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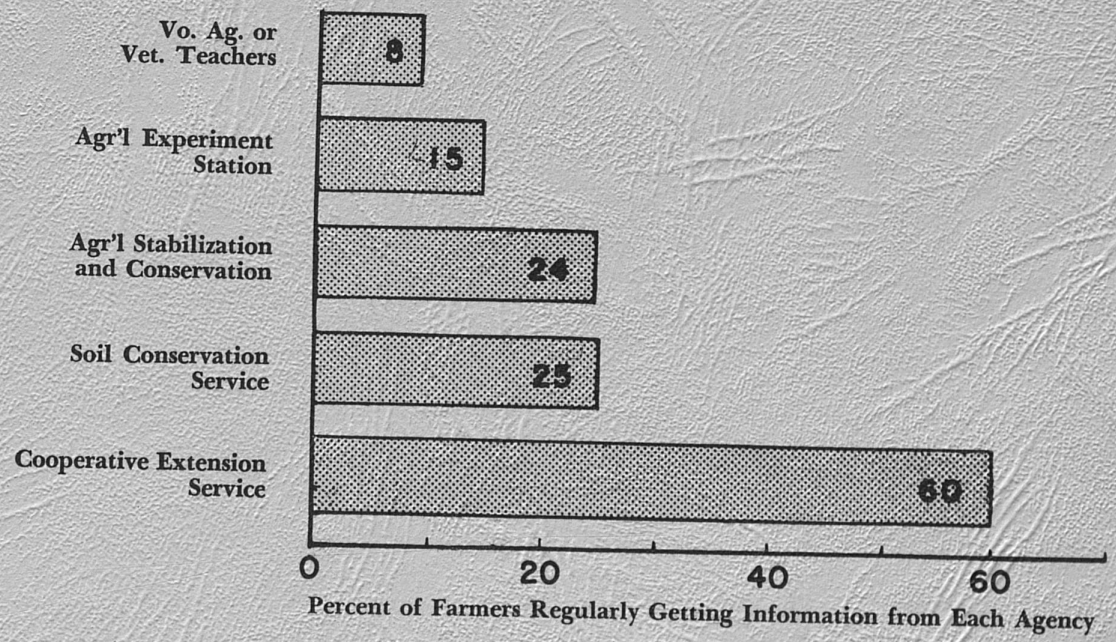

UNIVERSITY OF KENTUCKY
KENTUCKY AGRICULTURAL EXPERIMENT STATION
LEXINGTON

Progress Report 82 November 1959

AGRICULTURAL AGENCIES AS INFORMATION SOURCES FOR FARMERS IN A KENTUCKY COUNTY, 1950-1955

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E R R A T A

p. 10, par. 2, line 2: "with" should be "without."

p. 41, par. 2, line 6: "along" should be "alone."

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AGRICULTURAL AGENCIES AS INFORMATION SOURCES FOR FARMERS IN A KENTUCKY COUNTY, 1950-1955

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Introduction

Since the beginning of the effort to deal with agricultural problems through organized public action, the number of state and federal agencies directly serving farmers or having agricultural programs has grown to nearly a dozen.[2] When classified by primary purpose, these agencies are of two types: action agencies which have police or tax powers, or extend credit, for example, the Farmers Home Administration and the Agricultural Stabilization and Conservation Program; and nonaction or educational agencies which are concerned with research, demonstration, education, and counseling. Agency programs designed to serve one purpose often serve other purposes also. Thus, in establishing a pasture-building program an action agency will probably dispense much up-to-date information about pasture-building practices--a primary function of the educational agencies.

As an occupational group, farmers are doubtless unique in the number of public services designed to assist them in adapting to changing agricultural conditions. Yet much evidence indicates that farmers do not use agricultural agencies, although

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[1]The author is indebted to Thomas R. Ford for much editorial assistance.

[2]An agency is considered to be directly concerned with farming, the farm, or local areas if such is the focus of one or more of its programs. Agricultural agencies serving Kentucky farmers include the following: Agricultural Stabilization and Conservation, USDA; Bureau of Vocational Education, Kentucky; Cooperative Extension Service; Cooperative Farm Credit Banks; Department of Agriculture, Kentucky; Department of Conservation, Kentucky; Department of Economic Development, Kentucky; Farmers Home Administration, USDA; Forest Service, USDA; and, Soil Conservation Service, USDA.

objective appraisals show they need such assistance. How to narrow the gap between the availability of services and their use by farmers is a problem which concerns both agricultural agencies and local community leaders. With reference to this problem, this report is focused on differences among farm operators in the use of agricultural agencies as farm information sources.

Information concerning farmers' contacts with agricultural agencies was collected in 1950 and 1955 from farm operators in 12 neighborhoods in in Washington county, Kentucky.[3] In 1950, 393 farm operators were in these neighborhoods, but by 1955 the number operating farms had declined to 343. Of the latter only 285 had been in the survey neighborhoods in 1950.[4] In order that the analysis can be carried out in greater detail, this report is based on findings obtained from the 285 farmers interviewed twice; in most respects they are representative of the total numbers in the neighborhoods on each survey date.

Since the survey neighborhoods were not randomly selected, it cannot be claimed in any statistically meaningful way that the farmers surveyed are

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[3]For data from these surveys which pertain to the present report, see especially A. Lee Coleman and C. Paul Marsh, "Differential Communication Among Farmers in a Kentucky County." Rural Sociology, 20 (1955), 93-101; C. Paul Marsh and A. Lee Coleman, Communication and the Adoption of Recommended Farm Practices, Kentucky Agricultural Experiment Station, Progress Report 22, November 1954; and James N. Young and C. Paul Marsh, The Adoption of Recommended Farm Practices and Sources of Farmer Information, Kentucky Agricultural Experiment Station, Progress Report 40, October 1956.

[4]For a comparison of the farmers who had left, those who had come into the neighborhoods during the five year period, and those who remained, see Gordon DeJong and C. Milton Coughenour, "What's Happening to Kentucky Rural Neighborhoods?" Kentucky Agricultural Experiment Station, Kentucky Farm and Home Science, Summer 1958, Vol. 4, No. 3, pp.3, passim.

representative of all farmers in the county.[5] The neighborhoods were selected to represent the range of farming conditions in Washington county, which itself is typical of much of the outer Bluegrass economic area. Farmers in these neighborhoods face problems that are common throughout a wide area. This report is concerned more with relationships between the use of agricultural agencies and the personal and social characteristics of farmers than with precise numbers or proportions of farmers who exhibit certain characteristics or patterns of behavior. The general nature of these relationships is much the same for farmers in broad areas and thus can be studied despite the inadequacy of the sampling for some other purposes.

The general approach used in the analysis is that the farmer's contact with agricultural agencies depends on both the agency and the farmer and, also, that the relationship which develops between them is shaped and mediated by the characteristics of both and by the social and physical environment in which contact occurs. In this report contact with agricultural agencies is viewed as largely dependent on the personal and social characteristics of farmers. For present analytical purposes, agency characteristics and those of the society are taken as constants in the equation, and the importance of differences among agencies for contact with farmers is given only brief attention.

However, among the characteristics of agencies that affect the extent of contacts with farmers is the scope of the agency's program. Ordinarily, the more specialized the program the smaller will be the number of farmers in an area to whom the program applies. The applicability of a program is also

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[5]Use of the neighborhood as the sampling unit was dictated by the focus of the study, of which this is a part, on the influence of neighborhood norms in farmers' practice adoption decisions.

restricted whenever there are general qualifications, such as having served in the armed forces, for those using its services. For these reasons the primary agencies or organizations serving as sources of farm information in Washington county are the following:

Cooperative Extension Service

Farmers Home Administration (FHA)

Kentucky Agricultural Experiment Station (KAES)

Production Credit Association (PCA)

Production and Marketing Association (now Agricultural Stabilization and Conservation, ASC)

Soil Conservation Service (SCS)

Vocational Agriculture and/or Veterans' teachers

The Kentucky Agricultural Experiment Station is not an agricultural agency in the same direct sense as the others in this list, but it serves as an important farm information source through the annual Farm and Home Week, special field-day programs, and the direct distribution of printed materials and information on request. In this report the Experiment Station is classified as a nonaction agricultural agency.

Although data were obtained in both surveys on all these agencies so few farmers had said they had gotten farm information from the Production Credit Association that it is omitted from the analysis.

In the 1950 and 1955 surveys farmers were asked whether during the past two years they had obtained information, ideas, or help of any kind from each of the various agencies in any manner whether by mail, at meetings, or in person. Since the frequency, duration, spontaneity, and closeness of contacts may vary widely among those reporting some contact, the data provide only a minimal indication of the farmer's relationship to agricultural agencies. However, the regularity with which

farmers received at least some information from each agency can be determined by examining the responses on both surveys of the 285 farmers interviewed twice. For each agency three types of farmers can be identified:

Regular users--farmers reporting in both surveys that they had obtained information (at least once) from the agency during the past two years.

Irregular users--farmers reporting in only one of the two surveys that they had obtained information during the past two years.

Nonusers--farmers reporting in both surveys that they had not obtained information from the agency during the past two years.

With respect to farmers who differ in their patterns of agency utilization, several questions arise having practical as well as general sociological significance.

1. What proportion of the farmers fall into each utilization category for individual agencies?

2. Do farmers who are "regular users" have characteristics which distinguish them from the "irregular users" and the "nonusers," and to what extent can these characteristics produce the patterns of utilization?

3. To what extent do farmers who obtain information from one agency also obtain information from the other agencies?

4. To what extent do farmers who do not receive information "regularly" from any agency, those who receive information "regularly" from one or two agencies, and those who receive it "regularly" from three to five agencies differ in their personal and social characteristics?

5. Since for each agency the "irregular users" include those farmers who, as determined by their reports in 1950 and 1955, had stopped or started receiving information from the agency,

   (a) what is the average rate of turnover as reflected by the dropouts?

   (b) how do the dropouts differ from the "regular" users in their personal and social characteristics?

   (c) how do the new users differ from the "nonusers" in their personal and social characteristics?

6. With respect to the adoption of improved farm practices, what relationship exists between farmers' personal and social

characteristics, and their contact with agricultural agencies?

The remainder of this report presents data and interpretations relating to these questions.

Patterns of Utilization

According to the reports of farmers themselves as summarized in Table 1, the Cooperative Extension Service through the county agricultural agent provided information regularly to more farmers than any other agency (60 percent).[6] None of the farmers, however, received farm information regularly during this period from the Farmers Home Administration. Moreover, the Extension Service and Farmers Home Administration are at opposite poles with respect to the proportions of "nonusers" (10 percent and 90 percent, respectively). Except for the Extension Service, each agency has more "nonusers" or "irregular users" than "regular users."

Table 1.--Percentage distribution of farm operators by pattern of utilization of agricultural agencies, Washington county, 1950-1955

Agricultural Agency	All Farmers (Number)	Pattern of Utilization: Non Use	Irregular Use	Regular Use
		Percent		
Agricultural Extension Service	(285)	100	10	30	60
Agricultural Stabilization and Conservation Program	(285)	100	31	45	24
Farmers Home Administration .	(284)	100	90	10	0
Kentucky Agricultural Experiment Station	(283)	100	59	26	15
Soil Conservation Service	(285)	100	30	45	25
Vocational Agriculture or Veterans' Teachers	(284)	100	74	18	8

[6] These findings must be used cautiously in their general application since representativeness of the sample cannot be determined,

The proportion of farmers contacted provides another perspective from which to view these data. Thus, for example, over a period of time 90 percent of these farmers received information from the Extension Service, although only 60 percent had done so regularly.

In interpreting these findings it is best to consider carefully the information function of each agency and its position in the system of communications. Of the six agencies only the Extension Service and the Soil Conservation Service aim primarily to supply up-to-date farm information to all farmers desiring it. Of the two, the Extension Service may be expected to have the widest contacts owing to its broader purpose. Therefore, although the percentage of "regular users" of the county agent is noteworthy,[7] it is not surprising that this proportion is larger than that for any other agency. On the other hand, the percentage who regularly reported having obtained help from the Agricultural Experiment Station (15 percent) is somewhat surprising in view of the limited opportunities that farmers have to obtain information from this source. Although contacts with the Soil Conservation Service and the Agricultural Stabilization and Conservation agencies cannot be directly compared with

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[7]Although direct comparison with findings from other states is inadvisable the percentage of "regular users" of the county agent compares favorably to the percentage of farmers usually getting helpful information from printed extension (82 percent) and oral extension (55 percent) in Schuyler county, New York. See Helen C. Abell, Olaf F. Larson, and Elizabeth R. Dickerson, Communication of Agricultural Information in a South-Central New York County, Cornell University Agricultural Experiment Station, Mimeographed Bulletin 49, January, 1957. The percentage of "regular users" of the county agent in Washington county is far greater, as would be expected from the definition used, than the percentage using the county agent as a personal source of information as reported by studies in Missouri, New Hampshire, North Carolina, Texas, Vermont, and Wisconsin.

those in other counties or states, the proportion of "regular users" for each appear noteworthy.[8] The specialized purpose and limited applicability of the Farmers Home Administration program doubtless accounts for the restricted use of this agency as a source of information. Since so few farmers obtained information from this agency, the Farmers Home Administration as an information source is not considered further in this report.

Characteristics of Farmers Who "Regularly," "Irregularly," and "Never" Used Agencies

The information services of the agricultural agencies, except for vocational agriculture and veterans' teachers, are available to farmers with regard to need or station in life; but one expects that the more knowledgeable, perceptive, resourceful, active, and profit-oriented farmers in the community will exert the greatest effort to obtain these services. In societies where social position is predetermined by the accident of birth, personal qualities count for little in social achievement. In our society, however, social and economic achievement tend to be positively associated with acquired personal qualities, owing to the accessibility of formal education on one hand, and on the other, to the importance of the individual's abilities and values in making the short and long run decisions which are necessary for continued development.

Measures of socio-economic status, participation in formal organizations,

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[8] The percentage regularly using these two agencies is generally above the percentage of farmers in other states who are reported as "usually" obtaining information from these agencies. However, since the question asked Washington county farmers was more inclusive as to means of direct contact between a farmer and the agency than that asked farmers in other states, to what extent the proportions reflect differences in question wording rather than levels of contact cannot be determined precisely.

value of crops and products produced for sale, and level of practice-adoption in neighborhood of residence[9] reflect the economic and social position of the farmer, the favorability of the social climate in which he lives to the adoption of farm practices, and his scale of farming operations.[10] Measures of the farmer's education, age, attitude toward scientific farming, and years farming reflect the extent of personal farming experience, development of intellectual abilities, and motivation to seek "authoritative" sources. With chronological age and years of farming as exceptions, research in Kentucky and elsewhere has shown that the number and kinds of information sources used are directly associated with all these variables. Increasing chronological age inevitably brings with it a decrease in activity levels, in expectations of economic growth and/or of levels of living, willingness to assume risks, and the like. Moreover, as compared with younger farmers, older ones tend to have less formal education. Older farmers are less inclined to feel a need for and to seek up-to-date information. Years in farming is associated with age

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[9]Analysis of data pertaining to the level of practice adoption of farmers in these neighborhoods has led to the conclusion that there are group expectations or norms which guide the information-seeking and practice-adoption behavior of farmers. See especially, A. Lee Coleman and C. Paul Marsh, op. cit; C. Paul Marsh and A. Lee Coleman, "The Relation of Neighborhood of Residence to Adoption of Recommended Farm Practices," Rural Sociology 19, (1954), 385-389; and C. Paul Marsh and A. Lee Coleman, "Group Influences and Agricultural Innovations: Some Tentative Findings and Hypotheses." American Journal of Sociology, 61 (1956), 588-594.

[10]While the value of crops and products produced is commonly regarded as an index of socio-economic status it also reflects the scale of farming operations. In a study of 506 farmers in Magoffin, Powell, Trigg, Garrard, and Harrison counties in 1949 and 1950, the value of crops and products produced and scale of farming operations were shown to be highly related ($X^2 = 281.8$, $P < .001$; gamma, the relative probability of like and unlike orders, was $+ 0.64$).

and, for this reason as well as perhaps others, years farming tends to be negatively associated with information seeking.

It was to be expected that the same factors associated with the use of agencies at a particular time would also be associated with the frequency of use over an extended period of time. Put somewhat differently, one expects "regular," "irregular," and "nonuser" farmers to form a gradient with the "regular users" highest and the "nonusers" lowest when ranked according to measures of these personal and social characteristics (the order would be reversed for farmers ranked by age or years in farming). The expected relationships are shown schematically for each farmer characteristic in the first column of Table 2. Moreover, it is expected that the associations between the patterns of utilization and these characteristics of farmers will be stronger for the educational than for the action agencies.

The expected associations between patterns of utilization and these personal and social characteristics[11] are in large part confirmed for the surveyed operators. As indicated in Table 2, in only three cases is the direction of the actual relationship the reverse of the one predicted. Enthusiasm for this conclusion, however, should be tempered by a consideration of the degree of association. For this purpose two levels of association have been indicated in Table 2. Moderate association of information patterns for a particular agency is indicated by a single

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[11]For the purpose of this analysis little significance is attached to the classification of farmer characteristics as personal or economic and social. It is based largely on a judgment of whether the particular characteristic best represents the temperament, attitude, and mental ability of the farmer, or the social aspects of his position and extent of participation in the community, or the scale of his farming operations.

line under the appropriate pair of "Yes's," and strong association is indicated by a double underline.[12]

With these guides one can (1) compare the relative importance of each farmer characteristic with respect to receiving information from agricultural agencies generally, and (2) for each agency assess the characteristics of farmers that appear particularly related to information patterns with respect to that agency.

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[12]The choice of gamma (γ) as a measure of association was dictated by the following considerations: (1) several of the measures provide only ordinal measurement which suggests the use of a nonparametric measure of association; (2) since the 285 farm operators do not comprise a sample from any known universe, use of the more familiar sampling statistic, chi-square, raises the risk of misinterpretation; and (3) the coefficient of contingency, which is based on chi-square, is difficult to interpret. These difficulties are avoided by using gamma. See: Leo Goodman and William H. Kruskal, "Measures of Association for Cross-classifications." Journal of the American Statistical Association, 49 (1954), 732-764.

For present purposes the two levels of association indicated in Table 2 may be described as follows: Suppose that two of the farmers in this survey are chosen at random and classified as to their respective relationships to a particular agency and any given personal or social characteristic, e.g. as to relationship to Experiment Station and age. One underline means that for these two farmers the probability of the expected direction of association occurring is at least 30 percent greater than the probability of the reverse association occurring. A double underline means that the probability of the expected association occurring is at least 50 percent greater than the probability of the reverse association. Selection of these two breaking points and the respective descriptive adjectives used (moderate and strong) is purely arbitrary.

Table 2. --Expected and observed relationships between percentages of farmers with specified personal and social characteristics and percentages in information-user categories, by agency, Washington county, 1950 and 1955

Characteristics of Farmers	Expected Relationship		Conformity[a] of the relationship observed to that expected for:									
			Agricultural Extension Service		Ag. Stab. & Conser. Prog.		Ky. Agr. Expt. Sta.		Soil Conser. Serv.		Vog. Ag. and/or Vet. Teacher	
	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users
Personal Characteristics												
Age, 1950:												
60 or more years	Largest	Smallest										
40 to 59 years	↕	↕	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Less than 40 years	Smallest	Largest										
Attitude toward scientific farming, 1955												
Very favorable	Smallest	Largest										
Pretty favorable	↕	↕	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Not so favorable	Largest	Smallest										
Years completed in school												
9 or more	Smallest	Largest										
8	↕	↕	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Less than 8	Largest	Smallest										
Years in farming, 1950												
35 or more	Largest	Smallest										
20 to 34	↕	↕	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Less than 20	Smallest	Largest										

Table 2. --(Continued)

Characteristics of Farmers	Expected Relationship		Conformity[a] of the relationship observed to that except for:									
			Agricultural Extension Service		Ag. Stab. & Conser. Prog.		Ky. Agr. Expt. Sta.		Soil Conser. Serv.		Vog. Ag. and/or Vet. Teachers	
	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users
Social and Economic Characteristics												
Participation in formal organizations, 1950:												
High	Smallest	Largest										
Medium	↕	↕	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Low	Largest	Smallest										
Socio-economic status, 1950:												
High	Smallest	Largest										
Medium	↕	↕	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Low	Largest	Smallest										
Type of adoption-neighborhood:												
High	Smallest	Largest										
Medium	↕	↕	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Low	Largest	Smallest										
Value of products, 1950:												
$2,500 or more	Smallest	Largest										
$1,000 to $2,499	↕	↕	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Less than $1,000	Largest	Smallest										

[a] Based on detailed data shown in Appendix Tables 1 and 2. Explanation of entries: (a) a "yes" or "no" indicates only that the relationship between the percentages for the extreme categories of farmers for a particular farmer characteristic do or do not conform to the expected relationship; (b) one line under a "yes," "yes"--moderate associations--indicates a gamma of $\pm$ .30 or greater; (c) two under lines--strong associations--indicates a gamma of $\pm$ .50 or greater.

Table 2 indicates that the most important single farmer characteristic in agency utilization is socio-economic status, since the information patterns for every agency are moderately or strongly associated with this characteristic of farmers. The extent of the farmer's formal education is second in importance. Obtaining or not obtaining information from these agencies is least associated with the farmer's age, years in farming, and attitude toward scientific farming. (However, as we shall see, the farmer's age and attitude toward scientific farming are particularly important with regard to the number of agencies contacted regularly and practices adopted.)

Farmers' information patterns with respect to the Experiment Station, county Extension agent, and Soil Conservation Service agent are moderately to strongly associated with most of these personal and social characteristics. Farmers who "regularly" obtain information from these agencies thus may be described as the better-educated who possess the most favorable attitudes toward scientific farming, have a relatively high scale of farming operations and socio-economic status, and who participate heavily in formal organizations and live in neighborhoods which encouraged the adoption of improved farming practices.

Getting information from the Agricultural Stabilization and Conservation Program representatives is only moderately associated with education and socio-economic status. Since this agency is geared principally to action programs, less association between its use as a farm information source and these characteristics is to be expected. The fact that the better-educated and high status farmers more often receive information "regularly" from this agency probably reflects their greater participation in stabilization and conservation programs generally. Farm information is thus obtained as a byproduct of contact for other purposes.

The vocational agriculture and the veterans' teachers are used primarily by the young, better-educated, and higher status persons who have recently started farming. Of course, these agents are most accessible to the high school graduate and the young veteran. At the same time, the conditions which lead more high than low status farmers to use the other educational agencies also presumably operate in the same way for those who have the opportunity to obtain help from the vocational agriculture and veterans' teachers.

The "Regular Users" as the Agency's Clientele

Program planning to improve or extend an agency's services requires knowledge of clients' needs and characteristics. Such information aids identification of the clientele and points to factors which must be considered in planning. The farmers who receive information and help from an agricultural agency, especially the "regular users," may be regarded as the clientele of that agency. However, two facts should be pointed out: (1) the "regular users" as defined here are clients with respect to receiving farm information. An action agency's clientele would include those who receive monetary and other kinds of assistance. (2) Since random sampling procedures were not used in selecting respondents, the extent to which the findings apply generally cannot be determined in a percise way. With these facts in mind the reader is invited to examine the information in Table 3.

Table 3. -- For farm operators who "regularly" used agricultural agencies, percentages having certain characteristics*

Characteristic of Farm Operators	Agricultural Agency				
	County Agricultural Service	Agr. Stab. & Conser. Rep.	Ky. Agr. Expt. Sta.	Soil Conser. Ser. Agent	Voc. Ag. or Vet. Teachers
Personal Characteristics					
Less than 50 years of age, 1950:			79		91
Favorable toward scientific farming 1955:	75			90	
Completed 8 or more years of school:	67	72	93	76	87
Farming less than 20 years, 1950:			74		83
Social and Economic					
Medium to high participation informal organization, 1950:	77		91	81	
Medium to high Socio-economic status, 1950:	80	84	98	88	91
Residing in medium or high adoption neighborhoods	72		88	83	
Produced products worth $2,500 or more 1950:	53		79	65	

*Information given only for characteristics and agencies where "moderate" to "strong" association obtains.

Farmers who receive information and help from one agency may receive additional information from other agencies. The extent to which this occurred is reflected in the following figures:

Agency	Number of "regular users"	Percent also "regularly" using 2 or more of the other agencies
Agricultural Stabilization and Conservation	69	58
County Extension agent	171	34
Kentucky Agricultural Experiment Station	43	79
Soil Conservation Service	72	69
Vocational agriculture or veterans' teachers	23	87

Except for those using county Extension agent, the majority of the farmers who were clients of one agency also regularly received information from other agencies. This fact reflects the generalized nature of farmers' information-seeking tendencies and, depending on the particular agency, specialization in the agency's program.

The extent to which farmers who received information "regularly" from the SCS, KAES, ASC, or vocational agriculture or veterans' teachers also obtained information "regularly" from the county Extension agent is indicated by the following:

Agency	Percent also "regularly" receiving information from county agent
Agricultural Stabilization and Conservation (N = 69)	86
Kentucky Agricultural Experiment Station (N = 43)	95
Soil Conservation Service (N = 72)	97
Vocational agriculture or veterans' teachers (N = 23)	96

The county agent's clientele thus almost completely overlaps that for the other agencies. In fact, of the 184 farmers who obtained information "regularly" from one or more of these agencies, 171 also got information

"regularly" from the county Extension agent. The high degree of overlapping of the Extension Service's clientele with the clientele of these agencies reenforces the conclusion that as information sources, these agencies are used primarily as specialized farm information sources in conjunction with the county agent who is used as a general source of farm information.

Because his clientele overlap with those of the more specialized agencies, the county agent is in an important position to act as a coordinator of farm information programs. Moreover, in this case, at least, the structure of the clientele leads to the suggestion that, regardless of administrative policy, the county Extension agent must shoulder much of the responsibility for the contacts or lack of them that farmers have with agricultural agencies and for informing farmers of their opportunities for further specialized assistance through other agencies.[13]

One hundred and fifteen farmers--40 percent of the 285--obtained information "regularly" from one or more of the three more specialized U. S. Department of Agriculture agencies. In Fig. 1 the clienteles for each of these agencies and their interrelationships are shown pictorially. While the circles have no geographic reference, the size of each circle reflects the number of clients. The amount of overlapping of the clienteles is depicted by the overlapping of the circles. Of these 115 farmers, 54 (47 percent) were receiving information "regularly" from at least two of the three agencies, and 15 farmers (13 percent) were receiving information from all three.

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[13]This conclusion is supported by findings in a Missouri study which shows further that farmers who do not receive information from agricultural agencies tend to seek information from farmers having contact with the county agent. Herbert F. Lionberger, Information Seeking Habits and Characteristics of Farm Operators. Columbia: Missouri Agricultural Experiment Station, Res. Bul. 581, April, 1955.

The Number of Agencies "Regularly" Used

Although the farmer who "regularly" receives information from at least one of the agencies doubtless gets much needed assistance, those who receive information "regularly" from several agencies presumably have even more of an advantage. For this reason it is important to distinguish between those farmers who do not use any agency "regularly," those who use a few agencies "regularly," and those who use several agencies "regularly." While 36 percent of the 285 farmers may be regarded as "low" users of agricultural agencies since they had not received information regularly from any of the agencies, 44 percent may be regarded as "medium" having regularly received information from only one or two agencies. The remaining 20 percent received information regularly from three to five of these agencies and are classified as "high" users.

It is reasonable to suppose that the extent to which a farmer uses agricultural agencies for information purposes is dependent upon his regard for up-to-date information, and the circumstances of his farming situation which enable him continually to try out new ideas and make rapid adjustments. One therefore expects that the characteristics found to be associated with receiving information from each agency would also be associated with the extent to which information is received from all of them. This expectation is confirmed for these farmers as seen by the data in Appendix Table 3. In contrast to those who regularly use only one or two agricultural agencies or none at all, the "high" users are younger and have been farming a shorter period of time. "High" users also have had more formal schooling and possess a more favorable attitude toward scientific farming; they have a larger scale of farming operations, have higher socio-economic status, live in neighborhoods which encourage

the adoption of improved practices, and participate more extensively in all kinds of formal organizations.

The stake which agricultural agencies have in the formal education of those who farm deserves further comment. Ninety percent of those who have had at least some high school training obtained information regularly from one or more of these agencies, and nearly half were "high" users. By contrast half of those who had less than an eighth grade education did not regularly receive information from any of these agencies. Apparently the individual's early schooling is directly related to his appreciation of continued education throughout life. Moreover, as is commonly recognized the influence of formal education is also exhibited in the farmer's participation in formal organizations and his level of living. These characteristics further influence the patterns of contact with agricultural agencies. For these reasons the long-run trend to more formal schooling is one of the most dynamic elements in rural society. Unhappily, the population changes in these neighborhoods for the 5-year period 1950 to 1955 do not suggest that the farm operators who leave because of retirement or better opportunities elsewhere are being replaced by farmers having more formal schooling.[14]

Stability and Change in the Use of Agricultural Agencies, 1950 to 1955

In the foregoing sections the information obtained in 1950 and 1955 was used to classify farmers according to "regular," "irregular," and "nonuser" patterns of utilizing agricultural agencies. In the analysis it is assumed that this classification reflects different patterns of information-seeking behavior, and the attempt was made to account for these

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[14]Gordon De Jong and C. Milton Coughenour, op. cit.

differences among farmers. However, for purposes to be outlined below, it is useful to view these data as a way of describing changes in the total number of farmers using an agency from one time period to another, e.g., 1950 to 1955. To illustrate: in 1955, 62 percent of the 285 farmers said they had received information from the Soil Conservation Service during the 2 years prior to the survey as compared with only 33 percent who gave this response in 1950. Thus, the users of this agency nearly doubled between the first and the second survey.

These questions may be posed: (1) How many farmers, as determined by their replies, were receiving information both in 1950 and in 1955? These are represented by the "regular" users as reported earlier in Table 1. Invariably the "regular" users--in this case 25 percent--will number less than the smallest total using an agency for any year because farmers change their sources of information (and errors in collecting and recording the data).

(2) How many farmers were not receiving information in 1955 who had reported receiving information from the Soil Conservation Service agent in 1950? In one sense these farmers are dropouts so far as the Soil Conservation Service program is concerned. In this case there are 23 dropouts (8 percent of the 285 farmers).

(3) Of the 67 percent not being helped in 1950, how many still were not being helped in 1955? These are the "nonusers"--30 percent--as recorded earlier in Table 1.

(4) Finally, how many were being helped by the Soil Conservation Service in 1955 who were not receiving information from this agency in 1950? Those gained are represented by the difference (37 percent) between the percentage (25) who are "regular" users and the percentage (62) receiving information in 1955. Thus, on the basis of the numbers

receiving information at two time periods, the sample can be broken down into four groups for each agency--the "regular" users, the "nonusers," the "dropouts," and the "additions." The "dropouts" represent the gross loss between the two observation periods and the "additions" represent the gross gain and comparative size of the two figures determines whether there has been a net gain or loss. For these agencies gross and net gains or losses from the 1950 to the 1955 surveys are given in Table 4. In general, agencies

Table 4. --Percentage of farm operators reporting use of each agricultural agency in 1950 and 1955, and gross and net gain or loss in farmers using agency during this period

Agricultural Agency	Percent of Farmers Reporting Helpful Information Received		Gross Gain[1] 1950 to 1955 (Percent)	Gross Loss[2] 1950 to 1955 (Percent)	Net Gain or Loss 1950 to 1955 (Percent)
	1950	1955			
Agricultural Extension Service	72	79	19	12	+ 7
Agri. Stab. & Conser. Program	32	61	37	8	+29
Ky. Agr. Expt. Sta.	18	38	22	3	+19
Soil Conser. Service	33	62	37	8	+29
Voc. Agr. or Vet. Teachers	16	18	10	8	+ 2

[1]Percentage of farmers reporting in 1950 that they had not received information during the past two years from agency but reporting in 1955 that they had received information during the past two years.

[2]Percentage of farmers reporting in 1950 that they had received information during the past two years from agency but reporting in 1955 that they had not received information during the past two years.

with the largest percentage of gross gain also had the largest net gains in farmers receiving information. This is because, relative to the gross gains, there was little variation in the gross losses among these agencies.

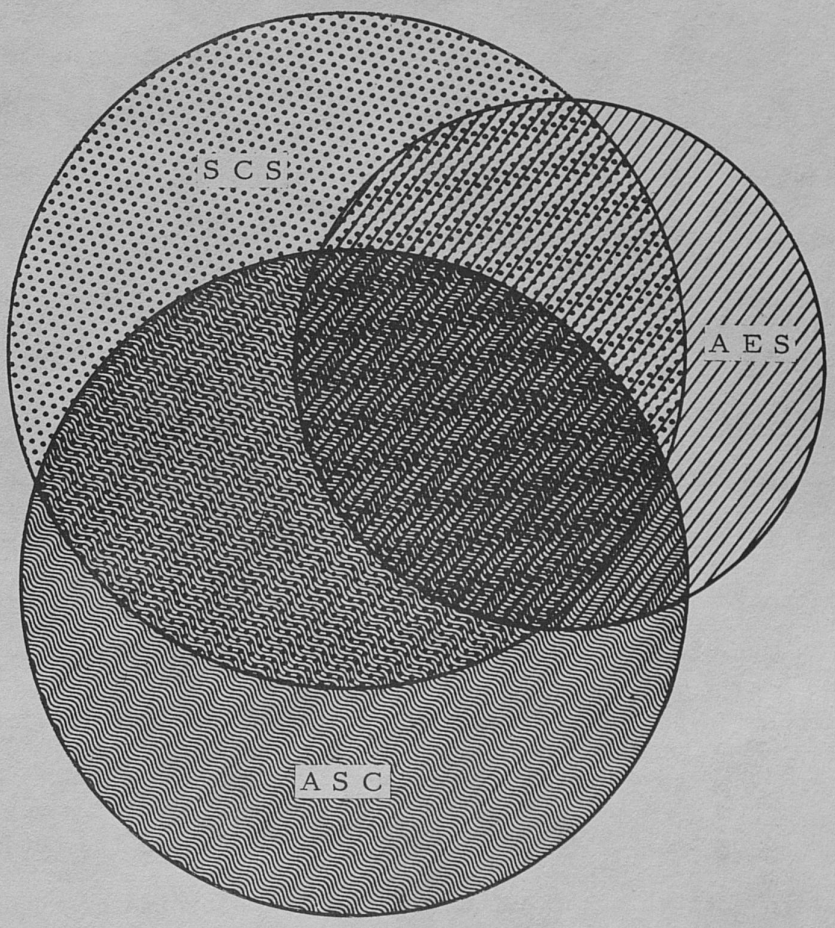
The gross loss, or dropout, may be used to estimate the average rate of dropout. This rate is important in that it specifies the rate of replacement necessary to maintain stability or growth. Since 5 years separate the two survey dates, for all agencies the dropout averaged less than 2 percent of all the farmers surveyed. This is a 2-year rather than an annual rate since each farmer was asked to report whether he had received information from an agency during the preceding 2-year period.

The foregoing rate of dropout is based on all farmers surveyed and presumably would apply to all operators in each agency's service area. However, since the total number of farm operators in the service area is only rarely known, a more useful figure is the rate based on the number of farmers "regularly" receiving information from the agency. An estimated rate of dropout can be computed by assuming that changes in the numbers receiving information and the number of dropouts were evenly distributed over the 5-year period. On this basis, except for the Agricultural Stabilization and Conservation program, the dropouts averaged somewhat more than 3 percent of those receiving information from an agency in any 2-year period. For farmers obtaining farm information from Agricultural Stabilization and Conservation representatives, the average rate of turnover for this period was approximately 10 percent. With the latter as an exception, the rate of turnover appears to be remarkably low. As a guide, however, this figure must be used cautiously. Whether it applies to other counties in the State remains to be demonstrated.

Factors Associated With Dropout - The factors associated with dropout may be determined in part by examining the differences in personal and social characteristics between the dropouts and those who did not drop out between 1950 and 1955, i.e., the "regular" users. While this will not provide a complete answer, it should tell us to what extent dropout may be related to certain general characteristics of the farmers themselves or of their situation, as opposed to factors that pertain to the agencies or to idiosyncratic aspects of farmers or their situations.

The data in Table 2 indicated that in 1950, for most agencies the "regular" users differed markedly from the "nonusers" in having completed more years of school, having higher socio-economic status scores, and having a higher value of products produced. The data which are presented in Appendix Table 4, indicate that the dropouts also tended to have less education and a lower socio-economic status than those who "regularly" received information from these agencies. Moreover, for most of the agencies the dropouts tended to have less favorable attitudes toward scientific farming and to participate less in formal organizations. It therefore appears that farmers having relatively little schooling and socio-economoc status, who are not so favorable toward scientific farming, and who participate infrequently in formal organizations are not only difficult to contact with agency programs but also tend to drop out of these programs more often once contact has been made. Presumably, the efforts of agencies to increase the favorability of farmers' attitudes toward scientific farming and increase their participation in formal organizations would be rewarded by both increasing and maintaining the number of farmers making contact with agencies.

Factors Associated With First Contact - Compared with "nonusers," farmers who began receiving information in 1955 tend to have had more



Agricultural Experiment Station

Soil Conservation Service

Agricultural Stabilization and Conservation

Area within each circle (and each sector) is proportional to the number of farmers using each agency (and each combination of agencies) as an information source.

Fig. 1. -- Overlap of Farm Information Clienteles of Three Agricultural Agencies

schooling and to participate more extensively in formal organizations (Appendix Table 5). Moreover, for particular agencies there are moderate associations between certain personal and social characteristics of farmers and whether they had begun using the agency or had not used it either in 1950 or 1955. In general, however, the lack of strong associations in this case suggests that these farmer characteristics do not reflect the main factors which influence farmers to begin using agencies as information sources. Perhaps the main influencing factors may be found in the farmer's idiosyncratic needs or interpersonal relations, specific situational factors, or in aspects of the agency's program.

With respect to most of their personal and social characteristics, both the dropouts and the new users are marginal, so to speak, to the "regular" and "nonuser" groups of farmers, respectively. Their marginality is attested to by their information-seeking behavior in the sense that they do not have established patterns either in receiving or in not receiving information regularly from agricultural agencies. This supports the view taken earlier in this report of the "dropouts" and "newusers" as "irregular" users of agricultural agencies.

The Number of Agencies "Regularly" Used and the Adoption of Farm Practices

There is an almost limitless number of identifiable farm practices, but the recommended practices of recent origin are the most crucial in the study of technological change. These represent the frontier of improved farming practices on which competitive advantages are either won or lost. The improved farming practices about which information was obtained in the two Washington county studies are:

Artificial breeding of dairy cows	Keeping an all-pullet flock
Keeping of farm records	Chick purchase in the State

Terracing and contouring	Bluestone-lime on tobacco beds
Planting ladino clover	Soil testing
Planting Kentucky 31 fescue	Phenothiazine drench for sheep
Calf vaccination	Phenothiazine with salt for sheep

For each practice applying to his farm the farmer was asked whether he had tried it.[15] The improved practice score (IPS) for each farmer is the percentage of practices applying to his farm that he had tried.

The farmer gains his initial information about most improved farming practices, certainly those listed above, from external sources such as other farmers, salesmen, agricultural agencies, newspapers, etc., rather than from his own personal farming experience. The practices that the farmer has tried thus may be viewed as dependent upon the relationship between the farmer and his sources of farm information. In this respect the trial or adoption of an improved practice becomes a product or output of this relationship. The determining conditions for this behavior system include certain characteristics of the farmer and his information sources, together with the information received. The principal analytical task is the identification of the determining conditions and how they are related to the output or adoption of practices. This is the focus of the following analysis.

In 1950, 3 out of 10 farmers had tried fewer than 30 percent of the practices applying to their farms while nearly 2 out of 10 farmers had tried 60 percent or more of the applicable practices. By 1955, however, the gradual adoption of improved practices was such that the proportions were

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[15] In these studies the criterion for determining whether practices had been tried varied between particular practices. Cf. Young and Marsh, op. cit., p. 2.

exactly reversed. Thus, for the study area as a whole there was a sharp increase in the use of improved practices from the first to the second survey. However, this increase did not occur for all these practices, nor did all farmers share in the improvement in technology. While certain practices, such as planting Kentucky 31 fescue and ladino clover, and soil testing, increased in use sharply during the 5-year period, there was little or no progress in the adoption of other practices, e.g., keeping farm records.[16] The practical problem is to identify the combinations of factors or conditions that led certain farmers to improve their farming technology while others, lacking these conditions, made no improvements (at least as measured by the adoption of these particular practices).

When farmers are classified according to their improved practice scores in 1950, individual progress is indicated by the percentage who had shifted to a higher practice adoption category by 1955. Thus, of the 122 farmers in 1950 who had tried less than 35 percent of the practices applying to their farms, 26 farmers (21 percent) had tried half or more of the practices by 1955. But 67 of these farmers (55 percent) still had not tried more than 35 percent of the applicable practices. Similarly, of every eight farmers in 1950 who had tried from 35 to 49 percent of the practices applying to their farms, 5 years later five of these farmers had tried half or more of these practices. There were a few farmers--7 percent of those with improved practice scores of 35 or higher in 1950--who were in a lower practice adoption category in 1955 than in 1950. Although these figures represent a crude measure of change in practices adopted, they nonetheless reflect overall trends.

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[16] See Young and Marsh, op. cit.

It is instructive to examine how individual differences in practices tried during the 5-year period are related to agricultural agencies used as sources of information. Table 5 shows that proportionately more farmers who "regularly" received information from an agency raised their improved practice ratings than those who were "irregular" users or "nonusers." Since many farmers obtained information from several sources, all sources from which information was received may contribute to the indicated association between change in improved practice scores and the pattern of utilization for each agency. This fact is particularly reflected in the proportion of nonusers for individual agencies who nonetheless raised their improved practice scores between 1950 and 1955. The absolute sizes of these increases are thus misleading, but the relative sizes of the differences probably reflect the relative contributions of the agencies to the increase in the adoption of <u>these</u> practices. Inasmuch as the improved practice score is based on a representative rather than a complete list of improved practices, there can be no assurance that the comparative influence of the different agencies would be the same for all such practices. Presumably, however, the comparative influences would be similar. These conclusions are further reinforced by the associations observed between farmers' improved practice scores in 1950 and their patterns of relationships to agricultural agencies (Appendix Table 6).

For the most part the study of the independent effects of each agency on practice adoption is impossible because farmers use many information sources. One feature of the use of these agencies as information sources, however, makes possible a limited assessment of the effect of the county Extension agent on practice adoption between 1950 and 1955. This possibility arises from the fact that a small number of farmers who received information from the county agent either had not received farm information from any other agency, or the influence of other agencies was relatively small.

Table 5. -- For all farmers whose improved practice scores in 1950 was less than 50, percentage distribution by change in score up to 1955 and by pattern of utilization of each agricultural agency.

Agency and Farmer's Utilization Pattern	All Farmers (Number)		Change in Improved Practice Score,** 1950 to 1955		
			Increase in IPS by one or more categories	No change in IPS category	Loss in IPS by one or more categories
Agricultural Extension Service					
Regular	(101)	100	55	39	6
Irregular	(81)	100	47	48	5
Never	(27)	100	33	60	7
Agricultural Stabilization and Conservation					
Regular	(37)	100	52	37	11
Irregular	(100)	100	51	44	5
Never	(72)	100	45	51	4
Kentucky Agricultural Experiment Station					
Regular	(9)		*	*	*
Irregular	(47)	100	79	17	4
Never	(151)	100	37	56	7
Soil Conservation Service					
Regular	(28)	100	71	25	4
Irregular	(99)	100	48	48	4
Never	(82)	100	41	50	9

Table 5 continued

Agency and Farmer's Utilization Pattern	All Farmers (Number)		Change in Improved Practice Score,** 1950 to 1955		
			Increase in IPS by one or more categories	No change in IPS category	Loss in IPS by one or more categories
Vocational Agriculture or Veterans' Teachers					
Regular	(7)		*	*	*
Irregular	(34)	100	59	35	6
Never	(167)	100	47	48	5
Number of Agencies "Regularly" Used					
High	(21)	100	62	28	10
Medium	(91)	100	56	40	4
Low	(97)	100	39	55	6

*Percentages not computed, owing to small number of cases.
**Improved practice score categories used are: Under 35, 35 to 49, 50 or more.

Of the farmers surveyed, 29 met the following conditions: (1) In 1950 they reported that during the preceding 2 years they had not received information, ideas, or help of any kind from any of the agricultural agencies. (2) In 1955 they reported either that they had not received information from any agency during the preceding 2 years or that they had received information only from the county agent or from the county agent and the Agricultural Stabilization and Conservation Program representatives. For present purposes we are interested in the differences in practices adopted between (a) the 18 farmers who, according to their reports in 1950 and 1955, had not received information or help from any agricultural agency, and (b) the 11 farmers who, while they were not receiving information from any agency during the 2 years prior to 1950, had received information or help from the county agent and/or the ASC representatives between 1950 and 1955.

In this case the direct effects of the Kentucky Agricultural Experiment Station, Soil Conservation Service, and the vocational or veterans' teachers are controlled by confining the analysis to only the farmers who, according to their reports, were not so influenced by these agencies. However, controlling the effects of the Agricultural Stabilization and Conservation representatives and other information sources, such as the mass media, presents additional problems. In this respect more detailed analysis leads to the conclusion that the influence of the ASC representatives on practices adopted by the 11 farmers in the test group is probably small in comparison to the county agent's influence.

To some extent both groups of farmers were using newspapers, magazines, radio, farm meetings, dealers and salesmen, and neighbors as sources of farm information in 1950 and 1955. Inasmuch as approximately the same proportions of farmers in both groups were using each source,

their effects on practice adoption presumably would be equal. Differences between the groups in practice adoption score thus must be primarily attributed to the information source in which they differ, i.e., the county agent, or to more favorable personal and social characteristics. However, both groups of farmers are distributed alike as to age, education, socio-economic status, participation in formal organizations, type of neighborhood of residence, and value of products. The use of the county agent by the 11 farmers therefore remains as the only known factor to which change in their practice adoption rates between 1950 and 1955 can be attributed.

In 1950 the 11 farmers (test group) and the 18 farmers (control group) had tried nearly equal percentages of practices; the median IPS was 32 for the test group and 29 for the control group.[17] However, by 1955 the median IPS for the test group was 39 as compared to 28 for the control group.[18] In 1950 no one in either group had tried as many as 50 percent of these practices; but by 1955 3 of the 11 in the group receiving information from the county agent had tried at least 50 percent of these practices as compared to only 1 of the 18 not being helped. Although there was little or no improvement in practices tried by the 18 "nonusers," marked improvement occurred among those who began receiving information from the county agent.

That the agricultural agencies--individually and collectively--influence change in farming practice is thus demonstrated by systematic as well as daily observation. Yet this force is felt directly only by those having contact with the agencies. Moreover, contact by itself does not insure adoption. Not only do contacts differ in frequency and quality but also

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[17] $X^2 = 0.110$, $P < .80$

[18] $X^2 = 3.599$, $P < .10$

farmers' personal and social characteristics affect the extent of contact and the use made of the information once it is received. (The extent to which contact with agricultural agencies is affected by differences in farmers' (personal and social characteristics has been indicated in earlier sections of this report; the importance of these characteristics for practice adoption is indicated by the data presented in Appendix Table 7.) While agricultural agencies together with other information sources contribute the major portion of new ideas, advice, and emotional support in practice adoption, several other questions remain to be answered. (a) What personal and social characteristics bring about contact with agencies? (b) What characteristics function to translate the ideas received into farm practices? (c) Does each personal and social characteristic function both ways or in one way only?

At present wholly satisfactory answers to these questions cannot be made. However, some insights are provided by analyzing the partial associations between practice adoption rate and farmers' personal and social characteristics while holding constant the number of agencies contacted regularly.[19] While it does not appear practicable to present this analysis in detail here, the data seem to support the following conclusions:

(1) The measures of attitude toward scientific farming, years in farming, and participation in formal social organizations indicate attitudes and behavioral patterns that tend to

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[19] In its most complete form this method of analysis, which has been developed within recent years by Paul F. Lazarsfeld, Patricia Kendall, Herbert Simon, Herman Wold, and others, is presented in Herbert Hyman, Survey Design and Analysis, Glencoe: Free Press, 1955, Ch. 5, 6, and 7.

determine the number of agricultural agencies contacted and through these contacts the percentage of applicable practices tried. In other words, the more favorable farmers' attitudes are toward scientific farming, the more they participate in formal organizations generally; and the less time they have been in farming, the more agencies they contact and, subsequently, the more practices they try on their farms.

(2) Differences in age, scale of farming, participation in formal organizations, level of living, and attitude toward scientific farming set favorable and unfavorable conditions for the translation of information received from agricultural agencies into actual practice. The most favorable conditions for close associations between improved practice score and member of agencies contacted regularly exist when the farmer has favorable attitudes toward scientific farming ("pretty favorable" or "very favorable") is less than 50 years of age, produced products worth $2,500 or more, had high participation in formal organizations, and a high socio-economic status score. Years of school completed and years in farming are relatively unimportant as factors which differentiate favorable and unfavorable conditions for the association between practice adoption score and number of agricultural agencies contacted.

Implications for a Strategy of Technological Change

This report has been focused on the interrelations among (1) farmers' personal and social characteristics, (2) their patterns of relationship to agricultural agencies, and (3) the adoption of improved practices. The primary contribution of the study has been to indicate the extent to which certain general hypotheses and findings apply to farmers in one Kentucky

county. The study has a secondary aim of attempting to take a short step forward in the development of scientific knowledge by suggesting some of the alternative functions that farmers' personal and social characteristics play in the adoption process. The study may thus serve to broaden the understanding of practice adoption and to increase the confidence with which general research findings can be applied to practical problems in Kentucky. One practical problem which merits further attention is the development of strategy for inducing technological change.

The consideration that can be given in this report to the development of strategy for agricultural agencies is of necessity both general in form and limited in scope. The discussion must be general so far as the ideas developed have value for more than one agency since satisfactory strategies in their details will differ from agency to agency. It is limited, moreover, both with respect to focus and to the range of materials considered. Consistent with the report as a whole, the consideration of implications for strategy is focused primarily on problems of strategy for educational agencies, such as the Agricultural Extension Service.

Given the goal of technological change, from the nonaction agency's standpoint, a first step in educational programming is to assess the relative strategic value of farmers' personal and social characteristics. In this assessment consideration must be given to two major factors: (1) the relation of each characteristic to others in the adoption process. (Does the characteristic influence adoption directly or is its influence indirect--through other characteristics?) (2) The responsiveness of each characteristic to influence, especially to the kinds that are within the province of educational agencies. (Is the characteristic relatively

responsive or unresponsive to the operations of agricultural agencies?)

It should be recognized that whether a characteristic provides a direct or indirect means of access to the goal depends on what the goal is. For example, attitude toward scientific farming may be classified as only indirect in its functional relation to practice adoption as an end sought by agricultural agencies. If, by contrast, contact with agricultural agencies is the end sought, then the evidence from this study would indicate that attitude toward scientific farming functions as a direct means of access. Similarly, the ease or difficulty of changing personal and social characteristics depends on how deeply ingrained the trait may be in the individual and also upon the types of influence or action the agency may bring to bear. For example, place of residence is relatively unresponsive to the typical programs of nonaction agencies, but it may be quite responsive to certain action programs such as those of the Farmers Home Administration.

Using these criteria, farmers' personal and social characteristics may be classified for nonaction agency strategic purposes as follows;

	Relatively responsive directly to nonaction agency programs	Relatively unresponsive to nonaction agency programs or only indirectly so
Providing <u>direct</u> access to adoption	1. Knowledge about and techniques of using improved practices	1. Applying the practice on the farmers's farm
Providing <u>indirect</u> access to adoption	1. Attitude toward scientific farming 2. Participation in "within agency" formal organizations 3. Level of living 4. Problem solving and communication skills, etc. . . .	1. Chronological age 2. Investment capital 3. Participation in "outside agency" formal organizations, etc. 4. Formal education etc. . . .

The farmers' personal and social characteristics listed above should not be taken as either complete or unalterable. Further research doubtless will indicate that certain of these characteristics should be omitted from consideration and that others should be added. Moreover, individual agencies may find that a somewhat different assignment is more appropriate for their purposes.

Program planners will recognize that these are only two of the factors which must be considered in determining the strategic value of personal and social characteristics. Relative program costs for influencing the characteristics and the "triggering" function of each characteristic in the adoption process are also important. In effect each factor adds another dimension to the classification.[20] However, further development here does not seem warranted.

Since, for purposes of strategy, characteristics that are relatively responsive to agency programs have the greatest value, most attention is given to those listed in the left-hand column. In this respect, of the five farmer characteristics listed, only knowledge about and techniques of using improved practices provide direct access to adoption. To the extent that practice adoption is a goal of nonaction agencies, the attention traditionally given to developing improved techniques of transmitting up-to-date information to farmers is well

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[20] The interested reader may wish to examine the following publications in this area of research which discuss the implications of research findings for educational agency programming. Herbert F. Lionberger, Information Seeking Habits and Characteristics of Farm Operators. Columbia, Missouri; Missouri Agricultural Experiment Station, Research Bulletin 581, April, 1955; F. E. Emery and O. A. Oeser, Information, Decision and Action. New York; Cambridge University Press, 1958.

deserved. Those interested in this problem may wish to refer to selected articles in the Bibliography of Research on: Social Factors In the Adoption of Farm Practices.[21]

Agricultural agencies, however, have hardly begun to recognize the strategic value of those personal and social characteristics that provide "indirect access" to adoption and are "relatively responsive" to agency programs. Besides these characteristics, this category should also include the basic conceptual skills that are normally learned in school but not necessarily there along. Among these are skills in problem solving and communication. The development of attitude and mental ability appears to increase the farmer's motivation to contact agricultural agencies, as well as other information sources, and to facilitate the receiving, interpreting, decision-making, and adaptive processes that intervene between contact with agencies and application of technology on the farm. It seems evident that the development of these attitudes and abilities must not be left to the schooling of youth or to chance but must be made an increasingly important part of the adult educational programs of nonaction agencies.

For present purposes farmers' participation in formal organizations might best be separated into participation in organizations sponsored by agricultural agencies themselves and participation in other organizations. It would be surprising, indeed, to find that agents could more readily encourage participation in organizations not sponsored by the agency than in sponsored organizations. Since it is often their primary purpose, the important function that agency organizations perform in the transmission of new ideas is obvious. Perhaps less often recognized is the equally important function other types of organizations perform for farmers in

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[21] Ames, Iowa, Iowa State College: Second Edition, March, 1959

facilitating the exchange of personal experiences and in the provision of emotional support in decision-making.

However, a comprehensive strategy of change as it applies both to local areas and to individual farmers will encompass educational, action, and other local agencies and organizations. This principle has been recognized in the establishment of Rural Development programs. The need for an inclusive strategy in promoting practice adoption is indicated in this study by the interrelation of factors in the adoption process and their differential responsiveness to agency programs. The extent to which agencies and organizations are presently joined in the adoption process is indicated in part by their different functions in this process and by the overlapping of clienteles. Certainly the goal of a more effective strategy for change can be advanced as research makes progress in discovering how much and in what ways each factor contributes to adoption.

It seems wise to conclude these general and brief observations regarding a strategy of technological change by recalling the role of technology in society. For modern society technology provides the means to the satisfaction of basic personal and societal needs. In a growing and competitive society, changes in technology are essential to the continued satisfaction of the more basic needs. In rationally developing a strategy, technological change must be taken as the immediate objective in view, and the relevant factors must be viewed primarily in terms of their contributions to attaining this objective. However, the strategist must not assume that technological change is the "final" end in itself. Such an inversion of means and ends would lead to disaster for the agency and ultimately the society. In practice this means that there are limits, which are quite real although poorly defined, past which "change agents" cannot or should not go in making use of the resources at their command in the interest of promoting technological change.

Appendix Table 1.--Percentages of farmers with specified characteristics who were "nonusers" and "regular users" of agricultural agencies, Washington county, 1950 and 1955

Characteristics of Farm Operators	Number of Farmers	Agricultural Extension Service		Agricultural Stabilization & Conservation Program		Kentucky Agricultural Experiment Station		Soil Conservation Service Agent		Vocational Agriculture or Veterans' Teachers	
		Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	None Users	Regular Users
		Percent									
Personal Characteristics											
Age, 1950:											
60 or more	65	11	42	43	15	65	5	40	15	85	3
40 to 59	130	9	62	30	25	67	12	30	23	83	2
Less than 40	90	9	70	53	29	44	28	23	36	54	21
Attitude toward scientific farming, 1955											
Very favorable	80	5	80	30	31	46	24	23	45	70	6
Pretty favorable	114	11	56	30	30	60	15	31	25	75	10
Not so favorable	91	11	47	33	11	69	8	36	8	75	8
Years completed in school, 1950:											
9 or more	67	2	88	18	40	25	43	10	52	57	21
8	87	7	63	26	26	59	13	29	23	72	7
Less than 8	131	15	44	41	15	78	2	41	13	84	2
Years in farming, 1950:											
35 or more	68	13	40	41	13	72	6	34	19	88	3
20 to 34	81	5	65	26	27	66	9	33	17	73	3
Less than 20	131	11	67	29	27	50	24	27	33	66	15
Social and Economic Characteristics											
Participation in formal organizations, 1950:											
High	67	5	82	31	37	39	33	16	46	74	9
Medium	113	4	68	23	30	57	15	22	24	65	11
Low	104	18	38	38	10	75	4	47	14	84	5

Appendix Table 1.--(Continued)

Characteristic of Farm Operators	Number of Farmers	Agricultural Extension Service		Agricultural Stabilization & Conservation Program		Kentucky Agricultural Experiment Station		Soil Conservation Service Agent		Vocational Agriculture, or Veterans' Teachers	
		Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users	Non-Users	Regular Users
		Percent									
Social and Economic Characteristics (Continued)											
Socio-economic status 1950:											
High	91	1	82	26	40	34	35	15	52	64	17
Medium	95	7	65	21	23	57	11	27	17	72	6
Low	99	19	34	44	11	85	1	47	9	86	2
Type of adoption neighborhood, 1950:											
High	67	3	79	34	37	41	34	16	49	73	9
Medium	107	8	65	31	24	43	14	34	25	69	9
Low	111	14	43	29	16	85	5	35	11	79	7
Value of products, 1950:											
$2,500 or more	111	4	81	32	33	39	31	20	42	74	8
$1,000 to $2,499	12	10	55	24	24	66	7	32	20	71	9
Less than $1,000	52	21	29	46	6	87	2	48	2	81	6

Appendix Table 2. --Associations between patterns or receiving or not receiving information from agricultural agencies and farmers' personal and social characteristics Washington county, Kentucky, 1950 and 1955*

Characteristics of Farm Operators	Agricultural Agency				
	Agricultural Extension Service	Agricultural Stabilization and Conservation Program	Kentucky Agricultural Experiment Station	Soil Conservation Service	Vocational Agriculture or Veterans' Teachers
Personal Characteristics:					
Age, 1950	-.23	-.18	-.32	-.22	-.47
Attitude toward scientific farming, 1955	.36	.17	.29	.35	.05
Years completed in school	.56	.36	.63	.48	.44
Years farming, 1950	-.27	-.16	-.35	-.18	-.33
Social and Economic Characteristics:					
Participation in formal organizations, 1950	.56	.27	.46	.45	.20
Socio-economic status, 1950	.60	.35	.64	.53	.38
Type of adoption neighborhood of residence	.45	.10	.57	.36	.12
Value of crops and products, 1950	.58	.23	.59	.46	.07

*When farmers are rank-ordered both as to the regularity with which they obtain information from a particular agency -- "never," "irregularly," and "regularly"-and as to any characteristic, a positive gamma (γ) tells how much more probable it is for farmers to be ranked the same way in both rank orders than it is for them to be ranked differently. A negative gamma tells how much more probable it is for the two rank orders of farmers, e.g. age and regularity of obtaining information, to be different rather than the same. Limits of the coefficient gamma are -1 and +1. The more technically minded reader may wish to refer to the original source: Leo Goodman and William H. Kruskal, op. cit.

Appendix Table 3. -- Percentage distribution of farmers by personal and social characteristics and the number of agricultural agencies from which they "regularly" obtain information, Washington county, 1950 and 1955

Characteristics of Farm Operator	Number of Farmers	Number of Agricultural Agencies "Regularly" Used			Association (gamma)
		None	1-2	3-4	
		Percent			
Personal Characteristics					
Age, 1950:					
60 or more	65	55	34	11	
40 to 59	130	32	51	17	-.35
Less than 40	90	26	42	32	
Attitude toward scientific farming, 1955:					
Very favorable	80	18	46	36	
Pretty favorable	114	36	44	20	..44
Not so favorable	91	50	43	7	
Years completed in school, 1950:					
9 or more	67	9	42	49	
8	87	32	50	18	.59
Less than 8	131	51	42	7	
Years in farming, 1950:					
35 or more	68	57	33	10	
20 to 34	81	29	56	15	-.35
Less than 20	131	28	44	28	

Appendix Table 3 continued

Characteristics of Farm Operator	Number of Farmers	Number of Agricultural Agencies "Regularly" Used			Association (gamma)
		None	1-2	3-4	
		Percent			
Social and Economic Characteristics					
Participation in formal organizations, 1950:					
High	67	15	43	42	
Medium	113	27	54	19	.68
Low	104	57	34	9	
Socio-economic status, 1950:					
High	91	14	41	45	
Medium	95	29	56	15	.64
Low	99	61	36	3	
Types of adoption neighborhood, 1950:					
High	67	16	45	39	
Medium	107	29	50	21	.64
Low	111	53	38	9	
Value of products, 1950:					
$2,500 or more	111	14	54	32	
$1,000 to 2,499	121	41	41	18	.58
Less than $1,000	52	67	31	2	

Appendix Table 4.--Percentage distribution of farmers using agricultural agencies in 1950 by information-use category and personal and social characteristics, Washington county
(Part I)

Characteristic of Farm Operator	Use of Agricultural Extension Service			Use of Agricultural Stabilization and Conservation Program			Use of Kentucky Agricultural Experiment Station		
	No. of Farmers	Dropouts	Regular Users	No. of Farmers	Dropouts	Regular Users	No. of Farmers	Dropouts	Regular Users
		Percent			Percent			Percent	
Personal Characteristics									
Age, 1950:									
60 or more	(41)	34	66	(17)	41	59	(4)	-	-
40 to 59	(95)	15	85	(41)	19	81	(18)	17	83
Less than 40	(69)	9	91	(33)	21	79	(30)	17	83
Attitude toward scientific farming, 1955:									
Very favorable	(69)	7	93	(30)	17	83	(24)	21	79
Pretty favorable	(76)	16	84	(41)	17	83	(19)	11	89
Not so favorable	(60)	28	72	(20)	50	50	(9)	-	-
Years completed in school:									
9 or more	(63)	6	94	(31)	13	87	(32)	9	91
8	(63)	13	87	(29)	21	79	(15)	27	73
Less than 8	(79)	28	72	(31)	39	61	(5)	-	-
Years in farming, 1950:									
40 or more	(31)	36	64	(12)	-	-	(3)	-	-
20 to 39	(72)	17	83	(32)	19	81	(10)	-	-
Less than 20	(99)	11	89	(44)	20	80	(37)	16	84
Social and Economic Characteristics									
Participation in formal organizations, 1950									
High	(59)	7	93	(29)	14	86	(26)	15	85
Medium	(90)	14	86	(41)	17	83	(21)	19	81
Low	(56)	30	70	(21)	52	48	(5)	-	-

Appendix Table 4. --(Continued)
(Part I)

Characteristic of Farm Operator	Use of Agricultural Extension Service			Use of Agricultural Stabilization and Conservation Program			Use of Kentucky Agricultural Experiment Station		
	No. of Farmers	Dropouts	Regular Users	No. of Farmers	Dropouts	Regular Users	No. of Farmers	Dropouts	Regular Users
		Percent			Percent			Percent	
Socio-economic status, 1950:									
High	(86)	13	87	(42)	14	86	(35)	9	91
Medium	(70)	11	89	(31)	29	71	(14)	-	-
Low	(49)	31	69	(18)	39	61	(3)	-	-
Type of adoption neighborhood									
High	(61)	13	87	(30)	17	83	(25)	8	92
Medium	(81)	14	86	(35)	26	74	(20)	25	75
Low	(63)	24	76	(26)	31	69	(7)	-	-
Value of products, 1950:									
$2,500 or more	(100)	10	90	(46)	20	80	(39)	13	87
$1,000 to $2,499	(79)	17	83	(39)	26	74	(12)	-	-
Less than $1,000	(25)	40	60	(6)	-	-	(-1)	-	-

Appendix Table 4. --Percentage distribution of farmers using agricultural agencies in 1950 by information-use category and personal and social characteristics, Washington county
(Part II)

Characteristic of Farm Operator	Use of Soil Conservation Service			Use of Vocational Agriculture or Veterans' Teachers		
	No. of Farmers	Dropouts	Regular Users	No. of Farmers	Dropouts	Regular Users
		Percent			Percent	
Personal Characteristics						
Age, 1950:						
60 or more	(17)	41	59	(7)	-	-
40 to 59	(41)	27	73	(13)	-	-
Less than 40	(37)	14	86	(26)	27	73
Attitude toward scientific farming, 1955:						
Very favorable	(41)	12	88	(11)	-	-
Pretty favorable	(32)	9	91	(19)	42	58
Not so favorable	(22)	68	32	(16)	56	44
Years completed in school:						
9 or more	(44)	20	80	(21)	33	67
8	(25)	20	80	(14)	57	43
Less than 8	(26)	35	65	(11)	-	-
Years in farming, 1950:						
40 or more	(16)	38	62	(6)	-	-
20 to 39	(25)	32	68	(15)	87	13
Less than 20	(52)	17	83	(25)	14	76
Social and Economic Characteristics:						
Participation in formal organizations, 1950						
High	(37)	16	84	(12)	-	-
Medium	(38)	29	71	(23)	48	52
Low	(20)	30	70	(11)	-	-

Appendix Table 4. -- (Continued)
(Part II)

Characteristic of Farm Operator	Use of Soil Conservation Service			Use of Vocational Agriculture or Veterans' Teachers		
	No. of Farmers	Dropouts	Regular Users	No. of Farmers	Dropouts	Regular Users
		Percent			Percent	
Social and Economic Characteristics: (Continued)						
Socio-economic status, 1950						
High	(57)	18	82	(25)	40	60
Medium	(27)	41	59	(17)	65	35
Low	(11)	-	-	(4)	-	-
Type of adoption neighborhood						
High	(40)	18	82	(10)	-	-
Medium	(36)	25	75	(20)	55	45
Low	(19)	37	63	(16)	50	50
Value of products, 1950:						
$2,500 or more	(58)	19	81	(18)	50	50
$1,000 to $2,499	(32)	25	75	(23)	52	48
Less than $1,000	(5)	-	-	(5)	-	-

Appendix Table 5.--Percentage distribution of farmers not using agricultural agencies in 1950 by information-user categor and personal and social characteristics, Washington county
(Part I)

Characteristic of Farm Operator	Use of Agricultural Extension Service			Use of Agricultural Stabilization and Conservation Program			Use of Kentucky Agricultural Experiment Station		
	No. of Farmers	New Users	Non-users	No. of Farmers	New Users	Non-users	No. of Farmers	New Users	Non-users
		Percent			Percent			Percent	
Personal Characteristics									
Age, 1950:									
60 or more	(24)	71	29	(48)	42	58	(61)	31	69
40 to 59	(35)	66	34	(89)	56	44	(110)	22	78
Less than 40	(21)	62	38	(57)	63	37	(60)	33	67
Attitude toward scientific farming, 1955:									
Very favorable	(11)	-	-	(50)	48	52	(56)	34	66
Pretty favorable	(38)	66	34	(73)	47	53	(93)	27	73
Not so favorable	(31)	68	32	(71)	58	42	(82)	23	77
Years completed in school:									
9 or more	(4)	-	-	(36)	67	33	(35)	51	49
8	(24)	75	25	(58)	60	40	(72)	29	71
Less than 8	(52)	62	38	(100)	47	53	(124)	19	81
Years in farming, 1950:									
40 or more	(17)	76	24	(36)	44	56	(45)	29	71
20 to 39	(29)	69	31	(69)	58	42	(90)	22	78
Less than 20	(32)	56	44	(87)	56	44	(93)	30	70
Social and Economic Characteristics:									
Participation in formal organizations, 1950									
High	(8)	-	-	(38)	45	55	(41)	37	63
Medium	(23)	78	22	(72)	64	36	(90)	30	70
Low	(48)	60	40	(83)	52	48	(99)	21	79

Appendix Table 5. -- (Continued)

Characteristic of Farm Operator	Use of Agricultural Extension Service			Use of Agricultural Stabilization and Conservation Program			Use of Kentucky Agricultural Experiment Station		
	No. of Farmers	New Users	Non-users	No. of Farmers	New Users	Non-users	No. of Farmers	New Users	Non-users
		Percent			Percent			Percent	
Social and Economic Characteristics (Continued)									
Socio-economic status, 1950:									
High	(5)	-	-	(49)	51	49	(56)	45	55
Medium	(25)	72	28	(64)	69	31	(80)	33	67
Low	(50)	62	38	(81)	46	54	(95)	13	87
Type of adoption neighborhood:									
High	(6)	-	-	(37)	38	62	(42)	33	67
Medium	(26)	63	37	(72)	54	46	(86)	47	54
Low	(48)	67	33	(85)	62	38	(103)	9	91
Value of products, 1950:									
$2,500 or more	(11)	-	-	(65)	46	54	(71)	39	61
$1,000 to $2,499	(52)	71	29	(82)	65	35	(108)	27	73
Less than $1,000	(27)	59	41	(46)	48	52	(51)	12	88

Appendix Table 5.--Percentage distribution of farmers not using agricultural agencies in 1950 by information-user category and personal and social characteristics, Washington county
(Part II)

Characteristic of Farm Operator	Use of Soil Conservation Service			Use of Vocational Agriculture or Veterans' Teachers		
	No. of Farmers	New Users	Nonusers	No. of Farmers	New Users	Nonusers
		Percent			Percent	
Personal Characteristics						
Age, 1950:						
60 or more	(48)	46	54	(58)	5	95
40 to 59	(89)	56	44	(116)	8	92
Less than 40	(53)	60	40	(64)	25	75
Attitude toward scientific farming, 1955:						
Very favorable	(39)	54	46	(69)	19	81
Pretty favorable	(82)	57	43	(94)	8	92
Not so favorable	(69)	52	48	(75)	9	91
Years completed in school:						
9 or more	(23)	70	30	(46)	17	83
8	(62)	60	40	(73)	14	86
Less than 8	(105)	49	51	(119)	8	92
Years in farming, 1950:						
40 or more	(32)	56	44	(40)	5	95
20 to 39	(76)	53	47	(85)	7	93
Less than 20	(79)	56	44	(108)	19	81
Social and Economic Characteristics						
Participation in formal organizations, 1950						
High	(30)	63	37	(54)	9	91
Medium	(75)	67	33	(90)	19	81
Low	(84)	42	58	(93)	7	94

Appendix Table 5. -- (Continued)
(Part II)

Characteristic of Farm Operator	Use of Soil Conservation Service			Use of Vocational Agriculture or Veterans' Teachers		
	No. of Farmers	New Users	Nonusers	No. of Farmers	New Users	Nonusers
		Percent			Percent	
Social and Economic Characteristics (Continued)						
Socio-economic status, 1950:						
High	(34)	59	41	(66)	12	88
Medium	(68	62	38	(78)	13	87
Low	(88)	48	52	(94)	11	89
Type of adoption neighborhood:						
High	(27)	59	41	(57)	14	86
Medium	(71)	49	51	(86)	15	85
Low	(92)	58	42	(95)	7	93
Value of products, 1950:						
$2,500 or more	(53)	59	41	(92)	12	88
$1,000 to $2,499	(89)	56	44	(98)	12	88
Less than $1,000	(47)	47	53	(47)	11	89

Appendix Table 6. --Percentage distribution of farm operators by pattern of utilization of agricultural agencies and by improved practice score, Washington county, 1950

Relationship to Agricultural Agencies	All Farmers (Number)		Improved Practice Score *			Association (gamma)
			Under 40	40-59	60 or more	
Agricultural Extension Service						
Regular Users	171	100	23	25	52	
Irregular Users	87	100	50	40	10	.64
Nonusers	27	100	67	33	-	
Agr. Stab. and Conser. Prog.						
Regular Users	88	100	17	31	52	
Irregular Users	128	100	37	33	30	.32
Nonusers	69	100	47	27	26	
Ky. Agr. Expt. Sta.						
Regular Users	43	100	2	12	86	
Irregular Users	72	100	10	40	50	.80
Nonusers	168	100	55	30	15	
Soil Conservation Service						
Regular Users	72	100	8	18	74	
Irregular Users	127	100	35	32	33	.67
Nonusers	86	100	57	40	3	
Voc. Ag. or Vet. Teachers						
Regular Users	23	100	13	13	74	
Irregular Users	51	100	22	31	47	.47
Nonusers	210	100	41	32	27	
Number of Agencies "Regularly" Used						
High	58	100	10	14	76	
Medium	126	100	28	35	37	.67
Low	101	100	58	35	7	

*Of farm practices applying to a farm, the percentage that had been tried

Appendix Table 7.--Percentage distribution of farm operators by improved practice score and personal and social characteristics
Washington county, 1955

Characteristic of Farm Operators	All Farmers (Number)		Improved Practice Score, 1955*			Association (gamma)
			Under 40	40-59	60 or more	
			Percent			
Personal Characteristics						
Age						
50 or more	160	100	41	36	23	-.39
Under 50	125	100	27	23	50	
Attitude toward scientific farming						
Very favorable	80	100	18	26	56	
Pretty favorable	114	100	34	33	33	.44
Not so favorable	91	100	52	31	17	
Years completed in school						
8 or more	154	100	20	29	51	.62
Less than 8	131	100	53	32	15	
Years in farming						
30 or more	127	100	44	35	21	-.39
Under 30	153	100	28	26	46	
Social and Economic Characteristics						
Participation in formal organizations						
High	149	100	22	27	51	.56
Low	134	100	49	35	16	
Socio-economic status score						
High	164	100	13	34	53	.80
Low	121	100	65	26	9	
Type of adoption neighborhood						
High	67	100	9	27	64	.64
Medium	108	100	18	42	40	
Low	110	100	67	22	11	
Value of products						
$2,500 or more	129	100	12	27	61	.78
Under $2,500	152	100	56	32	12	

*Of practices applying to a farm, the percentage that had been tried.