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# THE DIFFUSION PROCESS

## FOREWORD

*As agriculture becomes more complex and problems of adjustment more acute, it becomes increasingly important to know more about the educational processes which lead people to accept new ideas and adapt them to their individual enterprises. Such information is of particular value to the educational programs of the Cooperative Extension Service in Agriculture and Home Economics. It is of equal importance to other groups in industry and government which work and deal with farm people.*

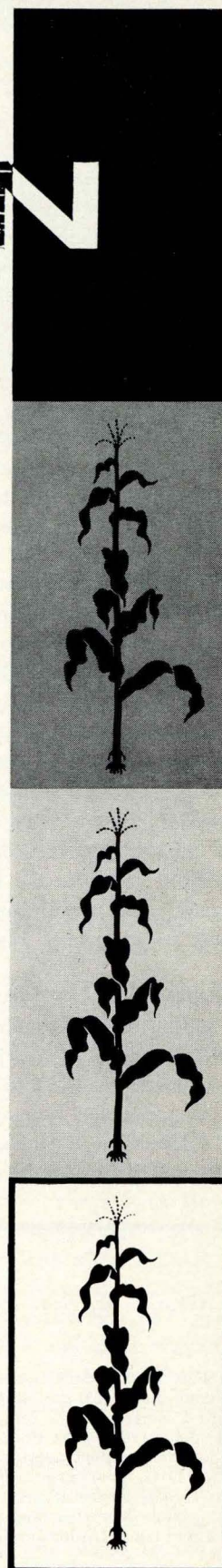
*This publication is a supplement to Regional Extension Publication No. 1, "How Farm People Accept New Ideas." It includes some additional information based on recent research. Basically, it is a summary of a flannelgraph presentation by Dr. Joe M. Bohlen and Dr. George M. Beal of the Department of Economics and Sociology at Iowa State College. This presentation has been given before Extension and college groups and many industrial groups in all parts of the United States.*

*The basic framework of the regional report is the result of group efforts of a Subcommittee for the Study of the Diffusion of Farm Practices, an adjunct of the North Central Rural Sociology Committee, sponsored by the Farm Foundation, Chicago, Ill.*

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## THE DIFFUSION PROCESS

This paper is a summary of the flannelboard presentation on how farm people accept new ideas. It is based on the findings of 35 research studies conducted during the past 20 years in various parts of the United States, including Illinois, Iowa, Missouri, Wisconsin, New Hampshire, New York, West Virginia, Kentucky and Tennessee.<sup>1</sup> The findings of these studies are presented in a framework which will be useful to people who are faced with the problem of diffusing new ideas and practices.

Because the report is a compilation, it must, of necessity, deal with generalizations.

In all of these studies the data were gathered by field interviews with farmers and farmers' wives, and the information represents their points of view. No attempt has been made to determine the ultimate sources of the information used by farm people. Practices studied were farm and home practices, such as use of fertilizer, 2,4-D, antibiotics, contouring, new fabrics and deep freezers as well as several others.

### STAGES OF THE DIFFUSION PROCESS

Data are presented in the framework of two over-all generalizations. The first of these generalizations is that the process by which people accept new ideas is not a unit act, but rather a series of complex unit acts—a mental process. The research seems to indicate that this mental process consists of at least five stages. Evidence supports the belief that individuals can distinguish one stage from another and can designate points in time when they went through each stage.

#### THE AWARENESS STAGE

At this stage an individual becomes aware of some new idea, such as hybrid seed corn. He knows about the existence of the idea, but he lacks details concerning it. For instance, he may know only the name and may not know what the idea or product is, what it will do or how it will work.

#### THE INTEREST STAGE

At the interest stage an individual wants more information about the idea or product. He wants to know what it is, how it works and what its potentialities are. He may say to himself that this might help him increase his income, or help him control insects or diseases, or improve farming or home life in some other way.

#### THE EVALUATION STAGE

The third stage in this mental process is the evaluation stage. The individual makes a mental trial of the idea. He applies the information obtained in the previous stages to his own situation. He asks himself, "Can I do it; and if I do it, will it be better than what I am doing now—will it increase my income, or will it help maximize any other values which I hold important?"

#### THE TRIAL STAGE

If he decides that the idea has possibilities for him, he will try it. The trial stage is characterized by small-scale experimental use, and by the need for specific information which deals with: "How do I do it; how much do I use; when do I do it; how can I make it work best for me?" For example, when farmers were trying out hybrid seed corn, the average planting for the overwhelming majority of farms was 6 acres.

Apparently individuals need to test a new idea even though they have thought about it for a long time and have gathered information concerning it.

#### THE ADOPTION STAGE

The final stage in this mental process is the adoption stage. This stage is characterized by large-scale, continued use of the idea, and most of all, by satisfaction with the idea. This does not mean that a person who has accepted an idea must use it constantly. It simply means that he has accepted the idea as good and that he intends to include it in his on-going program.

These, then, are the stages in the mental process of accepting new ideas and practices. Individuals may go through these stages at different rates, and any given individual may go through these stages at different rates depending upon the practice itself. The complexity of the practice seems to be a major factor in determining the rate and manner with which people go through these mental stages. The following is a categorization of ideas based upon their complexity.

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*By George M. Beal and Joe M. Bohlen*

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<sup>1</sup> The basic information for this report was assembled by the Subcommittee for the Study of Diffusion of New Ideas and Farm Practices of the North Central Rural Sociology Committee, sponsored by the Farm Foundation. Most of the findings used in this report are taken from the works of A. Lee Coleman, H. G. Lionberger, E. A. Wilkening, Robert M. Dimit, Neal Gross, Bryce Ryan, George M. Beal and Joe M. Bohlen. This article has also been published by the Farm Foundation in "Increasing Understanding of Public Problems and Policies 1956."



## DIFFERENCES IN COMPLEXITY OF PRACTICES

The simplest of these categories is a *change in materials and equipment*, such as increasing the use of fertilizer from 100 pounds per acre to 200 pounds.

The second in complexity is an *improved practice*, which involves a change in technique. An example would be switching from broadcasting fertilizer to side-dressing.

The third category of complexity is an *innovation*. An innovation is a change which involves not only a change in materials but also a complex of changes with regard to their use. An example is the use of hybrid seed corn. On first thought, the use of hybrid seed corn might appear to involve only a simple change in materials or equipment; in this instance materials. But the adoption of hybrid seed corn involves a much more complex change. It involves a different framework for obtaining the seed. In many rural communities farmers had attained status and satisfaction from being good judges of seed corn. When they adopted hybrid seed, they had to give up this status and the prestige attached to it. Once hybrid seed corn was accepted, other seeds which fitted this pattern were adopted much more rapidly. Approximately 5 years passed from the time the average individual first heard about hybrid seed until he tried it, and 13 years passed before the majority of farmers adopted it. Now, when a new hybrid variety is developed, farmers go to get seed before the experiment station even has time to propagate it.

The fourth category of complexity of practices is a *change in enterprise*. This involves many innovations. An example is a change from a dairy herd to a beef cattle herd.

Another factor associated with complexity of practices and ideas is the cost. Those practices which cost little seem to be adopted more rapidly than those which are more expensive. From another point of view, those practices which yield the greatest marginal returns per dollar invested, and in the shortest time, seem to be adopted most rapidly. For example, when a farmer was questioned regarding the trial stage in the use of 2,4-D for field weed control, he answered that he had bought a 69-cent can and tried it on his wife's flower garden. This example points out something else. This individual combined the evaluation and trial stage in his own mind. If this same individual were changing over from a stanchion-type dairy barn to a milking parlor and loafing shed type of dairy arrangement, he probably would spend a great deal of time at the evaluation stage. Even though he might take a questioning attitude after installing this new equipment, he would realize that in reality he has no trial stage because once he installs the milking parlor, he cannot afford to change again.

## THE SOURCES OF INFORMATION

The research indicates that the five stages dealt with earlier in this paper are not merely theoretical, but actually are real in the minds of farm people. Evidence shows that people use different sources of information at the various stages in this mental process. Table 1 shows the sources from which the largest number of people said they obtained information at the different stages in the diffusion process. In compiling these data all practices in all studies were combined. The classifications are based on aggregate data. For any single practice the rank of the sources of information may not be the same as designated in table 1.

At the *awareness stage* more people mentioned first hearing about a new idea through mass media than through any other source. Operationally, mass media were defined as those sources of information which were available to the public, such as radio, TV, newspapers, farm magazines, and other forms of commercial publications. This category does not include publications issued by government agencies, which individuals obtained by request. Neither does it include information published by commercial concerns in their house organs, which farm people recognize as coming from that source.

The second most important source of information in terms of making people aware of new ideas was government agencies. This category includes the Extension Service, which was by far the most important, the Soil Conservation Service, Vocational Agriculture and Vocational Homemaking, ACP and PMA, and other government agencies. Next in importance were neighbors and friends, and least important were salesmen and dealers.

At the *interest stage* the greatest number of individuals said they obtained their information from mass media, and government agencies were a close second. Neighbors and friends ranked third, and salesmen and dealers fourth.

At the *evaluation stage*, neighbors and friends were mentioned most frequently. When farmers were attempting to make their decision, they relied more on neighbors and friends than any other source. Government agencies ranked second, mass media third, and salesmen and dealers fourth.

At the *trial stage* the data are not as definitive as at the other stages. However, the rank order as indicated by the studies is neighbors and friends first, government agencies second, mass media third, and salesmen and dealers, again last. At this stage farmers seem to rely upon mass media for information regarding when to apply the practice and upon salesmen and dealers for technical help regarding handling of the equipment.



**TABLE 1. THE ADOPTION PROCESS AND SOURCES OF INFORMATION**

| <u>Awareness</u>                                | <u>Interest</u>  | <u>Evaluation</u>   | <u>Trial</u>                                 | <u>Adoption</u>                          |
|---|--|---|--|--|
| Knows about it; lacks details                   | Develops interest; gathers general information and facts | Mental trial; application to personal situation: Can I do it? | Small-scale, experimental use: How to do it! | Large-scale, continued use; satisfaction |
| 1. Mass media: Radio, TV, newspapers, magazines | 1. Mass media  | 1. Neighbors, friends   | 1. Neighbors, friends                        | 1. Neighbors, friends                    |
| 2. Govt. agencies: Extension, voc. ag, etc.     | 2. Govt. agencies  | 2. Govt. agencies   | 2. Govt. agencies                            | 2. Govt. agencies                        |
| 3. Neighbors, friends                           | 3. Neighbors, friends                                    | 3. Mass media   | 3. Mass media                                | 3. Mass media                            |
| 4. Salesmen, dealers                            | 4. Salesmen, dealers                                     | 4. Salesmen, dealers  | 4. Salesmen, dealers                         | 4. Salesmen, dealers                     |

At the final, or *adoption stage*, neighbors and friends, government agencies, mass media and salesmen were ranked in that order. In over 90 percent of the cases studied, individual satisfaction with the idea was the most important factor in continued use.

In all stages the complexity of the idea is related to the choice of sources. The more complex the idea, the greater is the tendency to rely on government agencies.

When people are making a decision to adopt an idea, they apparently rely on sources which they consider to be objective. Neighbors and friends and government agencies evidently rank high as valid sources of information. Farmers seem to suspect mass media and salesmen and dealers of pushing an idea mainly for the purpose of selling a product.

### DIFFERENCES AMONG INDIVIDUALS

The second major idea of this paper deals with the fact, obvious to most readers, that people do not adopt new ideas at the same time. Some people adopt ideas when they are first introduced; others wait a long time; while some never adopt an idea.

Figure 1 summarizes the data related to this second major idea. The horizontal axis of this figure indicates the time at which a new practice was adopted. The vertical axis indicates the percentage of people who have adopted an idea. Running across the figure is the adoption or diffusion curve. This is a cumulative curve so that at any point on the curve its height represents the total percentage of people who have adopted an idea up to that time.

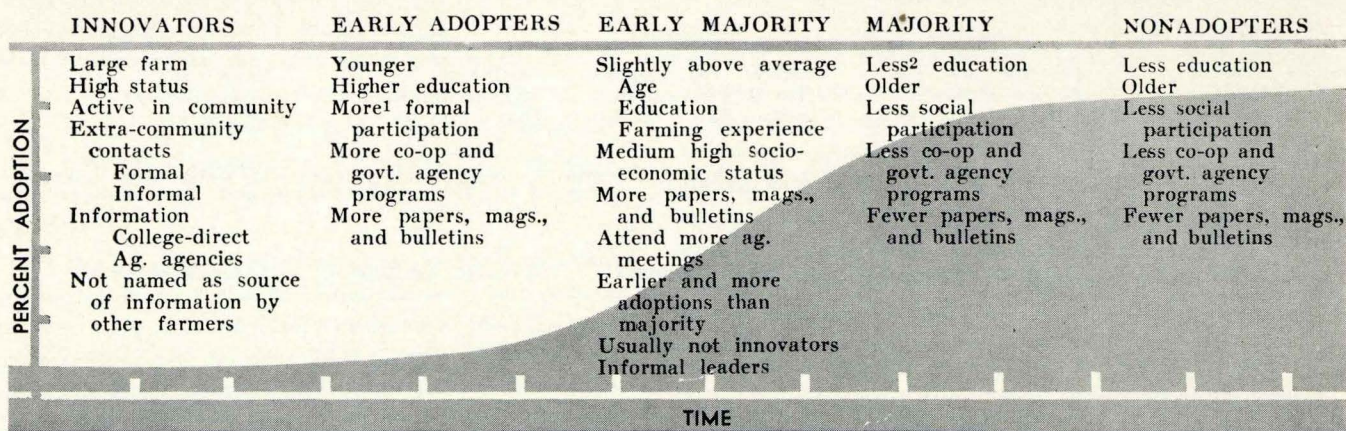
There are no absolute values on either the time or percent adopting axis. The time span over which people adopt a new idea will vary from practice to practice. For instance, after hybrid seed corn had been on the market 15 years, approximately 98 percent of the farmers had adopted it. Perhaps the vast majority of people would adopt another practice in 5 years. Also, quite possibly a given practice might apply to only 30 percent of the people. In the case of hybrid seed corn nearly 100 percent adoption might be expected.

Examination of the diffusion curve shows that it is an S curve, which is close to a normal growth curve. There is a slow gradual rate of adoption, then quite a rapid rate of adoption, followed by a leveling off of the adoption rate. If this were a simple distribution curve instead of a cumulative curve, it would approach a normal bell-shaped distribution. For most practices the adoption curve either fits the normal growth curve pattern or approximates it

The research shows significant differences in selected personal and social characteristics when people are categorized according to time of adoption. Five categories will be discussed: innovators, early adopters, early majority, majority and nonadopters. Although there may be additional categories, the categories presented will serve as tools for the extension worker in analyzing the people with whom he works in terms of their probable rate of adoption. While these data apply to farm practices, other research indicates that similar categories are found in the diffusion of other kinds of practices, for instance, the adoption by medical doctors of the so-called "wonder drugs."



FIG. 1. SUMMARY, ADOPTION CURVE AND TIME CATEGORIES



<sup>1</sup>More refers to significantly more than categories that follow.

<sup>2</sup>Less, older, fewer refer to significantly different from previous categories.

## INNOVATORS

The first people to adopt a new idea are innovators. They adopt ahead of other people. A community would probably have only two or three innovators.

What are some of the characteristics of innovators? They have the larger farms, they usually have a relatively high net worth and—probably more important—a large amount of risk capital. They can afford to take some calculated risks. They are respected and have prestige. They adhere to and represent important community standards. Quite often these innovators come from well-established families. (Perhaps they married the right girl or had the right parents.)

They are active in the community. They have power. They may not hold many offices in the community, but they may act behind the scenes. For instance, they may not be members of the school board, but they have a lot to say about who serves on the board.

Their sphere of influence and activity oftentimes goes beyond the community boundaries. They frequently belong to formal organizations at the county, regional, state or national level. In addition, they have many informal contacts outside their community.

Since they have more formal and informal associations outside the community than most other community members, they have more potential sources of information. This is a partial answer to the question of where the innovators obtain their information and thus ties table 1 and fig. 1 together.

Innovators also get their ideas directly from the

colleges. They go directly to the research worker or the specialist. Even though the innovators get much of their information direct from the colleges and commercial research workers, they also obtain information from such people as county agents and vocational agriculture teachers. The innovators know these people, talk to them and receive their publications. These people usually play an important role in aiding the innovator as he adopts new ideas.

The innovators also subscribe to many farm magazines and papers, including the more specialized publications.

Other farmers may watch the innovators and know what they are doing, but the innovators are not often named by other farmers as "neighbors and friends" to whom they go for information.

## EARLY ADOPTERS

The second category of adopters are the early adopters. They are younger than those who have a slower adoption rate, but are not necessarily younger than the innovators. They have a higher education than those who adopt more slowly. They participate more in the formal activities of the community through such organizations as the churches, the PTA and farm organizations. They also participate more in agricultural cooperatives and in government agency programs in the community. In fact, there is some evidence that this group furnishes a disproportionate amount of the formal leadership (elected officers) in the community. They take more farm papers and magazines and they receive more bulletins than people who adopt later.



## EARLY MAJORITY

The third category of adopters is called the early majority. Figure 1 shows that the number of adoptions increases rapidly after this group begins to adopt. The early majority are slightly above average in age, education and farming experience. They take a few more farm papers, magazines and bulletins. They have medium high social and economic status. They are less active in formal groups than those who adopt earlier, but more active than those who adopt later. In many cases they are not formal leaders in the associations in the community, but they are active in those associations. They also attend extension meetings and farm demonstrations.

The people in this category are most likely to be informal leaders. They are "of high morality and sound judgment." They are "just like their following, only more so." They are only slightly different from their followers. Their position of leadership is informal; they are not elected to it. They have a following only insofar as people respect their opinions. They must be sure an idea will work before they adopt it. If the informal leader fails two or three times, his following looks elsewhere for information. Because the informal leader has more limited resources than the early adopters and innovators, he cannot afford to make poor decisions.

These people tend to associate mainly in their own community. They value highly the opinions their neighbors and friends hold about them, for this is their main source of status and prestige.

They are named disproportionately as "neighbors and friends" in table 1.

## MAJORITY

The next category is the majority. Those in this group have less education and are older than the early majority. While they participate less in formal groups, they probably form the major part of formal organizational membership. They belong to significantly fewer organizations, are less active in organizational work, and take fewer leadership roles than the earlier adopters. They take and read fewer papers, magazines and bulletins from the colleges than do the early majority. They do not participate in as many activities outside the community as do people who adopt earlier.

## NONADOPTERS

The final category includes the nonadopters. They have the least education and are the oldest. They participate the least in formal organizations, cooperatives and government agency programs. They take the fewest farm papers and magazines and receive and read the fewest bulletins.

## CONCLUSION

In concluding this brief summary of the diffusion process, it should be emphasized that this is only a progress report. Most of the research to date has been broad and general rather than specific and penetrating. However this broad, general research has provided information for a number of generalizations, some of which were presented in this paper. The great need for more specific research in various areas discussed in this paper is evident. It is encouraging to note that much research is being done by sociologists and by other groups interested in the diffusion process, not only in the area of farm practices but also in other areas.

**NOTE TO THE READER:** Little attempt has been made in this summary of the flannelgraph presentation to tie the basic concepts in table 1 and fig. 1 closely together. Nor has very much been presented in the way of generalizations that might apply to specific groups, such as the one to which you may belong. As the flannelgraph presentation is given before specific groups, such as extension workers, manufacturers, salesmen, editors, advertisers, etc., generalizations and applications of particular interest to each group are presented after the basic presentation.

Two additional publications that supplement the information in this outline may be obtained from the Publications Distribution Room, Morrill Hall, Iowa State College, Ames. One is "How Farm People Accept New Ideas," North Central Regional Publication No. 1. The second is a bibliography called "Social Factors in the Adoption of Farm Practices," prepared by the North Central Rural Sociology Committee. This bibliography lists most of the studies completed in the area of diffusion and may help you in obtaining material that deals with your specific area of interest. Single copies of these pamphlets are free. Additional copies are 10 cents each with a 10 percent discount on lots of 100 or more.



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