

VIEWPOINT

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Changing Roles within Horticultural Extension

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Change is such an ingrained precept of extension doctrine that it rarely elicits a rebuttal. Yet, the change we generally agree upon is change by others—our clientele or target audience—not ourselves. This article is about change within a publicly supported institution, the Cooperative Extension Service.

Fundamental change from within institutions organized in a hierarchical structure is generally a slow and ponderous process, as self-serving forces act to provide stability and stifle radical adjustments (3). Nevertheless, a public institution that fails to remain relevant to society might be forced to change by budget cuts or the threat of elimination (8).

The public extension institution developed in the United States at a time when a large part of the population relied directly on farming for their livelihood (4). Although only a small portion of the U.S. population still lives on farms, federal, state, and local governments continue to support agricultural research and extension. Proponents of the system argue that development of agricultural industries is in the best interests of all of society. This article will review the relevance and appropriate role of public agricultural extension, with respect to 1) the development of technology, 2) dissemination of knowledge and how people learn, and 3) the appropriate role of government. Documented perceptions of the changing role of state horticultural extension specialists will provide an example of how this group is attempting to stay relevant in a dynamic society.

DEVELOPMENT OF TECHNOLOGY

Holt and Schoorl (2) provide a useful model for development and adoption of new technology in which the life cycle of technological change includes the consecutive stages: 1) innovation; 2) diffusion; and 3) servicing. In this model, new technologies or information must first be generated (*innovation*). Next comes the *diffusion* of new knowledge through a target community. The traditional extension methodologies of grower meetings and publications are examples of diffusion. Following diffusion of knowledge, *servicing* is required for the introduced technology to be used continuously and effectively. Technical advice and back-up determine the extent to which a new technology will realize

its potential. Servicing of technology implies a close personal relationship between the professional and the client. The boundaries between innovation, diffusion, and servicing are not rigid, but each phase is required for effective development of new technologies.

Although Oakley (9) argues that the technology innovation transfer model for extension is not effective in developing countries, it remains the dominant model for agricultural extension in the United States. It may be useful to consider the Holt-Schoorl model (2) as public research/extension organizations evaluate their roles in stimulating agricultural development through adoption of new technologies. For example, development of new knowledge is accomplished through basic or fundamental research (innovation). Interpretation and adaptation of new knowledge to usable information or technology is accomplished through applied research. Since this usually entails the testing and retesting of technologies, it may be conducted by extension staff in cooperation with potential users. In this way, applied research may be considered a bridge between the innovation and diffusion phases of technology development.

Close alignment of extension staff with research staff is required to facilitate the innovation-diffusion continuum. Extension workers who emphasize delivery of information without strong ties to innovation may find themselves to be teachers of old information. Ruttan (13) presents an argument for institutional changes that strengthen the linkages between advances in knowledge (basic research) and advances in technology (applied research). J.B. Kendrick provides the following advice for extension: ". . . its personnel must become increasingly engaged in applied and site-specific research activities" (5). On the other hand, extension programs that ignore the important role of servicing (adapting new knowledge to existing farm situations) will fail to encourage the full exploitation of the new technologies. Integration of new knowledge into the whole-farm system is often overlooked in public extension today, and specific application of new information is left to a process of trial and error by the individual farmer.

It is in vogue today to criticize one-to-one extension methodology. However, personal dialogue is the only way to service specific opportunities and deal with problems relevant to individual users of technology. Holt and Schoorl (2) claim that one-to-one communication is the most effective form of ser-

vice. To be successful, however, a rapport needs to be built between client and professional that only can be achieved over an extended period of time. Working with individuals is surely an important part of technology adoption and employment. The critical question is not: "is one-to-one extension needed?", since it is the key to servicing technology. Rather, it should be asked, "is one-to-one servicing of clientele an appropriate role of public institutions?" The answer is, I believe, sometimes, depending on our understanding of how people learn and the appropriate role of government.

DISSEMINATION OF KNOWLEDGE AND HOW PEOPLE LEARN

Extension methodologies should be evaluated based on recent research findings in adult education. The traditional concept of the extension advisor as a teacher or "change agent" must be modified in light of our understanding of learner-driven education. Tough's (14) conclusion, that 73% of adult learning is planned and carried out by the learner, casts serious doubts on the ability of extension to actively cause change. The idea that adoption of information takes place following a one-way flow from the "all-knowing expert" to the farmer is acknowledged as paternalistic and not particularly useful (9). In fact, farmer motivation is the most important influence on adoption of new knowledge.

Although we no longer believe that knowledge alone creates change, it is unlikely that continued change (progress) will occur without new knowledge. The public research/extension institution involved with development of new information has an obligation to communicate that information. This communication may take various forms, including public access to research findings through scientific literature, publication of textbooks and other compendia, computer data bases, and classroom teaching (both on- and off-campus).

An appropriate role specific to agricultural extension might be to allow self-motivated farmers access to information developed through basic and applied research. It should be noted that there is an operational difference between allowing access to information and advocating adoption of a new technology. Recognition of this difference frees the public extension advisor from a perceived responsibility to actively cause change. Further, it recognizes that public extension is only one of the many sources of information

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used by self-motivated farmers to make decisions.

Public extension advisors must continue to be part of the total knowledge arena in which decisions are made. Self-motivated farmers may choose to access information from a public extension advisor if the advisor is 1) a personal acquaintance, 2) knowledgeable, and 3) easily accessible. A study of rural landholders in Australia concluded that the primary source of information for farmers was the "intimate expert" (10). The term intimate expert is particularly useful, as it describes two of the attributes needed for the advisor to be successful in a diffusion/servicing role. "Intimate" implies a personal relationship of mutual trust. This may take many years to develop, and is the traditional role of the Cooperative Extension Service County Agent. The term "expert" implies respect for the knowledge and ability of the advisor. In many specialized and highly technical agricultural industries (such as horticulture), the knowledge base of a generalist advisor may not be relevant to the needs of the client. How often do we hear that the industry is ahead of the public extension service with regards to new technologies?

The most valued source of information from public extension would be a subject matter specialist having a close personal relationship with the client. This would provide the intimate expert sought by self-motivated learners. It would also require a major commitment of government resources to allow the third attribute of a successful advisor, i.e., "easy access". Decreasing federal resources make it highly unlikely that an adequate number of public intimate experts will be generally available. In some states, local and state governments have provided support for a strong county specialist system that does satisfy this need for intimate experts. In many areas, however, the growth of private crop consulting businesses continues to fill this need.

The extent and nature of involvement of federally funded services in agricultural extension should depend on the potential benefits to society. It is not in society's best interests for public extension to provide a free diffusion/servicing organization to a small segment of the population if the same role can be provided by the private sector. The relationship between public extension and private extension (crop consultants and commercial salespersons/advisors) needs to be examined in the light of what is the appropriate role of government (1).

THE APPROPRIATE ROLE OF GOVERNMENT

It is easy to understand how individual public extension workers might lose sight of the overall purpose of government service. Close ties with agricultural clients can lead to misplaced loyalty towards target audiences rather than society in general. Extension workers may come to think of themselves as serving a specific group of people (sometimes resulting in intra-organization competition). If we hope to remain relevant to society's needs, future extension programs

should be planned and evaluated with strict regard to the appropriate role of government service.

The overall goal of public research and extension should be to serve the community as a whole by maximizing the community's economic and social well-being. Public support for agricultural research and extension activities are justified when they serve the public interest (5). Government has a role in providing goods and services that have a net social benefit when they would not be provided by the private sector due to the nature of the goods or services. Three categories of goods that fit this requirement are 1) public goods, 2) private goods subject to market failure, and 3) social welfare goods.

"Public goods" are those that are used in a non-rival manner by society. Goods (such as research results) available to one person are available to all without additional cost. Private enterprise is unlikely to invest in goods used in a non-rival manner because it is difficult to set a price for these goods and realize a return on the investment. "Private goods subject to market failure" are those that may have quantifiable value to individuals, but for which the private sector is likely to underinvest (market failure). Government may choose to provide such goods if they have significant social benefits. An example of this might be a government extension program designed to reduce pesticide contamination of groundwater. "Social welfare goods and services" are provided by government for reasons of equity, rather than efficiency. Education for the young, a minimum amount of food, and shelter are often considered social welfare goods.

THE ROLE OF PUBLIC AND PRIVATE EXTENSION

A government role in basic research is generally accepted, since knowledge is considered a public good (consumed in a non-rival manner). Private enterprise (either corporations or individual farmers) are not likely to invest in basic agricultural research unless they have proprietary rights to the new knowledge. Therefore, a significant public role in basic research should continue.

A government role in applied research is also generally accepted as a public good. Ruttan (14) states that much applied research would not be done unless it was funded for the most part from public sources. However, often a target group (a corporation, industry association, or grower organization) can be identified that will receive direct benefits from the research and will be willing to share the costs.

The appropriate role of government in diffusion of information and servicing individuals is not always clear. A wholesale either/or approach to the role of public extension in diffusion/servicing would not serve the needs of society in a cost-effective manner. In the future, government-sponsored extension services should be flexible enough to provide varying levels and types of assistance, depending on specific objectives and beneficiaries.

There are appropriate and complementary

roles for both government extension advisors and private extension advisors. Successful integration of these requires better definition and understanding of each (11). In situations where there is a clear beneficiary of the service, private extension might be considered the appropriate alternative. In this situation, a highly individualized servicing of special needs can take place. The client is more likely to receive the service requested, rather than the service someone else is willing or able to provide.

In cases where the beneficiary is not likely to adequately invest in new knowledge, yet there is a clear benefit to society, public extension might continue to provide a dissemination/servicing role. It is appropriate for public extension to provide direct service to individuals when it also serves the community as a whole. Agricultural chemical pollution, pest epidemics, and soil conservation issues might be appropriate areas for public involvement in dissemination of information and servicing of individuals. In this way, extension may work for the public by working through individual clients.

Although private extension already exists, it must become a more-important part of the knowledge arena in agricultural development. This can be achieved by restricting public servicing of individuals to cases where the private consultant is not appropriate. Further, private extension should be considered as a goal of the development process from the outset of a new extension project. For example, a public project designed to develop a new industry or introduce a new technology might provide research, assistance with adaptation, and individual servicing. However, the project could also include components that encourage the growth of private extension concurrent with growth or changes within the target audience.

At present, public extension does little to encourage private extension, or, in some cases, even prevents development of consulting services through publicly subsidized competition (11). An appropriate development project for public extension might be to encourage the growth of new agricultural support industries. This might be assisted by 1) registration of consultants, 2) training private extension advisors, 3) referring clients when appropriate, and 4) allowing consultants access to knowledge resources and encouraging their participation in conferences and schools.

During the development phase of private extension, hybrid concepts, such as public "fee for service" mechanisms, might be appropriate (12). Private extension should be encouraged through training programs conducted by public research and extension staff. In addition, public extension workers could develop educational materials, such as publications, diagnostic tools, videos, and computer programs for use by private advisors. This outreach might help foster a positive working relationship between the two advisory groups while it helps to define the role of each.

Of course, in a democratic society, public extension can continue to service individuals

when local government (and local taxpayers) choose to provide adequate support. This is the case in some homogeneous agricultural counties where a large percentage of the community will be served by a public extension effort.

AN EXAMPLE OF CHANGE IN HORTICULTURE

Horticultural industries in the United States are highly specialized and relatively rapid adopters of new technology. Extension workers in close contact with research staff, or involved with development of new information themselves, will be able to remain relevant to a dynamic industry. Those who do not maintain a close association with the research "innovators" may find themselves learning about advances in technology from their clients. These individuals may slip into the "Robin Hood" mode of extension, in which they steal from the knowledge-rich and give to the knowledge-poor. If they do not provide any useful (expert) function for the knowledge-rich, this source of information will also quickly disappear in spite of an "intimate" relationship.

State horticulture extension specialists have made a clear commitment to join the innovators. A survey conducted of 288 state horticultural extension specialists in the United States found that 54% were doing more research in 1983 than 10 years earlier. In addition, most reported that the applied research in their state was done by either extension staff or extension staff in cooperation with research staff (1).

The apparent commitment of research staff to the development of new knowledge through basic research (7) and the movement of extension specialists into adaptation of the knowledge through applied research satisfies the first two stages of the Holt-Schoorl model of technology development. The weakness

appears in the area of diffusion and servicing, formerly the foundation of extension. Of course, since innovation and diffusion overlap to some extent, part of the diffusion process remains intact. As extension specialists adapt (test and retest) new knowledge, cooperating clients (probably self-motivated learners) will benefit. The question remains, however, as to who will continue the diffusion process and provide individualized service.

When horticultural extension specialists were asked if there was an adequate number of qualified county extension agents or advisors in their state to serve the immediate needs of clients, 73% responded that there was not. In a limited number of counties, a specialized county advisor fulfills the need for an intimate expert. However, in most cases, the county agent position is that of a generalist rather than an expert. When asked if private consultants are likely to take on more of the responsibilities previously carried out by the public extension service, 66% responded in the affirmative.

Horticulture specialists have also recognized the need for more industry support of applied research. When asked if they had sought private support for their programs, 71% responded yes. Further, the two most successful sources of funding were grower organizations and agricultural industries. Many horticultural specialists have accepted the important role of interpretation and adaptation of new knowledge through applied research. Further, they have sought and received private funding for projects that benefit both individuals and society (1).

State horticultural extension specialists can continue to demonstrate their ability to change by increasing their efforts to support the development of a stronger private extension service. We should attempt to build strong ties with private extension so that we do not

"lose touch" with what is happening on the farm. As always, we must remain flexible and visionary (6) as we learn to work in the political and social environment of the future.

Literature Cited

1. Gerber, J.M. 1985. Extension specialists: A self analysis. *J. Ext.* 23:8-11.
2. Holt, J.E. and D. Schoorl. 1985. The role of innovation, servicing and obsolescence in agricultural extension. *Agr. Systems* 18:239-250.
3. Holt, J.E. and D. Schoorl. 1986. The system level of change and its impact on the role of agricultural organizations. *Agr. Systems* 22:203-213.
4. Kelsey, L.D. and C.C. Hearne. 1955. Cooperative extension work. Comstock, Ithaca, N.Y.
5. Kendrick, J.B. 1986. Reflections and projections. *Calif. Agr.* 40:2-3.
6. Larsen, R.P. 1988. Comprehensive extension system—the land-grant example. *HortScience* 23:479-482.
7. Lewis, L.N. 1985. The academics and technology transfer. *Calif. Agr.* 39:2.
8. Nipp, T.L. 1988. Congress and the future of agricultural research, extension, and education. *J. Prod. Agr.* 1:187-190.
9. Oakley, P. 1988. Extension and technological transfer: The need for an alternative. *HortScience* 23:482-485.
10. O'Brien, S.J. 1982. Self-directed learning by rural landholders in the Melbourne District. Dept. of Agr. and Rural Affairs. Melbourne, Australia. DARA Research Project Series no. 153.
11. Post, G.R. 1988. The private consultant—benefit or burden? *HortScience* 23:490-492.
12. Read, N., J.J. Quinn, and A. Webster. 1988. Commercialization as a policy mechanism in UK agricultural research, development and extension. *Agr. Systems* 26:77-87.
13. Ruttan, V.W. 1983. Agricultural research policy issues. *HortScience* 18:809-818.
14. Tough, A. 1982. Intentional change: A fresh approach to helping people change. Follet, Chicago.