural Sociology Committee, Bibliography of Research on Social Factors in the Adoption of Farm Practices, Iowa State College, Ames, 1956.

Proceedings of Conference on World Land Tenure Problems, Influencing Rural People: A Report of Workshops on Information Methods, University of Wisconsin, Madison, October 8 - November 17, 1951.