# A Study of Agricultural Students in Missouri and Arkansas Non-land Grant Universities

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## Abstract

*This study examines characteristics and occupational choices of agricultural students in Missouri and Arkansas non-land grant universities. The most striking findings were not the differences between agricultural economics/agribusiness and basic agricultural science majors, but the similarities between the two groups. Of all occupation preferences included for evaluation, "farmer" rated the highest, with no significant difference between social and basic science majors. Surveyed students were of a very traditional nature and most planned to continue farming after graduation. Yet, these traditional students require training that will enable them to meet the changing demands of the agricultural industry.*


## Introduction

Enrollment in American institutions of higher education increased from 8.6 million students in 1970 to 12.5 million in 1987 (United States Department of Commerce, 1970-1989). Forecasts for the Fall 1997 semester are for decreases to 12.2 million students enrolled in United States institutions of higher education. The number of part-time students is expected to rise to 44.5 percent of the total enrollment. The decline in the number of high school graduates will not reach its low until 1998, and an extremely small and declining percentage of these prospective college students will come to campus with farm experience (Manderscheid, Lester V., 1988). Thus, the traditional pool of recruitable students for all disciplines, and particularly for agriculture, will continue to decrease. Improved recruiting techniques will be required if current enrollments of agriculture's traditional students are to be maintained. Larger percentages of this traditional pool will have to be encouraged to enter the agricultural discipline. The alternative to facing enrollment difficulties in this traditional pool is to recruit proportionally larger percentages of students from the "nontraditional", international, and minority student pool.

Enrollment in the United States' agriculture programs was especially high in the mid-1970s. There was a renewed interest in the environment and programs in agriculture, and enrollments grew to unprecedented levels until 1977-78 when they began to decline. Since that time, the overall interest in careers relating to agriculture has subsided and the urban/suburban students who constituted a significant portion of the previous increase no longer choose agricultural programs (Reisch, Kenneth W., 1984). Recent research indicates that many students intending to major in nonagricultural areas think most agricultural careers require extensive knowledge of farms and farming. Also, most students are under the contention that job opportunities in agriculture-related careers are declining and that most agriculture-related careers involve or require manual labor (Grace, 1990).

Because it is the only social science among a broad array of plant, animal, and technical disciplines, agricultural economics and agribusiness occupies a unique position in most agriculture programs.[1] As economic and technological changes have added to the complexity of United States agriculture, the relative importance of agricultural economics has increased (Adrian, Dunkelberger, and Molnar, 1981). In spite of the importance of agricultural economics and agribusiness students to non-land grant agricultural departments and colleges, and significance to the agricultural industry, little is known about the relationships between these students and students majoring in the basic agricultural sciences.[2]

Many factors influence a young person's decision to attend a particular university and his/her career choice. In recent years, agriculture has suffered from increasing negative publicity involving surpluses, drought, and severe financial difficulties associated with the production sector. However, many positive factors create a positive outlook for agricultural careers. The agricultural industry employs approximately 21 percent of the labor force in the United States. Twenty-five percent of the consumer expenditures are for food and clothing made from U.S. farm products, and the farm and food system contributes 18 percent of the nation's gross national product (Cramer & Jensen, 1988). Also, many articles now appear in the popular press emphasizing the growing shortfall of agricultural graduates (e.g., Iowa Farmer Today, 1989; Feedstuffs, 1989A; and Feedstuffs, 1989B). Individuals possessing knowledge of the technical aspects of agriculture and the ability to evaluate the social and economic ramifications of various marketing and sales alternatives are in particular demand.

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1. The term "agricultural economics and agribusiness" is used broadly to encompass those majors identifying with programs which perform similar social science activities in colleges and departments of agriculture, but possibly under different titles.

2. Basic sciences majors include: general agriculture; horticulture; agronomy; and plant, soil, animal, dairy, and poultry sciences.

## Statement of the Problem

The challenge for colleges and departments offering degrees in agriculture is to meet the future expertise needs of the agricultural industry by attracting and retaining capable individuals and providing them with the skills desired by employers. Agriculture departments offering undergraduate instruction need to refocus and redirect resources into pertinent categories. If faculty members are to have the ability to direct the student body to appropriate areas of interest, detailed information regarding students is necessary. A better understanding of students as a human resource input could improve the colleges' and departments' management in such areas as student recruitment and retention, course development, and curriculum design. This understanding will have the potential to enhance the quality of educational program output.

## Objectives

The general purpose of this study is to compare and contrast Missouri's and Arkansas' non-land grant agricultural economics and agribusiness majors with students majoring in the basic agricultural sciences. The specific objectives are to: (1) examine the background characteristics, influentials, goals and aspirations of traditional agricultural students, and (2) compare and contrast the differences between two groups of students--agricultural economic and agribusiness students, and the traditional basic agricultural science students--in several areas: background characteristics, influentials, goals and aspirations.

## Methodology

Data were obtained from a survey of Missouri's and Arkansas' freshmen and senior agricultural students at nine state supported institutions[3] offering four- year degrees in the basic agricultural sciences. Letters were mailed, and telephone calls made to each department head. Seven-page questionnaires were dispensed to students in freshmen and senior agricultural courses at the nine institutions. Specific questions addressed agricultural students' personal and family backgrounds, high school and work experiences, desired and expected occupations upon graduation, and decision criteria and factors influencing their choice of a major. A Chi-square analysis was used to test the independence among variables associated with traditional agricultural students. Other data were summarized and are presented by percentages and averages.

## Results

Information from 565 respondents (401 from Missouri and 164 from Arkansas) are included in this report. Table 1 includes background information for all agricultural majors. As indicated, the majority of respondents were white males, with approximately three-fourths being in-state residents. Eighty percent of the students' fathers engaged in farming. An analysis of student involvement in high school agricultural organizations revealed that 57 percent were members of FFA, 27 percent belonged to 4-H, and 58 percent were involved in vocational agriculture. Respondents tended to be from farm backgrounds, and most planned to continue farming to some degree after graduation. Thus, the sample from these non-land grant universities was comprised almost exclusively of traditional agricultural majors.

The researchers were surprised to find that almost all students considered themselves full-time students. The respondents decided early in their high school careers to attend college. Before their junior year of high school, forty-four percent of the students had decided to attend college after completion of their secondary education. After obtaining their university degrees, approximately half planned on no additional degrees.

As shown in Table 1, categories marked with an asterisk indicate a significant difference in responses between agri-

**Table 1. Background Information of 565 Agricultural Majors in Four-Year State Supported Non-Land Grant Universities, Missouri and Arkansas, 1987.**

| Characteristic | Response (in percent) |
|---|---|
| Male | 83.54* |
| Female | 16.46 |
| RaceWhite | 96.34 |
| Black | 2.67 |
| Other | .99 |
| In-State Residence | 77.72* |
| Farm Reared | 84.70 |
| FFA | 57.35* |
| 4-H | 27.13 |
| Vocational Agriculture | 58.41* |
| Father a Farmer | 80.35* |
| Live or Lived on a Farm | 84.66 |
| Plan on Farming | 74.23 |
| Farming Only Source of Income | 26.96 |
| Full-Time Student | 95.92 |
| Classification: | |
| Freshman | 19.61 |
| Sophomore | 17.29 |
| Junior | 25.31 |
| Senior | 32.98 |
| Graduate Student | 4.81 |
| When Decided to go to College: | |
| Before status as a High School Junior | 44.12 |
| High School Junior | 16.46 |
| High School Senior | 22.06 |
| After Graduating High School | 17.36 |
| Plans for Additional Degrees: | |
| None | 50.37 |
| Another Undergraduate Degree | 6.58 |
| Graduate Degree in Agriculture | 31.14 |
| Graduate Degree not in Agriculture | 5.13 |
| Professional Degree | 6.78 |

* Chi-square significant at .05 level for difference between agricultural economics/agribusiness majors and basic agricultural science majors.

3. Institutions participating in data collection were Arkansas State University, Arkansas Tech University, Central Missouri State University, Missouri Western State College, Northwest Missouri State University, Southeast Missouri State University, Southern Arkansas University, Southwest Missouri State University, and University of Arkansas, Monticello.

Table 2. University, Program, and Choice of Specific Major Influentials of 565 Agricultural Students in Four-Year State Supported Non-Land Grant Universities, Missouri and Arkansas, 1987.

| Characteristic | Mean^A | Characteristic | Mean^A |
|---|---|---|---|
| Important in University Selection | | Important in Selection of Specific Agricultural Major | |
| Location | 3.9 | Career Interest | 4.1 |
| Tuition | 3.3 | Job Opportunities | 3.1 |
| Reputation of Agri Dept | 3.3 | Parents | 2.6 |
| Specific Degrees Offered | 3.0 | High School Vocational Agricultural Teacher | 2.1 |
| Family | 2.9 | Relatives | 2.1 |
| Reputation of University | 2.8 | College Catalog | 2.0 |
| Future Job Placement | 2.6 | Aptitude Tests | 1.9 |
| Faculty on Staff | 2.6 | College Friends | 1.9 |
| Friends | 2.6 | Representative from Agri Department | 1.8 |
| Job Related Experience | 2.2 | Pamphlets from Agriculture Department | 1.8 |
| Scholarships | 2.1* | Letters from Agricultural Department | 1.7 |
| Collegiate Extracurricular Activities | 2.0 | Pamphlets from University | 1.7 |
| Undergraduate Research Opportunities | 1.8 | Letters from University | 1.7 |
| Cooperative Program | 1.7 | Extension Agents | 1.6 |
| High School Teacher | 1.6 | Representatives of Universities | 1.5 |
| High School Counselor | 1.5 | High School Friends | 1.5 |
| Intercollegiate Judging | 1.4* | Tour of Campus | 1.5 |
| Important in Agricultural Program Selection | | Alumni | 1.4 |
| Area Seemed Interesting | 4.0* | High School Counselor | 1.4 |
| Job Opportunities | 3.6 | High School Science Teacher | 1.3 |
| Family Background | 3.2* | Telephone Calls from Agricultural Department | 1.3 |
| Potential Salary | 3.0* | Comm College Counselor | 1.2 |
| Flexibility of Work Schedule | 2.8 | | |
| Difficulty of Curriculum | 2.2 | | |

(A) The following scale was used to answer the above characteristics: 5 - extremely important; 4 - very important; 3 - important; 2 - slightly important; 1 - not important.

(*) Chi-square significant at .05 level for difference between agricultural economics/agribusiness majors and basic agricultural science majors.

cultural economics/agribusiness majors and other agricultural majors. Agricultural economics/agribusiness majors tended to include a smaller percentage of females than other agricultural majors. Ninety percent of agricultural economics/agribusiness majors were male, while 23 percent of other agricultural majors were female. Eighty-four percent of social science majors were from in-state while 29 percent of basic science majors were out-of-state students. Agricultural economics/agribusiness majors were more involved in high school FFA and vocational agriculture than were basic agricultural science majors. Eighty-four percent of agricultural social science majors had fathers who farmed, while 74 percent of other agricultural majors had farming fathers.

Table 2 indicates the importance placed by respondents on factors that influenced selection of their respective universities, programs, and specific agricultural majors. The three most influential factors at the university level were location, tuition cost, and reputation of the agricultural department. Although all agricultural majors indicated that scholarships were only slightly important, these funds tended be even less important to agricultural economics/agribusiness majors. Intercollegiate judging teams were also less important to social science majors.

When considering the selection of agriculture versus non-agriculture program emphasis, "area seemed interesting" was the highest ranking characteristic (mean = 4, very important), followed by "job opportunities," "family background," and "potential salary" (3.6, 3.2, and 3.0, respectively). There were also significant differences between students majoring in the social sciences and those majoring in the basic sciences for three of the top four characteristics. When examining frequencies, "family background" and "potential salaries" were clearly more important to agricultural economics/agribusiness majors, while "area seemed interesting" was ranked higher by agricultural science majors. Next, the factors influencing selection of a specific agricultural major, were examined. Without exception, results indicated no significant differences between students majoring in agricultural economics/agribusiness and the basic agricultural sciences. "Career interest" and "job opportunities" possessed the highest means (4.1 and 3.1, respectively).

Table 3 indicates the occupational preferences of agricul-

Table 3. Occupational Preferences of 565 Agricultural Students in Four-Year State Supported Non-Land Grant Universities, Missouri and Arkansas, 1987.

| Occupation | Mean^A | Occupation | Mean^A |
|---|---|---|---|
| Farmer | 3.4 | Environment Control Specialist | 2.0 |
| Agribusiness Manager | 3.1* | Agricultural Photographer | 2.0 |
| Farm Mgt Consultant | 2.6* | Agricultural Chemical Sales | 1.9* |
| County Extension Agent | 2.5* | Meat Inspector | 1.9 |
| Cooperative Manager | 2.4* | Agricultural Lawyer | 1.8* |
| Fertilizer Sales | 2.4* | Pest Control Agent | 1.8 |
| Soil Conservationist | 2.4 | Weed Scientist | 1.8 |
| Crop Specialist | 2.4 | Plant Breeder | 1.8 |
| Credit/Loan Officer | 2.3* | Ag Market Reporter | 1.7* |
| Farm Appraiser | 2.3* | Nursery Manager | 1.7* |
| Farm Equipment Sales | 2.3* | Geneticist | 1.7* |
| Government Inspector | 2.3 | Equine Specialist | 1.7* |
| Agricultural Marketing Specialist | 2.2* | Food Product Development | 1.7 |
| Vocational Agricultural Teacher | 2.2* | Soil Chemist | 1.7 |
| Animal Nutritionist | 2.2* | Food Grader | 1.7 |
| Veterinarian Supply Sales | 2.2* | Securities Salesperson | 1.6* |
| Veterinarian | 2.2* | Agricultural Chemist | 1.6 |
| Grain Merchandiser | 2.2* | Golf Course Superintendent | 1.6 |
| International Agricultural Specialist | 2.1* | Meat Department Manager | 1.5 |
| Veterinary Assistant | 2.1* | Agricultural Attache' | 1.5 |
| Commodity Broker | 2.1* | Farm Newspaper Editor | 1.5 |
| Market Analyst | 2.1* | Water Supply Engineer | 1.5 |
| Quality Control Specialist | 2.1* | Poultry Scientist | 1.5 |
| Seed Analyst | 2.1 | Statistician | 1.4* |
| Embryo Transfer Specialist | 2.0* | Magazine Editor | 1.4* |
| Landscape Contractor | 2.0* | Food Processor | 1.4 |
| Commodity Grader | 2.0* | Bioengineer | 1.4 |
| Landscape Designer | 2.0* | Supermarket Manager | 1.3 |
| | | Peace Corps Volunteer | 1.3 |
| | | Agricultural Librarian | 1.2 |

(A) The following scale was used for occupational preferences: 5 - extremely interested; 4 - very interested; 3 - interested; 2 - slightly interested; 1 - not interested.

(*) Chi-square significant at .05 level for difference between agricultural economics/agribusiness majors and basic agricultural science majors.

tural majors. Highest average scores for the selected occupations included "farmer" as the highest choice and "agribusiness manager" as a close second. The lowest average scores were associated with "agricultural librarian, "peace corps volunteer," and "supermarket manager." Occupations in Table 3 marked with an asterisk indicate differences between scores given by agricultural economics/agribusiness majors and other agricultural majors. Occupations that were expected to be more interesting to social science majors tended to have a higher average score than those for other agricultural majors and conversely. Also, both groups gave high scores to the occupation of "farming" and low scores to "agricultural librarian," and so forth.

## Summary and Conclusions

A study was conducted to examine background characteristics and occupational choices of agricultural students in Missouri and Arkansas non-land grant universities. Surveys of freshman and senior agricultural classes at nine state-supported institutions offering four-year degrees in the basic and social agricultural sciences were completed in the Spring of 1987. The most striking results were not the differences between social science and basic science majors attending Missouri and Arkansas non-land grant agricultural institutions, but the similarities between the two groups.

Of all occupation preferences included for evaluation, "farmer" rated the highest, with no significant difference between social and basic science majors. With the exception of farmer and agribusiness manager, all student perception rankings of listed occupations fell below the "interesting" category. These results could be due to: students having specific occupations in mind and not willing to consider other alternatives; the participating non-land grant departments being small and possible not specialized enough to provide specific training for many of the listed occupations; perceived writing, speaking, and reading skills needed for many of the positions; or perhaps students not being exposed to the vast number of different occupations present in the agricultural industry. An extension of this research would be to evaluate land grant and non-land grant schools to determine if differences in students' career perspectives.

When comparing agricultural economics/agribusiness students to those in the basic agricultural sciences, there were no differences in the selection of agricultural majors; thus, one primary type of recruiting program should be quite acceptable for those departments or colleges trying to recruit additional students in both areas. Although basic science majors were influenced more than social science majors, both groups of agricultural majors viewed agriculture as an "area that seemed interesting." Thus recruiting strategies incorporating information emphasizing interesting aspects of agriculture are of paramount importance in recruiting the traditional students. When emphasizing the recruitment of agricultural economics and agribusiness majors, promotional materials on job opportunities and related potential salary information should be a prime strategy.

Student respondents were primarily from farm backgrounds and most planned to continue farming to some extent after graduation. Eighty percent of the students had fathers engaged in farming. This and other related information suggests that the current students in these nine non-land grant institutions are of a very traditional nature. The question of overall student quality continues to surface, particularly in non-land grant agricultural departments. Enrollments are relatively low, but demand by employers exceeds the available supply of qualified social and basic agricultural science graduates. Thus evaluation and refinement of current marketing and recruitment strategies need to be expanded if qualified "non- traditional" students are to seriously consider agriculture as a career and fill the qualified student shortage. Otherwise, traditional agricultural employers will continue to expand recruitment efforts in areas other than agriculture.

## References


Adrian, John L., John E. Dunkelberger, and Joseph J. Molnar, (1981) "Agricultural Economics Students at Southern Land Grant Universities," *Southern Journal of Agricultural Economics*, 13(1): 133-138.

Cramer, Gail L. and Clarence W. Jensen, (1985) *Agricultural Economics and Agribusiness*, John Wiley and Sons, New York.

Feedstuffs, (1989A) "Outlook for Ag Graduates Called Bright for 'Long Time'," March 20, p.6.

Feedstuffs, (1989B) "Agribusiness to Experience Continued Worker Shortage," December 11, p.6.

Grace, Teddee, (1990) "Misperceptions Cloud Students' Opinions of Agricultural Careers," *Choices*, First Quarter, p.31.

Iowa Today, (1989) "Farm Youth with Ag Degree is Hot Commodity," December 23, p.2-B.

Manderscheid, Lester V., (1988) "Undergraduate Educational Opportunities in the Face of Declining Enrollments," *American Journal of Agricultural Economics*, 70(5): 985-993.

Reisch, Kenneth W., (1984) "Recruiting and Retention," *NACTA Journal*, 28(3): 27-31.

United States Department of Commerce, (1970-1989) Bureau of the Census, *Statistical Abstract of the United States*, Editions 91-109.