

Addition Of An International Option To An Undergraduate Agronomy Program

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Abstract

The globalization of agriculture and life sciences is having far-reaching impact on all types of public and private institutions serving agriculture, including the colleges and universities of the world. With the increasing emphasis on the global nature of environmental concern, markets, and economy, a global component becomes a necessity in a curriculum. International trade, expanded agribusiness, agricultural development, and the global nature of environmental problems make an internalization of curricula a necessary goal for a department. The Department of Crop and Soil Environmental Sciences at Virginia Polytechnic Institute and State University (VPI & SU) began a move toward integrating international issues and perspectives throughout the departmental curriculum as well as developing a international option to prepare students for a global society. This paper introduces a sample international option, one that is currently in place at VPI & SU. The author was the primary architect of this program, but had considerable input from a departmental curriculum committee. The objective of this paper is to present a working model of how one department addressed the issue of globalization in a curriculum. The international option not only addresses food production with appropriate coverage of world production areas, but encourages students to pursue courses in language, economic geography and cultures of disparate regions. This curriculum attempts to expose a student to professional agricultural subjects from an international perspective.

Introduction

With the increasing emphasis on the global nature of environmental concerns, markets, and economies, a global component becomes a necessity in a curriculum. International trade, expanded agribusiness, agricultural development, and the global nature of environmental problems make an internalization of curricula a necessary goal for departments within colleges of agriculture and life sciences. Schneider and Litzenburg (1989) and Suter (1985) combine to list three major factors that have contributed to the globalization of agriculture and life sciences: 1) We no longer live in an isolated world. Agriculture and food policy decisions made in areas around the world, such as the Pacific Rim, the

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EEC or in Latin America may have greater impact on American agriculture than decisions made in Washington, DC., 2) Global competition has become a fact of life for food and fiber producers in the U.S., 3) An explosion of new knowledge and technologies in the agricultural, life, natural and environmental sciences has brought about the need for dramatic changes in curricular design, course content and faculty resources. The obvious solutions to the problem (global interdependence) are to: 1) internationalize existing curricula, 2) institute a new international curriculum, or 3) both. Two not mutually exclusive avenues may be followed. First, current course material can be complemented with an international component (McKenna, 1989). Second, new curriculum options can be developed that focus on international agriculture (Hamming and Rosson, 1989b).

The need for educators to keep pace with the changing needs of clientele was discussed in the *Nacta Journal* by Hamming and Rosson, (1989). They felt that there was much that could and indeed, should be done to improve higher education curricula to better serve students and potential employers. They felt this was especially true in addressing the international dimension of curricula. Groennings (1989) stated that the development of an expanded agenda and a new and reinforcing set of premises for an international education agenda is imperative. He suggests that a plan of action should consider: 1) Focus on the global economy with courses in liberal arts and general education, 2) Internationalize programs with the introduction of a foreign language, 3) Broaden the range of our students participating in exchange programs, 5) Link study abroad to home campus curricula, and 4) Develop long-term relationships with foreign institutions in various parts of the world.

The student should experience not only courses in language, economic geography, and cultures of disparate regions, but also courses in grain production with appropriate coverage of world production regions in areas of high and low consumption. Geographic variation in production problems, genetic diversity, and applied animal nutrition courses that cover the grain and protein ingredients used in animal rations need be addressed (Acker, 1989).

Recently, many universities and colleges, including colleges of agriculture have been examining the international aspects of their programs. Many institutions have concluded that internationalization is a priority. VPI & SU is one of these institutions. However, Henson and Noel (1989) report that curricular internationalization is not being emphasized

as vigorously in agriculture as in other fields. The addition of an international option within a curriculum is but one way to address internationalization in a college of agriculture and life sciences, but can be an important step in adding a global perspective. The objective of this paper is to provide one model for the development a strong international component in an Agronomy Department that will serve as a base for educating our young people for the beginning of the next century.

Curriculum Description

Communication Component

The ability to communicate effectively in both written and oral form are essential skills needed by students graduating from a university. Students in the international option are required to take public speaking and make a choice between technical or business writing. If the decision on the writing course is made by the student with the assistance of his or her advisor, and is related to the goals of the students program of study. Two semesters of freshman English are taken to satisfy the university core curriculum.

Computation Component

Agriculture is a technical science and computation skills are necessary part of the curriculum. Students in the International Agriculture Option are required to take two semesters of Calculus with Trigonometry. Essential to any program is a proficiency on the computer. Students have the option of taking Computer Literacy or Numerical Computation Techniques. The former stresses spread sheets and word processing, whereas the later stresses Fortran and programming. The student and advisor make the decision as to which to take based on the students career goals. To properly evaluate scientific data a basic knowledge of statistics is a necessary component of a students program of studies. All students in the International Agriculture Option are required to take Introduction to Statistics.

Humanities/Fine Arts Component

The university core curriculum requires two semesters of Humanities or Fine Arts electives. These requirements are for the completion of one intact sequence from a list of courses in different Humanities or Fine Arts subject matter. These subject areas include: Architecture, Art, English, Foreign Language, Humanities, Woman's Studies, Music, Philosophy, Religion, and Theater Arts. An example of a sequence that would complement an international program would be Introduction to Spanish Culture and Civilization and Introduction to Spanish-American Culture and Civilization. However a student currently enrolled in the International Agriculture Option chose to fulfill this core requirement with two courses in choral music and used that six hours as part of a minor in music. This is another place for the student/advisor interaction to structure the program to the needs and interests of the individual student.

Social Science Component

Six semester hours of Social Science are required by the university core. The International Agriculture Option requires an additional nine semester hours in this area. To fulfill the university core either two semesters of Economics

of Food and Fiber or Principles of Economics are required. The former is taught in Agricultural Economics and the later in the College of Business. The two remaining required courses are International Agricultural Development and Trade and Introductory Cultural Anthropology. Then a choice of one of three courses, Rural and Regional Development Policy, Natural Resource Economics, or Food and Agricultural Policy. Again the student and advisor have the flexibility to select the courses based on the students goals and ambitions.

Basic Science Component

One of the problems with a curricula like this one is the compromises that are necessary to allow the flexibility to include non-traditional courses in the program. The realization that the basic sciences are the background of a sound agricultural education, but that the International Agriculture Option student had to complete the course of study in four years made this the place for compromise within the curriculum committee and faculty. Two semesters of Principles of Biology, Two semesters of General Chemistry and the Laboratory, and one semester of Survey of Organic Chemistry are required. The substitution of two semesters of Organic Chemistry and Organic Chemistry Laboratory and a choice of General Physics or Elements of Physics is suggested for students planning to enter a graduate program. A student can decide with the council of his or her advisor to take the more strenuous organic chemistry and physics, or use those hours to broaden the international nature of the program. However the suggestion is made that if graduate school becomes part of the students goal, that these courses might be necessary at some future time.

Courses in Crop and Soil Environmental Sciences.

The second place for compromise is in the departmental courses. In the past, nearly every student was required to take most of the courses offered in the department. As was the condition in the basic sciences, everyone can not take all the courses, expand the curriculum, and still hold the program to 128 semester hours. International Agriculture Option students are required to take the two Introductory one hour courses, Introduction to Crop and Soil Environmental Sciences, Introduction to Crop and Soil Environmental Sciences Laboratory, and the one semester hour Senior Seminar. They take Soils and Soils Laboratory, World Crops and Cropping Systems, and the Environment, Soil Survey and Cartography, Soil Fertility and the Soil Fertility Laboratory, Forage Crop Ecology and Pesticide usage within the department. They then have the choice between Insect Pest Management and Weed Science giving them a total of 29 semester hours with the Department of Crop and Soil Environmental Sciences.

Foreign Language Requirement

The International Agriculture Option in the Department of Crop and Soil Environmental Sciences is the only option to require a foreign language. The curriculum committee decided that this was a necessary component to the program, and made the necessary compromises in both the basic sciences and in departmental course requirements to allow for a language component to the curricula. Four semesters of

a foreign language is required. The choice of language is made by the student and advisor, and again is dictated to the goals and aspirations of the student. Three language choices are suggested, Chinese, French, or Spanish.

Supporting Courses

Three supporting courses are required for the International Agriculture Option student. Two semesters of Introduction to International Studies and one semester of Seminar in International Studies are the core courses for a minor in International Studies. One semester of Soil and Water Resource Management in the Department of Agricultural Engineering is also required for all students in the International Agriculture Option. The student then has the choice of two packages of courses. The first group includes: Animal Physiology, Animal Nutrition, Animal Production and Animal Production Laboratory, or a second group including: Farming Systems Research and Development, Nutrition in International Development, and Integrated Pest Management. One package is focused on animal production and the other is more focused on crop production. This is but another way that this program can be structured to address the individual student.

Minor in International Studies

An additional feature of the International Agriculture Option is that the courses fulfill the requirements of a minor in International Development within the International Studies Program of the College of Arts and Sciences. Students in the International Agriculture Option in the Department of Crop and Soil Environmental Sciences are exposed to international development issues that address the interdependence of the people of the industrialized nations with the limited resource and primarily rural people of the developing world. The International Studies Program at VPI & SU provides an opportunity for students to examine the fundamental political and economic relationships within and among countries, become fluent in a language, and do further study that directs them towards international development. The minor in International Development is also listed on their formal transcript of the University. This provides an advantage for the employment of the graduate of this program.

Sample courses required for this minor are included in the typical four year course of study presented in this paper. Core requirements include two semesters of Introduction to International Studies and Seminar in International Studies. Then an additional three courses are chosen from production, resource, or nutrition courses. To a limited degree, by choosing courses, a student can further fine tune the International Development concentration by selecting courses within the production, resource management or nutrition areas. Examples of these are marked with an asterisk in the sample program included with this paper. More than the 18 semester credit hours necessary for a minor in International Studies are included in the sample to provide a more complete feel for the choices. Within the program of study the typical student have 12 semester credit hours of free electives and that would not have to be taken in either the major or minor area of concentration.

This program is an excellent example of cooperation between colleges within the university. To offer a program of this type, a good working relationship in curriculum development is imperative. An added bonus is the potential for increasing college enrollment. This broad interdisciplinary program exposes uncommitted Arts and Science students to the programs in the College of Agriculture, and presents an opportunity to attract some of these students into Agricultural programs (McKenna, 1989).

Summer International Internship

A summer international internship program is an essential part of the international agriculture option. The VPI & SU International Internship Program is an international student exchange program sponsored by the College of Agriculture and Life Science's Office of International Development. The program began in the summer of 1985 when five students spent the summer working on farms in Zambia with counterparts who were agricultural students at the University of Zambia. In subsequent summers, many more students have worked on farms and with wildlife programs in Kenya through collaboration with Egerton University, Njoro, Kenya. Students with an international interest in the Crop and Soil Environmental Sciences department have been involved in this program each year since 1985.

This program is for undergraduate students, preferably Juniors. A one-credit Study Abroad course is offered during the spring semester. The objectives of this course and the summer program are: 1) To gain an understanding of third-world food problems and grassroots agricultural development through personal experiences abroad, 2) To have cross-cultural experiences, promote understanding, and develop friendships, and 3) To develop an appreciation for and become aware of other cultures, traditions, and languages.

After an orientation program at VPI & SU and in the host country, students work at the grassroots level with projects designed to improve conditions in agriculture, forestry and wildlife, health and nutrition. After the students return to campus, they are expected to share their experience with other students and faculty through speeches, slide presentations, and interviews with news media.

The internship program was initiated through a grant from the Edward H. Lane Foundation on the behalf of the Landon Bell Lane Memorial Fund.

Support from other private foundations, private business and individuals are also solicited. Students from the Department of Crop and Soil Environmental Sciences usually receive support from the department to supplement other funding. This year two students in the International Option are involved in the program in Kenya. They have also been learning Swahili in preparation for their trip.

Sample Program

The following is a sample program of study for a student in the International Agriculture option in the Department of Crop and Soil Environmental Sciences at VPI & SU. The courses that count for the inclusion of a minor in International Studies are marked with an asterisk. All of those

marked are not required and some of the internationally oriented courses take the place of free electives. The internationally oriented courses are included to show the variety of offerings available. Only three, three credit courses are required as core courses for the minor. Nine semester hours from suggested electives complete the requirements for the

minor in International Studies with a concentration in International Development. Thirty six hours are marked with an asterisk in this sample program. These are all either required or suggested electives for the departmental International Agriculture option.

Summary

Recently, many universities and colleges, including colleges of agriculture, have been examining the international dimensions of their programs. Many institutions have concluded that internationalization is a priority. The faculty is the key element for internationalizing the agricultural curriculum. However, faculty members frequently think there is insufficient time or staff to include more international content in curriculum. This paper presents a working model of an international option within an agronomy program. The emphasis is directed toward including language training, comparative cultures, comparative economics, world production systems, human nutrition, and other topics to complement a traditional agronomic curriculum. This model is not presented as a finished product, but rather a working curriculum that is still being refined. Hopefully, this might provide a starting point for others.

Literature Cited

- Acker, D. 1989. Internationalizing Agricultural Curricula - Who Will Get it Done? In: *Educating for a Global Perspective: International Agricultural Curricula for 2005*. North Central Regional Curriculum Committee Project. University of Wisconsin, Madison, Wis. 1989.
- Groennings, S. 1988. "Public Policy and National Imperatives: The U.S. in the Global System - The Challenge of Competitiveness" *Institute of Higher Education*, University of Georgia, Athens, GA, 1988.
- Hammings, M. D. and C. P. Rosson III 1989. *Agricultural Curriculum: Whether an International Dimension*. *NACTA Journal* 33(2)36-39.
- Hammings, M. D. and C. P. Rosson III 1988. In: *Alternative Curriculum Patterns for Globalization of the Agricultural and Life Sciences*, including the Natural and Environmental Sciences. Summer Work Conference for Deans and Directors of Resident Instruction in Agriculture and Natural Resources, Resident Instruction Section, Division of Agriculture, National Association of State Universities and Land Grant Colleges. Colorado State University, Fort Collins, Colorado, July 17-21, 1989. p. 2.
- Henson, J. B. and J. C. Noel. 1989. Faculty and the Internationalization of the Agricultural Curriculum for the Year 2005. In: *Educating for a Global Perspective: International Agricultural Curricula for 2005*. North Central Regional Curriculum Committee Project. University of Wisconsin, Madison, Wis. 1989.
- McKenna, J. R. 1989. Globalization of a Course to Broaden a Curriculum and Attract Undergraduate Non-Majors. *Nacta J.* 33(4)8-11.
- McKenna, J. R. 1990. Development and Implementation of a recruiting strategy for an Undergraduate Agronomy program. *J. Agron. Educ.* 18(2): 65-69.
- Schneider, V. E. and K. K. Litzenberg 1989. *Agribusiness Education Evaluation Survey*. A Project of the National Agribusiness Education Project, The Lincoln Institute on Land Policy, Texas A&M University, College Station, TX, 1989.
- Suter, D. A. 1985. "Identification of Areas Where Shortfall of Agricultural Graduates will Likely Exist." A Report to the Resident Instruction Committee on Organization and Policy, U.S. Department of Agriculture, Washington, DC, 1985.

International Agriculture					
Course	Credit	Total Credit			
Semester 1	Freshman English	3	16		
	Calculus w/Trigonometry 1	3			
	Principles of Biology	3			
	Economics of Food/Fiber	3			
	Humanities/Fine Arts Elective	3			
Introduction to CSE	1				
Semester 2	Freshman English	3			
	Calculus w/Trigonometry 2	3			
	Principles of Biology	3			
	Economics of Food and Fiber	3			
	Humanities/Fine Arts Elective	3			
Introduction to CSES Laboratory	1				
Semester 3	Computer Literacy	3		16	
	General Chemistry	3			
	General Chemistry Laboratory	1			
	Chinese, French, or Spanish	3			
	Intro to International Studies* 1	3			
	Animal Production*	2			
Animal Production Lab*	1				
Semester 4	Introduction to Statistics	3	16		
	General Chemistry	3			
	General Chemistry Lab	1			
	Chinese, French, or Spanish	3			
	World Crops and Systems*	3			
Intro to International Studies 2*	3				
Semester 5	Technical Writing	3			16
	Int'l Agr Development Policy*	3			
	Soils	3			
	Soils Laboratory	1			
	Chinese, French, or Spanish	3			
Seminar in International Studies*	3				
Semester 6	Public Speaking	3		16	
	Survey of Organic Chemistry	3			
	Soil Survey/Cartography	3			
	Chinese, French, or Spanish	3			
	Pesticide Usage*	3			
	Study Abroad	1			
Semester 7	Soil/Water Resource Management	3	16		
	Weed Science	3			
	Nutrition in Developing Countries*	3			
	Farm Systems Research/Dev*	3			
	Man and Environment*	3			
Senior Seminar	1				
Semester 8	Soil Fertility/Management	3			16
	Soil Fertility/Management Lab	1			
	Forage Crop Ecology	3			
	Insect Pest Management	3			
	Rural/Regional Development Policy*	3			
	Intro to Social Anthropology*	3			
Total		128			

* Required and suggested courses for a minor in International Studies

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