The Role of the Extension Economist in Interdisciplinary Programs

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The focus of Extension has traditionally been on agricultural production and not on the full food system. We will need to describe food systems in broader terms than we have in the past as we address the issues of health and the environment. The inclusion of access to inputs, disposal and recycling as areas of concern will lead to new clientele, new approaches to problem analysis, and new challenges in educational programs and funding. Agricultural economists may see a move away from the traditional division into farm management, marketing and public policy and an increasing emphasis on interdisciplinary research.

History of Interdisciplinary Programs

Interdisciplinary research has a long history in Extension but the particular examples vary widely across universities. In most cases collaborative research has been an accident of personalities.

However, several evolving issues have fostered interdisciplinary work. The first worth noting was the inception of integrated pest management (IPM). The fundamental treatise of IPM is that pesticides should not be applied unless they can be shown to be economically and environmentally sound. This radical approach to crop management should have led to the involvement of numerous agricultural economists in the development of pest control practices. Instead, agricultural economists developed increasingly sophisticated models for establishing an economic threshold that were increasingly impossible to apply in practice. The pest population equations and crop response equations were difficult, if not impossible, to develop from field trials.

The objective of maximizing profit has replaced maximizing yield as the primary goal of pest control in text books. However, most field research still reports only the differences in yield, resulting from alternative pest control methods and not the related cost or benefits in monetary terms.

The second event that fostered interdisciplinary programs was the farm crisis of the early 80's. Suddenly, economists were asked to develop programs to explain the crisis, help growers adjust, and if necessary, retool for employment outside of the ag sector. This brought the economist into the subject areas of the urban/rural interface and the importance of agriculture to rural communities. Finance became an important subject matter and ag lenders became primary clientele.

Most recently, the invention of sustainable agriculture has increased the demand for agricultural economists on interdisciplinary teams. As experts in resource allocation, economists are being asked to define the parameters of research and analyze alternatives from broad perspectives.

New Issues and New Clientele

The focus on health and the environment has lead to a number of new topic areas for Extension economists. Each of these has brought with it a broad clientele. The influence of special interest groups is stronger than ever and having a tremendous impact on the research and education agenda.

Food Safety. Food safety is a consumer driven constraint on the ag sector. It has lead to the development of new products and product differentiation. Labeling is critical to capturing new markets for pesticide free and residue free products. Post harvest handling which was once

a forgotten part of the food production process is now critical. Agricultural processors, shippers, handlers, and marketing firms are becoming important clientele.

Sustainable Agriculture. The public is making the connection that food safety issues are linked to environmental issues. From the demand for safe food and a clean environment has emerged the concept of sustainable agriculture. While a completely workable definition may never exist, the overall message is clear. We need to take responsibility for long run impacts of current production practices. This concern is being manifest in the private sector with the creation of specialty markets and in the public sector with increasing regulation of production practices and waste disposal. Clientele now include environmental auditors, private and public disposal and recycling firms and nontraditional growers.

Toxic Liability. Liability for toxic substances cleanup has become an increasingly important issue under the Federal Superfund law, CERCLA. Under current court decisions a lending agency that has the capacity to influence the business practices of a firm is a functioning partner in the firm and is responsible for cleanup of any toxic material discovered by EPA. Consequently, any agricultural lender making a production loan could be held responsible for toxic cleanup even when land is not held as collateral.

The recent court rulings have changed the way major banks conduct business and, in particular, the content of loan applications. Once again, the farmer is being asked for more information about the business.

For perhaps the first time, bankers and growers are on the same side of an issue and are trying to get legislation to exempt secured lenders from the Superfund law. Environmentalists oppose this change in interpretation because they feel that banks are in a good position to police their borrowers. They feel that putting the banks in jeopardy is probably resulting in better management of toxic substances at the farm level.

Disposal and Recycling of Ag Waste. The question of toxic substances liability inevitably leads to the problems of disposal. Under current law, even when you dispose of toxic substances legally, if a dump site is found to be out of compliance, you are responsible for your share of the cleanup. In other words, the toxic is yours for time in memoriam.

The recycling of agricultural waste is yet another issue. Perhaps the burning of rice straw is one of the best examples. Legislation concerning disposal may force changes in current production practices. Will these costs be absorbed by the producer or passed on to the consumer?

International Trade and Interstate Commerce. Regulation of pesticides has had important implications for international trade and interstate commerce. It is the general consensus of growers in California, Texas and Florida that the restrictions on pesticide use in the U.S. that are not imposed on growers in other countries have taken away their competitive edge.

This has not been born out by research done in Mexico and South America, however. Growers who rely heavily on export markets seem to be following EPA guidelines to assure that their product does not have any residues that will force their product to be turned away at the U.S. border. There are examples of this phenomena in Europe where Spanish producers follow German guidelines to assure entrance into the German market.

New Technology. The emphasis on sustainable agriculture and reduced pesticide use has created a demand for new technology. The economic feasibility is, of course, often the sobering influence on new ideas. For example, can we freeze dry corn? What is the cost compared to canned corn? Is there a market? Where should the corn be grown to have the

longest growing season and maximize capacity at the processing facility? What would be the impact on the fresh market?

New Approaches to Problem Analysis

The research agenda of the land grant colleges are being challenged by special interest groups. A call for on-farm research is particularly being heard from nontraditional growers. Organic growers in particular feel that the long run improvements to the soil tilth and fertility have not yet been realized at Experiment Stations or University lands. Further, the scale of most test plots is too small to capture the ecosystem benefits of organic production. In other words, the argument is that the scale and time frame of University research is not appropriate for organic or sustainable research and that it should be conducted on existing farms.

Enterprise analysis, which is the measure of the costs and benefits associated with a single enterprise, is appropriate for some farm level decisions related to food safety and the environment. However, in many cases, a whole-farm analysis is needed. In these cases the enterprise budgets serve as the building blocks for whole-farm analysis. It is important to realize, however, that several enterprise budgets added together does not constitute a whole-farm analysis.

Sources of data for the enterprise budgets remains a problem. Should field trials be used, survey data, case studies? Data typically maintained by agronomists conducting field trials is not adequate for development of enterprise budgets. First, the labor and equipment required for each operation is not typically recorded. Even if it were, the turning time on a small plot is much greater than even a small farm situation. Therefore, the time required cannot be extrapolated from the trial to a farm situation. Also, the equipment used in a field trial on University land is often a mix of University, county, and borrowed equipment. It does not add up to an equipment complement that is representative of a "real" farm.

Survey data is typically a snapshot of a situation in one year which may or may not be representative. This type of data has typically been used to generate averages but in order to estimate risk we need to look at the distribution of these numbers.

Case studies give interesting incites into alternative approaches to agricultural systems. However, they cannot be replicated and do not have controls for comparison. Nonetheless, they are extremely useful for designing future research.

Enterprise and whole-farm analysis ignore the impact of widespread adoption. In particular, what would be the impact on consumer prices and revenue at the farm gate? It is quite possible that an overall reduction in output would actually make growers better off. Of course, this would be dependent on the international trade situation.

A broader perspective on the food system would mean analysis using qualitative rather than quantitative measures. Criteria for analysis of the food system would include:

1. **Equitable** - Including equitable distribution of food. Hunger and social welfare are not closely linked to the ag agenda and less to the sustainable agriculture agenda.

2. **Ecologically sound** - Free market institutions may be keeping us from using some instruments for barriers to entry of environmentally unsound farming practices. GATT emphasizes free trade and not environmental management.

3. **Economically sustainable** - This requires a long planning horizon and macroeconomic analysis.

4. **Ethical** - This would include human ethics and the relationship of humans to habitat and other species.

Traditionally there have been very few Extension economists trained in natural resources economics or sociology. The emphasis has been on farm management and marketing. Do these new criteria imply a need for retraining or a change in emphasis of newly filled positions? The possibility of additional resources appears to be remote.

New Challenges in Education Programs

Extension's strength has been in attacking relevant problems and issues. As we respond to new issues and serve a broader clientele, we need to take a hard look at traditional Extension programs. If we are going to be more things to more people with the same or fewer resources, what are we going to do less of?

Tax schools have given Extension high visibility over the years and continue to be popular. Could the private sector take over this function? Perhaps the tax schools could become self supporting and structured more like continuing education classes.

Cost of production studies are a highly visible body of information provided to a broad clientele. They are also often included in commodity workshops. However, they are extremely labor intensive to produce. Should they be developed by Extension specialists or associates instead? What role should the county agent play?

New topics for Extension education will include handling toxic substances. This will entail safe procedures for application of pesticides, storage and disposal.

Traditionally, Extension education programs have been one day or half day seminars with a variety of speakers. We can no longer afford to spend six hours driving to give a fifteen minute talk. This is not feasible from a monetary standpoint nor in terms of time allocation. We can no longer afford to give talks without generating some form of written material.

Perhaps all education programs should be on a pay basis. This would introduce overhead costs in terms of registration and the handling of cash. It also would put Extension in the role of being a quasi continuing education institution. Holding longer conferences with more in depth coverage has been a successful model in many cases. It also creates overhead problems.

Delivery methods are also changing as we try to reach more people with fewer resources. These include videos, teleconferencing and more written material.

Factors Contributing to the Success or Failure of Interdisciplinary Programs

Ultimately the success or failure of interdisciplinary research and education depends on the ability of the collaborators to work together. There are several factors that contribute to good working relations.

It is critical that the agricultural economist be able to understand the vocabulary of the other disciplines involved in the project. This problem is intensified as the profession is increasingly from an urban background. Undergraduate degrees are rarely in other agricultural

sciences. An agricultural economist may inadvertently assume away something that other scientists have spent their lives proving.

Similarly, most production scientists do not have a basic understanding of economic principles or what economists really do. We need to undertake training of other specialists as well as county agents.

Administrators can foster interdisciplinary research but they cannot mandate it. Unfortunately, interdisciplinary research is often discouraged by the incentive system of the institution.

Funding is also a driving force for encouraging or collaboration. Recent LISA funding suggested the involvement of economists on the team. This led to at least the inclusion of the names of many agricultural economists on grant proposals.

Perhaps the most critical factor for success is the early involvement of the economist on the team. Nothing is more frustrating than being brought in at the end of a project and being asked to do an economic analysis. Invariably the right parameters have not been measured. For example, yield and quality measures of the crop are often absent when alternative pest control methods are being compared. Typically, only the effect on the target pest is recorded. The environmental effects in terms of movement of chemicals through soil are extremely difficult and expensive to monitor. Further, it is difficult to assign a value to this movement.

Certainly the model of faculty with research appointments doing research and Extension faculty delivering those research results cannot work. It is not relevant to the promotion process for research or Extension faculty. Further, it is not relevant to the organization of the Extension system. Collaboration among Extension and research faculty is often effective. However, faculty without Extension appointments have actually been penalized in certain universities for writing for a lay audience. Until the incentive system is changed, the Extension economist cannot expect the assistance of colleagues from his own department.

The danger of the move to issue based programing and interdisciplinary work is the degradation of the discipline of Agricultural Economics. In years to come we may not have departments but rather a collection of issues centers. In this case, we may not have a body of knowledge and research techniques to draw from. Perhaps we need to exert caution in emphasizing interdisciplinary programs. It may be best to leave it to the few who find a comparative advantage in that type of endeavor.

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