Speeding Adoption of New Technology in Rural America

Paul Gwin
Extension and Agricultural Information

H.F. Lionberger
Department of Rural Sociology

What sociologists have learned

First, they have identified groups of people who are inclined to adopt new ideas at different rates. Sociologists maintain a classification somewhat like that in Chart 1.

Chart 1. Community Adoption Stages

Those earliest to adopt make heavy use of research and expert sources of information. Late adopters rely heavily on other farmers as sources. The majority use mass media channels heavily for information but turn to peers (mostly fellow farmers) for evaluation and advice.

The time span from discovering an innovation until it is adopted by most farmers varies greatly. A totally new concept may take many years. Adoption of hybrid corn, for example, took about 14 years. Hybrid milo, on the other hand, was adopted almost immediately because farmers were familiar with hybrid corn production.

Second, the sociologists found that most people go through different stages in adopting a new practice. For example, for new farm practices coming from agricultural research in colleges and industry. The steps are often like those in Chart 2A.

Chart 2A. Individual’s Adoption Stages

When local planners or others start with a problem and begin searching for alternatives, the pattern is different from the research center-to-farmer flow depicted in Chart 2A. It looks more like Chart 2B.
The selected alternatives usually are products of research. Frequently, they are ones suggested by the extension workers. Thus, irrespective of whether the process starts with awareness or a problem, the pathways to knowledge are similar (Charts 2A and 2B).

Third, the sociologists found that at each stage in the adoption process people have different information needs that extension workers (sometimes called change agents) can help to meet. The summary chart below shows:

- The function an individual needs to perform at each stage in his adoption process before he can move to the next
- The kind of information required to fulfill the function
- The sources farmers usually use to find this information.

Fourth, the researchers have learned that adoptions start slowly, pick up momentum and then decrease in rate after half or more of the potential adopters have adopted.

Table 1
Information needs of farmers at different stages of adoption

<table>
<thead>
<tr>
<th>1. Functions</th>
<th>2. Kind of information needed</th>
<th>3. Preferred sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>Become informed</td>
<td>Notification</td>
</tr>
<tr>
<td>Trial</td>
<td>Decision to use</td>
<td>Application</td>
</tr>
<tr>
<td>Adoption</td>
<td>Confirmation</td>
<td>Own results, Experience of others</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adoption starts slowly because most people want to see successful local trial results before they adopt. That takes time. The rate of adoption increases as people begin to talk to and persuade each other. It picks up until the adopters outnumber the non-adopters. That's what puts the hump in the adoption curve. If people did not talk to and influence each other, the curve would look like a straight line.
Example of technology transfer from researcher to farmer

To better understand the adoption process, let's trace the steps a new discovery might take in reaching farmers and becoming adopted. Assume the MU Agricultural Experiment Station has developed a solar heating unit for confinement farrowing houses. The researchers have tested the heating unit and found that installation costs can be recovered in two or three years — at a saving of XXX cents per pig — under Experiment Station conditions.

A committee appointed by a County Extension Council to find ways to reduce the use of petroleum products (and costs) on farms hears about this new solar technology through their livestock specialist. The committee decides to set a goal of getting one third of the county's 75 confinement hog raisers to convert to the solar units in the next three years if they can prove practical on local farms. As far as the committee knows, no local farmer has tried one of the solar units.

The most likely adoption pattern

It can occur without MU Extension's help, but presumably at a slower rate.

- Innovators either invent or, more likely, learn about inventions and try them first. They usually learn about innovations, construction and operational details from researchers at the university, from other progressive farmers or even from specialized trade magazines. However, in this instance, members of the committee might be able to talk one or more of the county's innovators into trying the solar unit.
- Most other farmers read about such innovations as the solar hog houses in the paper. Or they hear about them over the radio or from their neighbors. Eventually, interested farmers will seek additional information, perhaps from a neighbor or from an extension specialist. Certainly, they will observe what the local innovators are doing.
- Farmers will talk about what is going on — asking questions and getting answers from others who have solar hog houses or are thinking about building some. In other words, the subject of solar hog houses gets squarely on the local farm talk agenda.
- When the more influential farmers — those trusted for their good judgment — adopt solar heating, the vast majority will follow in rapid succession — if the experience of innovators and influentials has not turned up important negative consequences. (For example, some have turned from active solar heating to the less expensive passive types.)
- Late adopters ordinarily will adopt (if at all) mostly because of social pressures, not rational consideration of the pros and cons of the innovation. By that time the early adopters will have reaped most of the profits from being...
out ahead.

The change agent's problem

The problem for you as a change agent is to facilitate those normal decisional-diffusion processes, not to circumvent or short-circuit them in hope of speeding up adoptions. Multiplying effects will come mostly from people talking to people and influencing each other — not directly from your newspaper item, radio talk or personal conversation with farmers, or in fact anything else you do. But you can help facilitate the people-to-people flow by well planned use of meetings, demonstrations, tours and the news media.

Ways to aid the flow

Assist innovators

A few innovators possibly will have learned about solar hog houses before you and already may have decided to try one. Your educational problem for them becomes one of helping them be successful. That is the normal thing to do anyway, but it is especially important with them because they will serve as demonstrators for others. Another educational opportunity for you is to learn the problems the innovators encounter and how they overcome them. Other farmers would like to know so they can adapt the innovations to their situations.

When one or more innovators has achieved success, enlist them in your educational effort, if possible, particularly the more influential ones. This may include their involvement in tours, demonstrations, meetings and media releases or interviews featuring results. Here, as always, getting the innovation on the farm talk agenda is a prime objective.

Make others aware

While still working with innovators, start using radio, newspapers, television and any other means available to create awareness of the innovation among other farmers. In the case of the solar hog house, you can communicate details about the Experiment Station's results at first. Remember, getting additional information, thinking matters through and deciding normally takes farmers time. For example, it took five years in most cases between a farmer's first knowledge and first use of the idea of adopting hybrid corn in Iowa.

Supply details to expand discussion and interest

In the interest stage, farmers need to get more detailed information about what the innovation is, its likely consequences, what it will and will not do, how it will fit into their own plans, its cost, whether it is more useful than what they are already doing, its economic and social consequences — or in general those things that farmers want to know before accepting the innovation. When possible, they usually prefer to try a little first and more later, when that approach works.

Radio broadcasts, personal conversation and newspaper articles can be used to provide additional information. Potential adopters should be pointed in the direction of their local MU Extension center and Extension publications (which can be read and reread, as needed). Tell the farmers where they can get this additional information.

The farm talk processes should be facilitated. The mass media may be used to keep solar hog houses on the talk agenda. Talks can be given and farmers can be encouraged to discuss the solar heating systems at meetings. Radio broadcasts and newspaper articles can communicate "what farmers are saying about solar hog houses": maybe some successful users can be enlisted as guests on radio programs.

Facilitate talk with successful users at evaluation stage

At the evaluation stage, farmers have to decide whether solar heating of hog houses is a good thing. They have to evaluate the information they have collected in light of their own personal situation. Most of all, they will be looking for local trial information and the advice of other farmers they trust. It will be helpful at this stage to do whatever can be done to get information about local trial and local results circulated and talked about. Tours to farms, where these units are in use, and meetings, where successful users are present to talk to other farmers, will help. It's important that potential adopters have plenty of opportunity to ask questions in non-threatening situations.
Change agents should always take special note of what successful farmers are saying and be prepared to communicate this to other farmers. Most farmers are much more influenced by how the innovation worked on a local farm than by results under experimental conditions at the university research farm.

**Application stage**
The information problem here is distinctly different. Farmers who have already decided to use a solar hog house needs simple, concrete information on how to build and operate one. They may also need to know where they can get needed building materials. Properly prepared publications would be excellent for them at this stage. They also need to know who is willing to give them first-hand information about how to solve problems. This could be other farmers, an extension engineer or a supplier or builder.

Properly informed dealers from whom farmers may purchase their materials can be helpful. Special efforts to inform suppliers can pay big dividends.

**Some reinforcement information useful at adoption stage**
Adoption, defined as a decision for sustained use, depends most on actual results achieved, usually as a result of one's own limited trial. The farmer's own experience is most important, but the successes of others are a helpful reinforcement. Educational efforts at this stage should present objective evidence of results both in dollars and cents and in terms of other outcomes that are important as farmers see them. Farmers, of course, should discontinue the use of solar hog houses just like anything else, when something better comes along. But they should discontinue for the "right" reason. Reinforcement information concerning results will help prevent discontinuing for the wrong reason. For example, a government subsidy is used to encourage terracing. But farmers need to be motivated to continue terracing to conserve their soil even when the subsidy stops.

**Some implications of communications research:**

1. We should get people involved in the educational effort (meetings, committees, program planning, action and the like). This facilitates interpersonal communication and the exercise of influence of one person on another. It also is the source of much free and willing help.
2. It may be advisable to identify innovators (persons usually first to try new practices) for special educational help, mostly to help them be successful innovators. They test the new ideas and technology and make adaptations for local use. They assume risks others are not willing to take. You need to know their problems and their solutions. Farmers are interested in knowing about this.
3. Influentials are persons to whom others look for advice in arriving at their own adoption decisions. They also are likely to be early adopters. They are good choices for demonstration farmers. But if they are used too often or if they are the recipients of too much favorable attention, they may lose their influence. Also, their influence may not extend to low income and other economically disadvantaged segments of the population. Special programs may be necessary for them. Remember, extra attention to progressive farmers — to the relative exclusion of the smaller and generally less progressive ones — will likely increase the gap between the " littles" and the " bigs."
4. The mass media channels (newspapers, magazines, radio, television) are useful in the awareness and interest stages, but they are of limited use for persuading people. However, they can help facilitate the person-to-person communication of farmers that is necessary in evaluation and trial stages. The important thing is to give people the information they need at each stage in the innovation-adoption process and to use the channels best able to do it, as illustrated in the examples and Chart 3.
5. Don't expect too much too soon. Remember that it often takes a long time to get from first knowledge to first use; also that most farmers prefer to wait until a new idea or practice has been tried locally before trying it themselves. This, of course, takes time. Adoptions normally start slowly and pick up momentum. When influentials have adopted and started talking favorably about the innovation and it is on the farmers' talk agenda, the take-off point has been reached. You probably couldn't stop adoption at this point if you tried.
6. Each county or community has its own channels for information acquisition and exchange. The change agent needs to find out what they are and to use them judiciously. Even though only general suggestions on how to proceed are possible, the following should be helpful:
   - Plan your communications strategy to serve users, not the extension service. You will accomplish this best if you think in terms of serving the clients. Listen much and carefully to know what farmers are thinking.
In preparation for educational programs, gather how-to-do-it information for the major enterprises your clients (committees, individuals enrolled in Family Farm or Small Farm program or others) choose or are likely to choose. MU publications will be main sources. Subject matter specialists and other personal sources and agencies can be very helpful at this planning stage. With some of these sources, you just need to be informed of who they are, get acquainted with them and know how people can contact them.

Go through your plan of work and plan ahead for the types of coverage you will need for the different projects. Include plans for gathering the communications materials you'll need to carry out your plan of work.

Use as many channels as you can for awareness, interest and timely information. A single channel is seldom as good as two or more. Use repetition whenever it is possible and seems important. Don't overlook such simple channels as announcements and talks at business, club, organization, and church meetings — and calling committees.

Seek the aid of professional journalists in your territory. They like to serve their community, too, and generally are better writers or broadcast performers than extension workers. Supply them with the tips and information and let them write or tell about your program. They will want to know the information needed to supply the five Ws and the H (Who did What, When, Where, Why, and How?). Include all the local names you can.

Some points to cover in mass media

- Do advance stories to announce upcoming meetings, events and committee appointments. Follow up with stories on the events after they occur, and stories on the progress and results of committee work. Where the aim is to spread adoption of new technology like our solar hog house example, advance stories on the research results or a local innovator's results, if available, will help create awareness and interest.
- Seek coverage of educational events whenever committees and others meet as a group or carry out action. Again supply the five Ws and H. Keep committees involved and active in the program. An annual recognition dinner or similar event should be held where progress is reported. This serves as a news peg to inform the community as well as those who attend. See that these events get covered by the press.
- Feature or success stories: If an innovation such as the solar unit is successful locally, you will have first the innovators, then early adopters that make good success stories. You also will have some people with ideas for improvements. Give the reporters (don't forget radio and television) tips on these people, including what to look for that is outstanding about them. Keep in mind the objective of this media exposure is to get people talking about the innovation and that ultimately people talking to people will be the direct influence on adoption. Stimulating the discussion is our goal.
- Make up an information calendar listing dates when timely information of use to people in special programs, and farmers in general, should be released to the press and through newsletters.

Related MU Extension publications

- CM1306, How to Have a Successful Educational Meeting on a Public Issue
  http://extension.missouri.edu/p/CM1306

Order publications online at http://extension.missouri.edu/explore/shop/ or call toll-free 800-292-0969.