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# A Survey: Student Interest and Knowledge of International Agriculture

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## Abstract

A survey was conducted of 277 students enrolled in Agronomy courses at the University of Nebraska to determine their knowledge and interests in international agriculture, world demographics, trade, environmental issues, crop origin and comparison of U.S. agriculture to that of other countries. This provided background information to formulate changes in field crop management courses. Less than 50% of undergraduate students knew the correct answers to most questions, indicating the need to increase the international knowledge base of students. Students were asked to rank their interest in crop production in foreign countries, international marketing and trade, agricultural concepts of the future and environmental issues and 4 subtopics within each of these topics. Agricultural concepts of the future were of greatest interest to agronomy, animal science, agricultural education and general agriculture majors, international trade and marketing to agricultural economics, mechanized agriculture and agricultural communication majors, and environmental issues to natural resource majors. These differences among majors may be an important consideration when attempting to increase the international perspective of university courses in agriculture.

## Introduction

Many recent studies have shown a need for increased global awareness and knowledge for college of agriculture graduates (Brandt, 1987; Moos, 1982; Scully, 1985; Merritt, 1984; Kellog, 1984; Bjoraker, 1987). Economic development and U.S. agriculture is becoming increasingly global, and our lives and professional careers exist in an increasingly pluralistic, many-nationed, interdependent world (Moos, 1982; Sharp, 1988). Hammig and Rosson (1988) noted that curricular globalization could occur by altering existing curricula and courses, or by instituting a new international curriculum. Brandt (1987) strongly supported development of a few specialized international courses, with an equal emphasis on

bringing an international dimension into all courses in order to reach all students.

This survey was conducted to assess the knowledge and interests of students enrolled in agronomy courses for their knowledge and interests in international agriculture. This information can be used to help formulate specific changes to increase the international perspective of field crop management courses and agriculture curricula.

## Survey Methods

In support of efforts to increase the international perspective of a sophomore-level field crop production course the instructor recruited five undergraduate agronomy majors to prepare and administer a survey to assess student knowledge and interest in international agriculture topics. The international knowledge section contained questions about world demographics, trade, environmental issues, crop origin and comparison of U.S. agriculture to that of other countries (Table 1). In the international interest section, students were asked to rank a list of four topics based on their interest, and a list of four subtopics within each topic, as presented in Table 2. The questions used were developed by the students and instructors, based on reading of resource material on international agriculture, and interviews of people with much international experience. The survey was administered to 277 students enrolled in undergraduate agronomy courses during the 1990 spring semester. The international knowledge section was administered also to 37 Department of Agronomy faculty members.

Comparisons were made among academic majors and of students with faculty using chi-square tests. At the time of the survey, natural resource majors were largely interested in forestry, fisheries and wildlife. Other present natural resource majors in soil science and range management were grouped with agronomy majors. Student major differences were not detected; thus only student versus faculty results are presented. The effects of topics, subtopic and major on international interest were determined using a completely randomized design with split plot treatment arrangement. Major was considered to be the whole plot factor, and topic (or subtopic) as the split plot factor. Each student's response was considered to be an experimental unit.

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## International Knowledge

No differences in international knowledge scores were found among the nine College of Agricultural sciences and natural resources majors. The Department of Agronomy faculty had a higher percent correct answers than students on ten out of fourteen questions (Table 1). Less than 50% of undergraduate students knew the correct answer to eight out of the fourteen questions, and only a question about U.S. food supply was answered correctly by more than 75% of the students. Over 75% of the faculty correctly answered questions about efficiency of land use, origin of crops, and agribusiness ownership. Less than 25% of both students and faculty correctly answered questions about world population growth, amount of U.S. government foreign assistance and the degree of U.S. agricultural imports. These results suggest the need for efforts to improve international agriculture knowledge of students whose professional careers will be spent working in a global world economy (Brandt, 1987; Moos, 1982; Scully, 1985; Merritt, 1984; Kellog, 1984; Bjoraker, 1987).

## International Interests

Table 2 lists topics and subtopics used in the International Interest Survey. The interest ranking of international topics varied among majors in the College of Agricultural Sciences and Natural Resources (Table 3). "Agricultural Concepts of the Future" was the topic of greatest interest to agronomy, animal science, agricultural education and general agriculture majors which tend to emphasize crop and animal management (Table 4). "International Trade and Marketing" was of greatest interest to agricultural economics, mechanized agriculture and agricultural communication majors, while "Environmental Issues" were of greatest interest to natural resource majors. "Crop Production and Foreign Countries" was the topic of least interest for seven majors, while mechanized agriculture and agricultural communication majors ranked "Environmental Issues" of least interest. This suggests that the inclusion of these three distinctly different topics in a course with broad based major enrollment would be necessary to interest students of all agriculture and natural resource majors. High

**Table 1. Student and Department of Agronomy Faculty Responses to International Knowledge Survey (correct answer in bold).**

Question	Percent Correct Answers		Chi-Square Probability Level*
	Students	Faculty	
1. There is presently enough food produced to feed the entire world's population? <b>A. Yes</b> B. No	77	84	0.44
2. What percentage of the world's population by the year 2000 will be in developing countries? A. 40-50 B. 60-70 C. 70-80 <b>D. 80-90</b>	9	11	<0.01
3. What percentage of the federal government's budget goes to nonmilitary foreign assistance? <b>A. &lt;1</b> B. 1-4 C. 4-8 D. 8-12	9	24	<0.01
4. What percentage of American's income goes to the purchase of food? A. 6-11 <b>B. 11-18</b> C. 18-24 D. 24-28	31	65	<0.01
5. Are U.S. farmers the most efficient users of land in the world? <b>A. Yes</b> B. No	57	91	<0.01
6. Who is the world's largest exporter of rice? A. China B. Japan C. India <b>D. U.S.A.</b>	31	68	<0.01
7. The U.S. ranks ___ in agricultural imports in the world? A. 1 B. 2 <b>C.3</b> D. 4 E. 5	24	24	0.44
8. Where did corn (maize) originate? A. Jamaica B. Malaysia <b>C. Mexico</b> D. United States	65	97	<0.01
9. Where did grain sorghum originate? A. United Kingdom B. Colombia C. China <b>D. Ethiopia</b>	24	95	<0.01
10. The country with the highest per capita beef consumption is: A. South Korea B. United States <b>C. Belgium</b> D. Argentina	28	65	<0.01
11. Which country has the greatest total milk production? A. Canada B. Germany <b>C. United States</b> D. U.S.S.R.	57	59	0.29
12. In the past century the 5 warmest years have occurred in which decade? A. 1900's B. 1930's C. 1950's <b>D. 1980's</b>	70	54	0.10
13. Over the next 50 years the earth's temperature will probably: A. Decrease B. Remain the same <b>C. Increase 1-4°F</b> D. Increase more than 5°F	63	74	<0.01
14. Which of the following companies is not foreign owned? <b>A. Dupont</b> B. Ciba-Geigy C. ICI Americas D. Allis Chalmers	48	94	<0.01

\* Chi-Square probability level of responses for student-faculty comparisons.

coefficients of variation suggested that considerable variation in interest also existed for students within majors (Table 3). Historical class survey information indicating which majors were predominately present in a particular course would help instructors focus on the most useful topic(s) to use to incorporate an international perspective. Further information about individual student interests would also be useful, but time consuming to obtain and analyze.

The interest ranking of subtopics listed under the international topics "Crop Production in Foreign Countries", "International Marketing and Trade" and "Environmental Issues", was similar for all majors as indicated by the lack of significant Major x Subtopic interaction (Table 3). The subtopic "Crop Production in Europe" was of more interest than other subtopics listed under "Crop Production in Foreign Countries" (Table 5). The subtopics "Foreign Ownership of Agribusiness in the U.S." and "Farm Programs/Competitiveness in World Markets" were of great-

**Table 2. Topics and Subtopics Used in the International Interest Survey**

Topics	Crop Production in Foreign Countries	International Marketing and Trade	Environmental Issues	Agricultural Concepts of Future
Subtopics	Crop Production in Europe	Foreign Ownership of Agribusiness in the U.S.	Global Warming	Degradation of Agricultural Lands
	Crop Production in China	Farm Programs/Competitiveness in World Markets	Pesticide Use	Sustainable Agriculture
	Crop Production in Argentina	Marketing Practices	Ground and Surface Water Contamination	Farming Technology in 20 Years
	Evolution of Cropping Systems	Grain Quality in the World Market Place	Soil Erosion	Biotechnology

**Table 3. Analysis of Variance Probability Levels for International Interest Survey.**

Source of Variation	df	Subtopic within Topics				
		Among Topic	Crop Production in Foreign Countries	International Marketing & Trade	Environmental Issues	Agricultural Concepts of the Future
Major (M)	3	0.03	0.13	0.02	0.39	0.13
Error a	267					
C.V. (%)		18	22	20	22	27
Topic (or Subtopic) (T)	3	<0.01	<0.01	<0.01	<0.01	<0.01
T x M	24	<0.01	0.21	0.59	0.03	0.06
Error b	799					
C.V. (%)		48	49	48	49	50

**Table 4. International Major by Topic Interaction Effects on the International Interest Survey (Ranked by 1 = Most Interest, 2 = Second Most Interest, 3 = Third Most Interest, and 4 = Least Interest).**

Major	n	Crop Production in Foreign Countries	International Marketing & Trade	Environmental Issues	Agricultural Concepts of the future
Agronomy	43	3.0	2.6	2.6	1.9
Agricultural Economics	57	3.1	1.9	2.9	2.1
Animal Science	51	2.9	2.4	2.6	2.0
Natural Resources	40	3.0	2.8	1.6	2.3
Agricultural Education	22	3.0	2.7	2.3	1.9
Mechanized Agriculture	10	2.6	1.8	3.2	2.4
General Agriculture	29	2.9	2.4	2.7	1.8
Agricultural Communication	9	2.4	2.0	3.1	2.4
Other	14	3.1	2.9	2.2	2.5
Mean	277	2.9	2.4	2.6	2.1

**Table 5. Student Ranking of Crop Production in Foreign Countries and International Marketing and Trade Questions on the International Interest Survey (Ranked by 1 = Most Interest, 2 = Second Most Interest, 3 = Third Most Interest, and 4 = Least Interest).**

Crop Production in Foreign Countries Subtopics	Rank	International Marketing and Trade Subtopics	Rank	Environmental Issue Subtopics	Rank
Crop Production in Europe	2.1	Foreign Ownership of Agribusiness in the U.S.	2.1	Global Warming	2.6
Crop Production in China	2.6	Farm Programs / Competitiveness in World Markets	2.2	Pesticide Use	2.5
Crop Production in Argentina	2.8	Marketing Practices	2.6	Ground & Surface	2.0
Evolution of Cropping Systems	2.6	Grain Quality in the World Market Place	3.0	Soil Erosion	2.6

\* No Major x Subtopic interaction occurred, thus rankings are mean of all majors.

est interest under the topic "International Marketing and Trade", whereas "Ground and Surface Water Contamination" was of greatest interest under the topic "Environmental Issues".

Major x Subtopic interaction means for "Agricultural Concepts of the Future" showed that "Farming Technology in 20 Years" was ranked highest by all majors except for Natural Resources majors (Table 6). Natural Resources majors ranked this topic of least interest. This contrast in interest is an important consideration for courses with sizeable enrollment of both traditional agriculture majors and natural resource majors.

### Conclusion

This survey indicated that students enrolled in agronomy courses need more exposure to international topics. How-

ever the topics of most and least interest varied among majors, and this should be considered in efforts to incorporate an international dimension. Since over 75% of students enrolled in the field crop management courses at the University of Nebraska were agronomy, agricultural economics, animal science and general agriculture students, a three class-period on "crop production in a global market" was instituted in a sophomore-level crop management course as a step to increase international content of the curriculum.

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**Table 6. Agricultural Concepts of the Future by Major Interaction Effects on the International Interest Survey (Ranked by 1 = Most Interest, 2 = Second Most Interest, 3 = Third Most Interest, and 4 = Least Interest).**

Major	n	Degradation of Agricultural Lands	Sustainable Agriculture	Farming Technology in 20 years	Bio-technology
Agronomy	43	2.6	2.7	1.9	2.9
Agricultural Economics	57	2.6	2.3	2.0	3.0
Animal Science	51	2.6	2.5	2.1	2.7
Natural Resources	40	2.1	2.5	2.6	2.3
Agricultural Education	22	2.5	2.8	2.2	2.5
Mechanized Agriculture	10	2.8	2.2	1.6	3.4
General Agriculture	29	2.2	2.5	1.8	3.1
Agricultural Communication	9	2.4	2.3	2.1	3.1
Other	14	2.3	2.6	2.1	3.0
Mean	277	2.5	2.5	2.0	2.9

**Table 7. Environmental issues by major interaction effects on the International Interest Survey.**

Major	n	Global Warming	Pesticide Use	Ground & Surface Water Contamination	Soil Erosion
Agronomy	43	3.0	2.5	1.8	2.3
Agricultural Economics	57	3.0	2.5	1.8	2.5
Animal Science	51	2.5	2.7	2.0	2.6
Natural Resources	40	2.2	2.6	2.0	2.5
Agricultural Education	22	2.7	3.0	1.8	2.5
Mechanized Agriculture	10	3.1	2.0	2.3	2.5
General Agriculture	29	2.9	2.3	2.2	2.2
Agricultural Communications	9	2.1	2.4	2.1	3.3
Other	14	2.2	2.5	1.9	2.6
Mean	277	2.6	2.5	2.0	2.6

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