ENVIRONMENTAL QUALITY PROGRAMS: A CHALLENGE TO COLLEGES OF AGRICULTURE*

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Recently, agriculture has been severely criticized as a major contributor to environmental pollution. Why has it been singled out as one of the main targets of criticism? There are several reasons. Over 80 percent of the land area in the United States is used by agricultural and forestry interests. A farm population of 10 million persons (about 5 percent of the United States Population) controls the use of most of this land. The manner in which this land is used, directly or indirectly, affects 200 million other Americans.

Most of the surface water which flows into the lakes and streams of the nation flows from this land. Because agriculture is a major user of pesticides, herbicides and inorganic fertilizers, persons who use these surface water supplies for drinking water and recreation purposes are greatly concerned about possible chemical pollutants and soil erosion from these lands. This gives agriculture and farmers visibility in the public eye.

American society as a whole is one of the most receptive to new technological and scientific achievements. However, there is a limit to the rate at which Americans can absorb and accept technological advancements. The recent controversy over the potential adverse effects of DDT is just one example of events which have shaken consumer confidence in the wisdom and discretion of chemical use in agriculture.

Traditionally, colleges of agriculture have been at the forefront in identifying and dealing with emerging problems confronting agriculture. This is documented by dramatic increases in agricultural productivity in the 20th century. Also, the challenge of conserving our nation's soil and water resources was effectively met, quieting a national clamor which developed during the Dust Bowls of the 1930's.

Colleges of agriculture now find themselves in a somewhat unique and perhaps enviable position with respect to the environmental quality issues. They have an opportunity to be of service to society by taking the leadership through developing university courses and programs of study centered around controlling the quality of the environment.

Colleges of agriculture occupy this position primarily because: (1) supporting research tends to be problem oriented, (2) several existing courses in the various disciplines already cover many aspects of environmental quality, (3) the pool of highly trained scientists can contribute significantly to any such program, and (4) close working relationships make possible an interdisciplinary approach to environmental problems.

Others have suggested that research alone is not the complete answer for successful pollution prevention and control. In addition, a continuous flow of new ideas and new methods that only the younger generation can provide through adequate training and education is needed.[1] Accepting this, a real challenge, as we see it, becomes that of developing instructional programs that will appeal to a broad range of students interested in improving the environment. Colleges of agriculture are probably in a better position to effectively meet this challenge than any other similar administrative unit in our system of higher education.

Task Force Approach

To approach this challenge at the University of Kentucky, an Environmental Task Force within the College of Agriculture was appointed by the Dean. Membership consisted of at least one representative from each of the ten departments in the college. Members were then divided into three subcommittees to examine environmental problems from a socio-economic, biological, and engineering standpoint. To determine the current involvement in environmental quality programs, the Task Force inventoried the existing course offerings and research programs of the college. One thing that soon became obvious was that the college was already quite heavily involved in teaching and research programs pertaining to environmental quality. Forty research projects dealing with environmental problems were identified with several new projects under consideration. Based on the degree that the primary objective of each project was to study environmental problems, the projects were further classified (by the authors) as direct (26 projects) and indirect (14 projects). The direct projects dealt with the following topical areas: biological insect control, nutrients in plant production, pesticides, waste disposal, water quality, impact of migration on local environment, public services, and recreation. It is our contention that a viable research program is complementary to any instructional program in this area.

With respect to course offerings, 25 undergraduate and 11 graduate courses considered to deal with environmental problems were identified in the college. In addition, new courses in the environmental area are being considered for implementation by the various departments. Further examination of the undergraduate courses revealed 12 courses directly related and 13 indirectly relating to environmental problems.

Looking more specifically at the undergraduate courses, those considered to relate directly to environmental quality were offered in seven of the ten departments of the college – five in Agricultural Engineering, two in Agronomy and one each in Agricultural Economics, Horticulture, Plant Pathology, Veterinary Science, and Forestry. Those courses considered to be indirectly related to environmental quality were also offered in six, but not necessarily the same departments. Seven of these were found in Horticulture, two in Agricultural Engineering and one each in Agricultural Economics, Agronomy, Animal Science and Veterinary Science.

The next logical step for the Task Force, working with the Undergraduate Curriculum Committee, was to appraise these findings and suggest future directions for the program.

Undergraduate Environmental Quality Programs

Currently, we at the University of Kentucky have progressed to a point where serious consideration can be given to an undergraduate program in the area of environmental quality. What we have to say with respect to such a program, represents the authors' thinking and, thus, not necessarily that of the college's administration.

In the process of initiating an environmental quality program, careful consideration should be given to: (1) scope and type of program needed, (2) administrative organization, and (3) new or additional course needs.

Scope and Type of Program

The scope of an instructional program will most likely be determined by our view of the nature of the challenge. If we are provincial, thinking simply in terms of providing education and training primarily for agricultural students, one type of program will evolve. If, however, we view the challenge in a much broader context, a different type of program will be forthcoming. Given the scope of the environmental quality problem itself and the growing concern of students from all disciplines for man and his environment, we see the real challenge as that of developing a program to fit the needs of a cross section of our student body. Herein lies a unique opportunity for colleges of agriculture to provide leadership in developing an interdisciplinary program which may involve contributions from various other disciplines

[1] Duane Acker, "Education and Pollution Control", South Dakota Farm and Home Research, Vol. XXI, No. 2, Spring 1970, P. 3.

on campus.

The type of program itself will depend to a large extent on the needs of the target group of students. From the students' standpoint, are they interested in specializing or just becoming more knowledgeable about environmental problems? Is there a potential market for highly specialized individuals in this area or is the need for a more general understanding and approach to the problems? The commonality of the pollution problem to all segments of our economy suggests that the latter more nearly represents our existing needs. If so, the most logical type of program appears to be a somewhat flexible, broad based option, or minor, for existing B.S. degree programs.

Interdisciplinary programs of study, while not too numerous in colleges of agriculture, are not without precedence. The agribusiness option, with which most of us are familiar, represents a similar type of program. The agribusiness option was developed in response to an expressed need for training in business administration in combination with more specialized training in agriculture. Generally speaking, this option has been successful in meeting the needs of both students and employers.

There are several benefits that can accrue to colleges of agriculture willing to accept the challenge and provide the leadership in developing this type of inter-disciplinary program. First of all, it can demonstrate to the students across campus that the College of Agriculture can make a significant contribution to his general education. Secondly, an opportunity is provided for a careful examination of the extent to which agricultural production is a pollutant of our environment. While agriculture must share part of the blame, often criticism is based upon misunderstanding and emotionalism. In addition, benefits could accrue to our own students from the comingling with students from the various disciplines in the classroom learning situation. A program that would accomplish any of these could enhance the stature of the College of Agriculture on most any campus.

Administrative Organization

In an age of specialization, renewed emphasis is often given to the need for an interdisciplinary approach to today's complex problems. This is particularly true with respect to environmental quality programs. However, much less attention is given to the type of administrative organization necessary for effective coordination of the efforts of the various participants. As a result, many interdisciplinary programs are destined to failure from their inception.

The various methods used to administer such programs all have their limitations. Perhaps the most common method used today is a committee composed of representatives from the disciplines involved. This system has met with only limited success because of the obvious weakness and limitations inherent in the committee process.

A second alternative would be to center the administration of an environmental quality program in one of the existing colleges. Since the College of Agriculture would most likely contribute a relatively large proportion of the inputs for such a program, it would appear to be the logical choice if this method were used.

However, to keep an environmental quality program interdisciplinary in every respect and yet avoid some of the problems and weaknesses of the committee approach, a third alternative that merits consideration is the institute (a paper organization, if you please). This type of organization has proven effective in the administration of interdisciplinary research programs. Water Resources Research Institute is probably the most widely recognized example of this type of organization. While our experience with institutes has been largely in the research area, there doesn't appear to be any reason why they would not be equally effective as a facilitative organization for an instructional program.

Additional Course Needs

A third factor to consider is the need for additional courses. Agricultural colleges are probably ahead in the number of existing courses which could contribute to such a program. As mentioned earlier, an inventory of course offerings in our own College of Agriculture revealed a total of 25 courses relating in some way to environmental problems. When combined with similar course offerings outside the College of Agriculture, we found that a rather sizeable group of courses is at our disposal.

Having identified those courses dealing with environmental quality, how can they be utilized most fully by the student with an interest in environmental problems? How would these courses fit into the program of the student desiring to develop competency in this area? It seems unlikely that a student could take a majority of the courses most directly related to environmental quality, because many of the courses are upper level and there are prerequisites to be met. The breadth of these course offerings and the structure of most undergraduate programs would likely limit the number of courses that could be included in a student's program.

Because of this implied course-hour limitation, a word of caution is in order regarding the potential utilization of many of our current courses relating to environmental quality. While each may contain some relevant material a careful examination is necessary to determine its total contribution to a formal program. We must be somewhat selective. One alternative might be to integrate some of the material relating to environmental quality into one of the basic courses within each discipline. Animal production courses, for example, could include introductory material which would give the students an appreciation of the problems of disposing of production process by-products in a way which is not detrimental to the environment.

Nevertheless, most colleges of agriculture either have, or have access to, an almost unlimited course material from which to develop a worthwhile and attractive environmental quality program for students at the undergraduate level. The main problem appears to be that of determining how to most fully utilize these resources. Let us be equal to the challenge.

Left to right: Tony Razaitis, President, Interstate Publishing Company, Danville, Illinois; James L. Ahlrichs, Purdue University, recipient of the 1970 Ensminger-Interstate Distinguished Teacher Award; Grant Moody, Chairman of the Teacher Improvement and Recognition Committee.

Passing the gavel