Extension Education Methods

Challenges to Extension Programming

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SUMMARY. The way extension specialists and educators conduct programs, such as workshops, and transfer information to their designated clientele, including homeowners, professionals, and specialty groups, has changed within the last decade due to merging departments, budget cuts, reduced operating funds, and lack of refilling vacant positions. These factors have resulted in a number of driving forces that influence the way extension specialists and educators perform their duties, such as accountability, regionalization of extension, impact of technology, and expanding expertise. To be accountable under today's standards, extension specialists and educators must document the impact, relevance, and effectiveness of their programs. Required documentation must include economic, environmental, and human development factors. The effect of downsizing in many states has led to regionalization, which involves sharing extension specialists and educators across state boundaries. Although there are concerns, such as funding issues and evaluation of extension specialists and educators among states, regionalization in general has resulted in collaborative efforts to organize workshops

and produce regional publications that serve a wider clientele base. Extension specialists and educators need to use computer-based and electronic technology, such as teleconferencing and distance-education, to present effective programs and address a wider audience, which will reduce the amount of required travel time. Finally, extension specialists and educators need to keep abreast of issues, such as invasive species, and develop programs to increase awareness of the economic and ecological impacts of invasive species in order to effectively serve the clientele base. Extension specialists and educators will more effectively serve their clientele, justify the importance of extension programming, demonstrate extension as a valued resource to administrators, and deal with the challenges of financial constraint existing now and in the foreseeable future by documenting impact, using multi-state programming, adopting new technology, and keeping up with current issues.

The tradition of extension throughout the U.S. has been to link academia and clientele, which may include homeowners, professionals, or specialty groups, and to interpret and disseminate information in an understandable manner (Astroth, 1990; Goodwin, 1990; Lincoln and Blair, 1977). This has been accomplished primarily through the efforts of extension specialists and educators who attempt to address educational needs of clientele and also meet the research demands of commodity groups within a state (Carter, 1990). In general, this model has sufficiently served the needs of state clientele. However, the ability of extension specialists and educators to perform their duties is being affected by a number of factors, such as the

merging of related departments (e.g., entomology and plant pathology), budget cuts, declining operating funds, and inability to fill vacant positions (Brandenburg, 1997; Havenstein, 1990; Parrella et al., 1995). As a result, extension specialists and educators are often advised to "work smarter," "restructure," and do more with fewer resources (Laughlin and Schmidt, 1995). As an extension specialist in ornamental entomology at the University of Illinois (Champaign-Urbana), I have observed changes that have and will continue to have a profound impact on extension as it relates to the mission of land-grant universities. In this article, I describe four driving forces that are likely to, and in some cases already have, influence the way extension specialists and educators conduct business: accountability, regionalization of extension, impact of technology, and expanding expertise.

Accountability

The effectiveness of extension specialists and educators is no longer based on the number of publications and presentations, as university administrators have changed the evaluation process (Kelsey and Mincemoyer, 2001). Extension programs, including workshops and/or conferences, must now demonstrate impact, relevance, and effectiveness (Ludwig, 2002). Impact may have economic, environmental, or human development ramifications (Graf, 1993). In fact, extension programs that fail to attract an audience or are unable to demonstrate impact are likely to be terminated (D.R. Campion, unpublished), which may be especially problematic for extension programs designed for smaller-sized groups such as organic growers, wine producers, and specialty crops.

Extension programs are now based primarily on pre- and post-program impacts. These impacts are determined by surveys or evaluations, which are under the scrutiny of human subject independent review boards (M. Merchant, personal communication). Survey or evaluation questions must be written in such a manner as to demonstrate quantitatively some type of impact on clientele, whether it be learning new technologies or providing relevant information that will affect the decision-making process.

Program impact may be demonstrated by the number of times that a

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publication (i.e., fact sheet) is downloaded from the Internet or particular website. Documented testimonials such as letters of support from clientele, and documented changes in production practices may also serve as indicators of program impact. Greenhouse management workshops are conducted in Illinois during the summer and include presentations from extension specialists and industry personnel. A grower from one of the largest greenhouse operations in Illinois attended a workshop in which there was a discussion on the management of pests using biological control. Subsequently, this grower began using beneficial nematodes to manage fungus gnats (*Bradysia* spp.), a major greenhouse pest of poinsettia (*Euphorbia pulcherrima*). The use of this biological control strategy has resulted in a significant reduction in pesticide use. This documented case study is an example of an extremely useful demonstrable impact.

In addition to program impact, the success (or accountability) of extension specialists and educators is increasingly being based on productivity, which is measured by grant dollars, particularly those with indirect costs, and peer-reviewed journal articles (Ezell, 1989). However, it is important that college and departmental administrators give consideration to the time required to make extension presentations at workshops and conferences. This includes preparation time, travel time, the actual presentation, follow-up questions afterward, and even questions by phone or e-mail long after the presentation, which may serve as indicators of program impact. Preparation and maintenance of documentation is essential, in order to inform administrators and colleagues of the impact of delivering high quality extension programming.

Regionalization of extension

As fewer resources are currently allocated for extension, compared to 10 years ago, there is a need to re-evaluate ways to use existing human resources more efficiently, which has resulted, in some cases, in the regionalization of extension programs (Meier, 1989). The impact of downsizing in many states and regions has led to regionalization or clustering of extension programming (Laughlin and Schmidt, 1995; Rockwell et al., 1993). The concept of regionalization, or multi-state

programming, involves the sharing of extension expertise without regard to state boundaries (Carter, 1990). Regionalization may occur when agricultural industries are too small in a state to support the use of state or federal resources for a full-time extension specialist or educator. Regional programming may be most effective if adjacent states have a limited number of extension specialists (Casey, 1990). Regionalization of extension is not a new concept; it has existed for many years in areas of agricultural specialization, such as poultry science (Boyle, 1990; Havenstein, 1998; Reynnells, 1990). Additionally, regional projects such as handbooks and guides have involved collaborations among U.S. extension specialists and educators in the Pacific Northwest (DeAngelis et al., 2000), Midwest (Krischik and Davidson, 2004), Southeast (McVay et al., 1994), and Northeast (Lopes and Stack 2004).

Although there are potential benefits to regionalization or multi-state programming, there are concerns that regionalization will accelerate the trend not to refill vacant positions (Havenstein, 1998). Clear communication among extension administrators across state lines is critical if regional extension programs are to effectively serve clientele. States need to address the following concerns and questions before getting involved in regionalized programming:

- How do extension specialists and educators justify traveling to another state? What will the home-state clientele think of "their" extension specialist or educator traveling to another state? Will home-state clientele feel they are being neglected?
- Which state(s) will provide funding for operational expenses? How can these expenses be shared? How will operational funds be allocated among states? Which state is responsible for monitoring regional programs?
- Will regionalization lead to increased workloads that affect extension and research programs?
- How is accountability determined? How do extension specialists and educators receive credit or recognition for efforts from their home institution for out-of-state work? How will states deal with the evaluation process?
- Will implementing regionalized or multi-state programs increase travel

time requiring extension specialists to travel even longer hours, which may affect productivity?

Despite these concerns, regionalization can lead to favorable collaborations with other specialists and educators across several disciplines. Extension entomologists, horticulturists, and plant pathologists in Indiana, Ohio, Tennessee, and Wisconsin have collaborated in the production of regionally based extension publications concerning greenhouse pest management. University personnel from Illinois, Indiana, and Wisconsin produced a manual on biological control strategies that can be used in greenhouses (Mahr et al., 2001). Such regionally based extension publications that focus on a particular commodity, production system, or pest have been produced in other regions of the U.S. For example, extension specialists and educators in nine southern states have collaborated and produced a regional publication on the management of fire ants (Drees et al., 2002).

Regional workshops and newsletters have been developed for extension poultry programs in the Atlantic Coast and New England regions of the U.S. (Wyman and El-Begearmi, 1990) and also for turkey production programs in California (Ernst, 1990). Several states, including Oregon and Washington, have agreements that enable extension specialists to cross state lines and provide educational programming in neighboring states (Ernst, 1990). In fact, 36 states already rely on extension entomologists from other states for recommendations related to certain types of pest management programs (Gray and Steffey, 1998). Neighboring states will most likely continue this trend of utilizing extension specialists and/or educators for commodity-based meetings and provide support by covering expenses associated with travel, meals, and lodging; and include honorariums, as additional incentives.

The potential for success of regionalized extension programs depends in large part on the support of clientele. Extension specialists and educators should listen to their clientele regarding problems that are relevant to them. In addition, clientele and university extension professionals should decide collectively on a long-term (5 to 10 years) strategy to effectively meet the needs of clientele (Havenstein, 1998; Boyle, 1990). There must be strong

commitment of sharing personnel and resources to implement effective multi-state programs. In order to enhance the success of multi-state extension programs, it is important to identify common challenges for a geographical area and develop educational and research programs for that region.

Regionalization is already occurring informally through e-mail communication (listserves), telenet-working (latitude bridge systems), and teleconferencing. In fact, the use of communication systems such as e-mail (e.g., digital distance diagnosis) already has increased the likelihood of regional programming becoming a reality throughout the U.S. With more people having access to computer-based technology, compared to 10 years ago, the prospects of extension specialists and educators continually receiving requests through various modes of communication will most likely increase (Allen and Rajotte, 1990).

With universities facing budget constraints, and the fact that there are fewer extension specialists and educators in many states, it is probable that administration will contemplate the option of regionalizing extension programs in order to maintain financial stability (Gray and Steffey, 1998). Extension specialists should take a leadership role in addressing clientele needs within or out-of-state, rather than focus on administrative concerns. The implementation of regionalization or multi-state programming will provide opportunities for multidisciplinary extension programming, thus maintaining the integrity of extension to service clientele in a professional manner.

Impact of technology

Accelerating changes in communication and visual technology such as faxes, e-mail, and digital imaging have affected the time available to extension specialists and educators, and scheduling within a "typical" 8-h day. It has also reduced the time required for communication. Furthermore, due to computer access by clientele and the public, extension specialists and educators are now more accessible nationally and internationally than ever before (Siegrist et al., 1998).

Although face-to-face interactions are still popular among clientele, extension programs are using more

electronic formats to deliver information (King and Boehlje, 2000). In fact, for certain extension programs, audiovisual computer conferencing has replaced face-to-face meetings, which has reduced the amount of required travel to individual clients (Ezell, 1989; Simeral, 2001). However, web-based communication may sometimes require more time commitment per client than face-to-face presentations primarily due to setting up and testing the electronic equipment prior to use, and "breaking down" after completion of programming.

The use of web-based teaching or distance-education, for example by way of satellite instruction methods, saves travel time and costs (Kelsey and Mincemoyer, 2001). At the University of Illinois, interactive telenet-working delivered via latitude bridge educational system has been used to teach insect identification and insect management courses. Using this technology, it was possible to educate over 100 extension personnel and master gardeners throughout the state in one hour without leaving the confines of the university, which eliminated the time and costs associated with traveling and avoided program redundancy (i.e., giving the same program at several state-wide meetings). This type of technology is being used more frequently throughout many regions of the U.S. However, distance-education also can end up generating an endless volume of e-mails from homeowners, professionals, or educators that need an immediate response to a particular problem.

Despite the trend toward providing information on websites it is interesting to note that printed bulletins and fact sheets are still preferred sources of information (Rodewald, 2001), and presentations and workshops that actively engage attendees tend to be favored over mailed bulletins (R. Cloyd, personal observation). However, because clientele concerns generally need to be addressed quickly, and conferences and workshops may take months to schedule, the use of computer technology may be the preferred method of information delivery. Despite all the improvements in communication technology, extension specialists and educators are not likely to benefit from them unless they learn how to use them (Ezell, 1989). New technology is extremely useful for rapidly providing updated information

to clientele, such as availability of new pest control materials.

The e-Extension initiative, which is an effort coordinated by the Extension Committee on Organization and Policy of the National Association of State Universities and Land-Grant Colleges has proposed the development of an extensively coordinated national internet-based system. This electronic outreach delivery mechanism is designed so that extension specialists and educators can cooperatively develop and share educational information in order to more effectively serve new and current clientele (Extension Committee on Organization and Policy, 2004). When operational, the e-Extension system may prove invaluable to extension specialists and educators in allocating more time to high priority tasks as opposed to time spent on redundant tasks, such as answering repetitive phone calls.

Demand for expanding expertise

Extension specialists and educators need to expand their expertise in order to deal with issues including the effects of the Food Quality Protection Act, genetically modified organisms (GMOs), groundwater contamination, vector-borne diseases such as west Nile virus, and the constant influx of invasive species. For example, the introduction of invasive organisms, including insects such as the asian longhorned beetle (*Anoplophora glabripennis*), emerald ash borer (*Agrilus planipennis*), soybean aphid (*Aphis glycines*), gypsy moth (*Lymantria dispar*), and fungal pathogens (such as *Ralstonia solanacearum*), is a complicated issue that requires time to appropriately research, digest, and effectively communicate to clientele. This involves obtaining fact sheets, accessing websites, and reviewing e-mails from various listserves. Although this may create an additional workload, extension specialist and educators will remain abreast of the status of these important issues and can competently transfer this information to clientele.

Extension specialists and educators can develop outreach programs, using available technology discussed previously, to increase awareness of the economic and ecological impacts of invasive species (McReynolds and Howery, 2001). Effective extension programming could include: 1) accessing global information systems

(GIS) including databases that provide information on the impact of invasive species; 2) using these databases and information sources to promote clientele awareness of invasive species problems (Ricciardi et al., 2000); and 3) providing clientele with advice on the management practices of invasive species (Kelsey and Mariger, 2002).

Extension specialists and educators need to take a proactive approach in dealing with the challenges to extension and the needs of clientele. It is critical to demonstrate and document the impact of our programs and take advantage of multi-state programming by developing partnerships with other extension specialists and educators. In addition, extension specialists and educators must develop and conduct extension programs using the newest technological innovations and expand expertise by keeping abreast of current issues that may affect our clientele. Extension specialists and educators will more effectively serve clientele, justify the importance of extension programming, demonstrate extension as a valued resource to administrators, and deal with the challenges of financial constraint existing now and in the foreseeable future by documenting impact, using multi-state programming, adopting new technology, and keeping up with current issues.

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