

## ATTITUDES OF COLLEGE OF AGRICULTURE FRESHMEN TOWARD AGRICULTURE

*James E. Dyer, Associate professor, University of Missouri*

*Lisa M. Breja, Coordinator of Admissions and Advising, Iowa State University*

*Randall J. Andreasen, Assistant Professor, Southwest Missouri State University*

### Abstract

*The primary purpose of this study was to assess the attitudes and intentions of university College of Agriculture freshmen toward high school and university agriculture programs and the field of agriculture. Results indicated that a majority of freshmen students were male, white, had agricultural experience, completed high school agricultural coursework, and possessed either a farm or rural background. Students agreed that high school agriculture courses were applicable to college preparatory programs and that these courses were good preparation for studying agriculture in college. They likewise agreed that all students should enroll in college agriculture courses. Ninety-seven percent of the students who had completed high school coursework planned on graduating with a degree in agriculture. Additionally, students who had completed high school agriculture courses expressed more positive attitudes toward university agriculture programs, high school agriculture programs, and agriculture as a career than did students with no high school agriculture experience. Students indicated that the most influential person in their decision to attend the College of Agriculture was their high school agriculture teacher.*

### Introduction and Theoretical Framework

Enrollment in agriculture programs at both the university and high school levels has undergone major changes over the past 20 years. From the peak numbers of the late farm enrollments at the high school level plummeted with the onset of the farm crisis in the late 1970s and early 1980s (Dyer & Osborne, 1994). In the two states whose economies are most closely tied to the agricultural sector, Illinois and Iowa, some of the most drastic changes were reported. In Illinois, agriculture program enrollments decreased during this period by over 60% from a total of 29,502 students enrolled in 397 programs to 11,733 students in 325 programs (Illinois State Board of Education, 1993). In Iowa, an enrollment of 17,293 students in 245 programs dwindled to only 9,161 students in 255 programs from 1976 to 1990, a decrease of nearly 53% (Iowa Department of Education, 1997). Over the

same time period, total enrollment in Illinois and Iowa public schools decreased by 25% and 20%, respectively, indicating that other factors were contributing to the attrition in agriculture program enrollments (United States Department of Education [USDE], 1996).

This enrollment crisis created a ripple effect that struck at the university level in the late 1980s. Manderscheid (1988) reported a 24% decline in Land Grant University agriculture enrollments and a 13% decrease in non-Land Grant University agriculture enrollments from 1978 to 1988. Paralleling this decrease in university agriculture program enrollments were cutbacks in faculty positions. According to the American Association for Agricultural Education (AAAE), university agricultural education faculty membership decreased from a 1984 high of 326 members to a 1995 low of 254 members, a decrease of 22% (AAAE, 1996).

As universities were responding to decreased numbers by downsizing agricultural education departments and programs, high school enrollments in agriculture courses were rebounding. Several states modernized agriculture curricula as suggested by the National Research Council (1988) and reaped almost immediate results in the form of increased student numbers. At an enrollment of nearly 12 million students in 1993 -94, high school enrollments are within 10% of the pre-recession enrollments of 13.6 million students, even with a national decrease of just over 20% in the number of school age children (USDE, 1996).

At the university level, colleges of agriculture are also reporting increased enrollments. Litzenberg, Whatley, and Scamardo (1992) reported that, with the exception of the North Central Region, agricultural enrollments had recovered to early 1980 levels. According to USDE numbers, 1992 enrollments in colleges of agriculture nationwide have increased by 18.9% over the 1981 enrollment of 802,000 students (USDE, 1996). However, the demographic composition of today's agriculture classes has changed from that of the 1980s. Scofield (1995) reported that 43% of students enrolling in the College of Agriculture at Iowa State University in the fall of 1994 were from urban backgrounds. According to Russell (1993), this lack of agricultural background and/or experience jeopardizes the long-term future of the agricultural industry. Russell warned of an impending "brain drain" in the agricultural industry, jeopardizing its long-term future if the loss to the agricultural industry of individuals trained and experienced in agriculture continues.

With an increasing number of freshmen coming from urban backgrounds and/or situations in which they have gained no knowledge of or experience in agriculture, new problems and opportunities have emerged. Colleges of Agriculture must provide information, not only in agriculture, but also about agriculture. However,

losses of enrollments translate into losses of dollars from instructional budgets. The needed resources to provide this instruction may not be available.

The problem addressed by this research was how to identify and retain students who are likely to complete a program of instruction and seek employment in the industry of agriculture. The conceptual model for this study emphasized the need to study those factors that influence a student's selection and pursuit of a field of study and corresponding career choice. Fishbein and Ajzen (1975) provided the theoretical framework for this study. They determined that intentions to participate in an activity could be predicted based upon knowledge, observation, or other information about some issue. This suggested that a person's intent to pursue study in a field of agriculture, or to become actively involved in an agricultural career, may be predicted by analyzing his/her beliefs about agriculture. Greenwald (1989) supported this theory, reporting that individuals with positive attitudes toward a subject or situation tend to evaluate them positively.

### **Purpose**

The primary purpose of this study was to assess the attitudes and intentions of university College of Agriculture freshmen toward high school and university agriculture programs and the field of agriculture. A secondary purpose was to investigate student attitudes about the role of agricultural educators. The study addressed the following questions:

1. What were the attitudes of College of Agriculture freshmen toward the field of agriculture and educational programs in agriculture?
2. What were the attitudes of College of Agriculture freshmen toward their major areas of study?
3. What was the influence of high school agriculture program experiences on the

attitudes of students who are now pursuing agricultural majors?

### Procedures

This study used a descriptive survey, which was administered to all freshmen in the 1996-97 class of the College of Agriculture at Iowa State University ( $N = 513$ ). A student roster from the College's admissions office served as the population frame for this census study.

Survey instruments were mailed during the 1997 spring semester with a follow-up postcard reminder mailed after two weeks. A second instrument packet and reminder postcard were mailed at two-week intervals, respectively. A total of 401 (78%) surveys were returned. A random sample of 10% of the non-respondents was contacted and completed the questionnaire via telephone. Summated means of these non-respondents were compared to early and late respondents with no significant differences noted, allowing generalization from the sample to the population.

The two-part questionnaire used in this study was developed by Dyer, Lacy, and Osborne (1996) and was reviewed for content and face validity by College of Agriculture staff at that time. Part I of the questionnaire addressed demographic information and contained close-ended and partially close-ended questions. Part II of the instrument was divided into three constructs: Attitudes Toward Agriculture as an Area of Study, Attitudes Toward High School Agriculture Programs, and Attitudes Toward University Agriculture Programs. These sections used a five-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree). Dyer, et al. reported reliability estimates for the three constructs using Cronbach's Alpha ( $r = .85, .78, .88$ , respectively). Data were analyzed using descriptive statistics, including measures of central tendency and variability.

### Results

A majority of student respondents was male (57%,  $n = 222$ ) and Caucasian (97.2%,  $n = 369$ ). African-American, Hispanic, and Asian ethnicity/ancestry were reported by five, four, and two students respectively (1.3%, 1.0%, and 5%) with an additional seven students (1.8%) reporting an ethnicity of "other."

Fifty-four percent ( $n = 214$ ) of the respondents reported having completed at least one high school agriculture course, 47% ( $n = 182$ ) indicated that they had been FFA members, and 55.2% had been involved in 4-H. Nearly two-thirds (62.1%) of those students who had completed high school agriculture classes rated the programs as "good" while only 7.5% rated the quality "poor."

Nearly half of the respondents ( $n = 188$ , 47.5%) had farm backgrounds. An additional 28.8% of the students were from rural areas (but not farms) or small towns (<10,000), with the remaining 23.7% of the students indicating their geographical backgrounds were large or medium-sized urban areas.

The majority of the respondents (66.4%,  $n = 263$ ) indicated they had both paid and unpaid experiences in agriculture. Forty-six respondents (11.6%) indicated unpaid work experience only, 22 students (5.6%) reported paid work experience only, while 65 students (16.4%) indicated they had no agricultural experience prior to enrolling in the College.

Sources of information cited as most helpful in informing students about the College of Agriculture and/or Iowa State University included brochures (32.2%) campus visits (24.0%) letters from staff (20.7%) phone calls (9.4%), and personal contacts from faculty (6.7%).

Research Question 1: What were the attitudes of College of Agriculture freshmen toward the field

of agriculture and educational programs in agriculture?

The attitudes of College of Agriculture freshmen toward the field of agriculture were generally positive. As indicated in Table 1, students viewed the field of agriculture as both

scientific and technical. They disagreed with the statement that only students with farm backgrounds should pursue agricultural careers ( $M = 1.55$ ). While less than half (45.9%) agreed that most people have a positive image of agriculture, 70.7% agreed that the image was improving.

Table 1. Attitudes Toward Agriculture as an Area of Study

Statement	Agree <sup>a</sup> f (%)	Uncertain f (%)	Disagree <sup>b</sup> f (%)
Agriculture is a scientific area of study.	371 (93.7)	19 ( 4.8)	6 ( 1.6)
Most people have a positive image of agriculture.	182 (45.9)	108 (27.3)	106 (26.7)
Agriculture is a highly technical field of study.	343 (96.7)	44 (11.1)	9 ( 2.3)
The image of agriculture is improving.	280 (70.7)	88 (22.2)	28 (7.1)
Only students with farm backgrounds should pursue careers in agriculture.	13 ( 3.3)	22 ( 5.6)	361 (91.1)

<sup>a</sup>The term “agree” includes the combined responses of “strongly agree” and “agree”. <sup>b</sup>The term “disagree” includes the combined responses of “strongly disagree” and “disagree.”

Respondents were very supportive of high school agriculture programs (Table 2). Over three-fourths (75.7%) of freshmen in the College of Agriculture agreed that more students should be encouraged to take high school agriculture classes. Accordingly, over two-thirds (68.5%) agreed that high school agriculture courses were applicable to college preparatory programs. A majority (58.7%) agreed that these courses were good preparation for studying agriculture in college. The students disagreed with the statements that that high school agriculture courses are better suited for male students and that only students pursuing careers in agriculture should enroll in high school agriculture.

Students generally believed that everyone would benefit from college course work in agriculture (see Table 3). Approximately two-thirds (66.1%) of the respondents agreed with the statement that more students should be encouraged to enroll in college agriculture

courses. Likewise, 66.7% of the freshmen disagreed with the statement that only students pursuing careers in agriculture should enroll in college agriculture courses. More than three-fourths (76.1%) of the students surveyed disagreed that college agriculture courses are better suited to male students.

Research Question 2: What were the attitudes of freshmen College of Agriculture students toward their major area of study?

Nearly all students indicated they were happy in the College of Agriculture. Only 5.9% of the respondents indicated they were planning a change of colleges (see Table 4) and only 6.5% intended to enroll in another university. Likewise, most respondents ( $n = 294$ , 82.7%) reported no intent to change majors. Thirty-one students (8.8%) indicated a definite plan to change of majors, whereas 30 students (8.5%) indicated a possible change.

Table 2. Attitudes Toward High School Agriculture Programs

Statement	Agreea f (%)	Uncertain f (%)	Disagree <sup>b</sup> f (%)
More students should be encouraged to enroll in high school agriculture programs.	299 (75.7)	76 (19.3)	20 (5.1)
College-bound students should be encouraged to enroll in high school agriculture programs.	271 (68.5)	95 (24.0)	30 (7.6)
High school agriculture is good preparation for college study in agriculture.	231 (58.7)	137 (34.8)	26 (6.6)
High school agriculture should become less vocational.	80 (20.3)	207 (52.5)	107 (27.2)
High school agriculture should become more scientific.	172 (43.6)	176 (44.7)	46 (11.7)
High school agriculture classes are better suited to male students.	65 (16.5)	104 (26.3)	225 (57.1)
High school study in agriculture is easier than in other subjects.	131 (33.4)	177 (45.0)	85 (21.6)
High school agriculture courses are beneficial for higher-achieving students.	151 (38.5)	197 (50.3)	44 (11.2)
High school agriculture courses are beneficial for lower-achieving students.	138 (35.0)	201 (51.0)	55 (13.9)
Most high school students should take some course work in agriculture.	240 (60.6)	102 (25.8)	54 (13.7)
Only students pursuing careers in agriculture should enroll in high school agriculture courses.	39 (9.9)	59 (14.9)	298(75.3)

<sup>a</sup>The term “agree” includes the combined responses of “strongly agree” and “agree”. <sup>b</sup>The term “disagree” includes the combined responses of “strongly disagree” and “disagree.”

Research Question 3: What was the influence of high school agriculture program experiences on the attitudes of students who are now pursuing agricultural majors?

A majority ( $n = 214$ , 54%) of the College freshmen reported course work in high school agriculture whereas 182 students (46%) reported no high school course work in agricultural education. Of those who did not complete agriculture course work, 68.7% did not have access to a high school program. The second

most cited reason was a conflict with college preparatory courses.

Almost all students ( $n = 197$ , 97.0%) from high school agriculture programs indicated that they intended to graduate from the College of Agriculture and pursue a career in agriculture. Only six students indicated otherwise. By comparison, 90.5% ( $n = 152$ ) of those students who did not enroll in high school agriculture programs indicated that they plan to graduate in the College of Agriculture. Sixteen students

Table 3. Attitudes Toward University Agriculture Programs

Statement	Agree <sup>a</sup> f (%)	Uncertain f (%)	Disagree <sup>b</sup> f (%)
More students should be encouraged to enroll in university agriculture programs.	261 (66.1)	112 (28.4)	22 ( 5.6)
College agriculture classes are better suited to male students.	19 ( 4.9)	75 (19.0)	300 (76.1)
College study in agriculture is easier than in most other subjects.	42 (11.9)	93 (23.8)	244 (64.30)
Most college students should take some course work in agriculture.	191 (48.3)	128 (32.3)	77 (19.5)
Only students pursuing careers in agriculture should enroll in college agriculture courses.	66 (16.6)	66 (16.7)	264 (66.7)

<sup>a</sup>The term “agree” includes the combined responses of “strongly agree” and “agree”. <sup>b</sup>The term “disagree” includes the combined responses of “strongly disagree” and “disagree.”

Table 4. College of Agriculture Freshmen Planning to Change Colleges and/or Majors

Major	N	Students contemplating change of college		Students contemplating change of majors	
		n	%	n	%
Agricultural Systems Technology	16	0	0.0	2	12.5
Agronomy	16	0	0.0	3	18.7
Animal Sci., Pre-Vet, Dairy Science	135	5	3.7	20	14.8
Horticulture, Turfgrass Management	25	0	0.0	4	16.0
Agricultural Studies	32	0	0.0	3	9.4
Agricultural Business	51	5	9.8	6	11.8
Genetics, Zoology	11	2	18.8	4	36.4
Agricultural Education	15	0	0.0	1	6.7
Agriculture-Undeclared	14	4	28.6	7	50.0
Forestry	12	1	8.3	4	33.3
Animal Ecology	18	3	16.7	1	5.6
Microbiology	13	2	15.4	3	23.1
Food, Nutritional Science	4	0	0.0	1	25.0
Public Service Administration	3	0	0.0	1	33.3
Environmental Science	1	0	0.0	0	0.0
Biochemistry	2	0	0.0	1	50.0
Totals	350	22	5.9	61	17.3

indicated their intentions to change colleges.

Of the 169 students who had been enrolled in high school agriculture programs and were also FFA members 166 (98.2%) indicated intentions to graduate with a degree in the College of Agriculture. Likewise, of the 198 students who had been 4-H members, 192 (97.0%) also indicated intentions to graduate through the College of Agriculture.

Students who had completed high school agriculture courses expressed more positive attitudes toward educational programs in agriculture (see Table 5). In addition, these students disagreed ( $\bar{M} = 1.62$ ) with the statement that only students with farm backgrounds should pursue careers in agriculture. Students with no high school agriculture course work strongly disagreed with the statement ( $\bar{M} = 1.43$ ).

Students indicated that the most influential person in their decision to attend the College of Agriculture was their high school agriculture teacher (20.0%), followed by high school guidance counselor (16.4%), sibling (10.9%), parent (7.3%), and friend (5.5%). For those students who had decided to transfer out of the college/university, most common influences were relatives/friends (25%), teachers (10%), perceived lack of job opportunities (10%), academic pressure (10%), and not feeling part of the program (10%).

### **Conclusions, Recommendations, and Implications**

Nearly all students indicated they were happy in the College of Agriculture. Less than 6% of the respondents indicated a likely change of colleges. These numbers contrasted sharply with those reported by Dyer, Lacey, and Osborne (1996). Dyer, et al. reported that nearly 40% of the freshmen class in the College of Agriculture at the University of Illinois at Urbana-Champaign intended to leave the College of Agriculture prior

to graduation. In addition, the researchers reported that nearly 50% of the University of Illinois freshmen intended to change majors within the College as compared to 17.3% at Iowa State. Why do students choose to remain in one college but leave another? Given the geographical and peer comparisons between the two institutions, further study should contribute to understanding students' rationale.

The College of Agriculture at Iowa State University continues to attract students with farm or rural backgrounds and who have completed high school agriculture courses. The researchers in this study found that the percentage of students coming from large or medium urban areas had declined from 43% in 1995 to 23.7% in 1996. This finding supports a recent article appearing in the Des Moines Register (Pins, 1997) which indicated that a "rural rebound" is occurring throughout the United States as three-fourths of the nation's 2,304 non-metro counties are growing. This is in contrast to growth rates in the 1980s when less than half of Iowa's counties experienced an increase in population. If the same phenomenon is occurring nationwide, this increase in population in rural areas should fuel enrollment and resources into colleges of agriculture and provide even greater demand for additional high school agriculture programs. Major efforts and support from universities should be expended in providing assistance in establishment of those programs.

High school agriculture programs are good investments by those interested in promoting agriculture. Likewise, graduates of these programs are good investments by colleges of agriculture. Students who have enrolled in high school agriculture, and those who were involved in FFA and/or 4-H, are more likely to complete a four-year degree in the College of Agriculture and choose agriculture as a career than are freshmen who have not had those experiences. The research indicated that 97% of students that enrolled in high school agriculture plan to graduate from the

Table 5. Comparison of Attitudes of High School Agriculture Program Versus Non-Program Graduates

Statement	No High School Agriculture		High School Agriculture	
	M	SD	M	SD
Agriculture is a scientific area of study.	4.37	.72	4.37	.61
Most people have a positive image of agriculture	3.19	1.00	3.28	.99
Agriculture is a highly technical field of study.	4.07	.72	4.19	.67
The image of agriculture is improving.	3.77	.82	3.87	.84
More students should be encouraged to enroll in university agriculture programs	3.63	.80	3.92	.81
More students should be encouraged to enroll in high school agriculture programs	3.73	.91	4.37	.77
College-bound students should be encouraged to enroll in high school agriculture courses.	3.68	.97	4.11	.89
High school agriculture is good preparation for college study in agriculture.	3.46	.85	4.13"	.97
High school agriculture should become less vocational.	3.05	.69	2.82	.96
High school agriculture should become more scientific.	3.39	.73	3.37	.91
Only students with farm backgrounds should pursue careers in agriculture.	1.43	.64	1.63"	.85
High school agriculture courses are better suited to male students.	2.46	1.08	2.20	1.14
College agriculture courses are better suited to male students.	1.96	.91	1.87	.81
High school study in agriculture is easier than in most other subjects.	3.00	.63	3.29	1.12
College study in agriculture is easier than in most other subjects.	2.29	.94	2.27	.96
High school agriculture courses are beneficial for higher-achieving students.	3.10	.60	3.51"	.91
High school agriculture courses are beneficial for lower-achieving students.	3.01	.68	3.44	.93
Most high school students should take some course work in agriculture.	3.35	.87	3.82"	.90

(table continues)

Statement	No High School Agriculture		High School Agriculture	
	M	SD	M	SD
Most college students should take some course work in agriculture.	3.26	.93	3.43	.99
Only students pursuing careers in agriculture should enroll in high school agriculture.	2.34	.84	2.00	.89
Only students pursuing careers in agriculture should enroll in college agriculture.	2.45	.91	2.30	.91

“Means were categorically different. Categories of agreement were: “Strongly Disagree” ( $\underline{M}$  = 1.00-1.49), “Disagree” ( $\underline{M}$  = 1.50-2.49), “Uncertain” ( $\underline{M}$  = 2.50-3.49), “Agree” ( $\underline{M}$  = 3.50-4.49), and “Strongly Agree” ( $\underline{M}$  = 4.50-5.00).”

College of Agriculture and pursue a career in the industry. This percentage increased slightly if students were also involved in FFA and remained constant for those involved in 4-H. The College of Agriculture should target high school agriculture programs in its recruitment program. By directing recruitment efforts toward this group of students, the College of Agriculture can make more efficient use of resources and increase retention rates.

Many secondary students in Iowa do not have the opportunity to enroll in high school agriculture programs. This study found that of those students not enrolling in high school agriculture, 68% did not have access to such a program. The second most cited reason was a conflict with college preparatory courses. The number of high school agriculture programs in the state should increase so that all students have access to agricultural experience, and classes should be offered at times that will minimize scheduling conflicts. An increase in the number of, and enrollment in, high school agriculture programs, should provide the College of Agriculture even greater enrollment and retention opportunities.

High school agriculture teachers continue to play an important role in assisting students in determining whether or not to pursue a college degree. Twenty percent of the respondents

indicated their agriculture teacher was the most influential source in making this decision. High school guidance counselors, siblings, and parents were respectively mentioned as the most influential person by 16.4%, 10.9% and 7.3% of the respondents. The College of Agriculture should recognize the importance of teachers of agriculture and continue to nurture these relationships. In addition, the College should keep these individuals informed of program changes and related information. By maintaining a positive relationship with teachers, counselors, parents, and siblings, the College can be more effective in its recruitment efforts.

The College of Agriculture should devote adequate resources to brochure development and distribution. Over 32% of the freshmen indicated that brochures were the most helpful source of information. Campus visits and letters from staff were respectively ranked by 24% and 20.7% of the respondents as the most effective source of information. Additionally, 6.7% of the respondents indicated that personal contacts from faculty were useful. The College should continue to provide quality recruitment brochures and encourage campus visits as part of its recruitment plan.

The College of Agriculture should explore the use of alternative retention activities (such as learning communities/teams, etc.) for incoming

freshmen. For those students who had decided to transfer out of the college/university, 10% indicated their reason as not feeling part of the program. While learning teams have only been in existence in the College of Agriculture for two years, anecdotal evidence indicates that these teams help ease the transition to college life by creating a "family" away from home. Further research to determine the usefulness of these teams is warranted. Likewise, a follow-up study should be conducted during respondents' senior years to determine if respondents have followed through on their stated intentions.

### References

American Association for Agricultural Education (1996, December). Reports of officers, organizational representatives and committees. Cincinnati, OH: Author.

Dyer, J. E., Lacey, R., & Osborne, E. W. (1996). Attitudes of University of Illinois College of Agriculture freshmen toward agriculture. Journal of Agricultural Education, *37*(3), 43-51.

Dyer, J. E., & Osborne, E. W. (1994, February). The influence of science-based agriculture courses on the attitudes of Illinois guidance counselors. Paper presented at the Central Region Agricultural Education Research Conference, St. Louis, MO.

Fishbein, M. & Ajzen, I. (1975). Beliefs, Attitudes, Intentions, and Behaviors. Reading, MA: Addison-Wesley Publishing Company.

Greenwald, A. G. (1989). Attitude structure and function. Hillsdale, NJ: Erlbaum Associates.

Illinois State Board of Education. (1993).

[Agriculture program enrollment statistics]. Unpublished raw data.

Iowa Department of Education (1997). (Iowa Agricultural Education Information). Unpublished raw data.

Litzenberg, K. K., Whatley, S. S., & Scamardo, J. (1992). 1991 U.S. enrollment for agriculture and renewable natural resources. NACTA Journal, *36*(2), 4-7.

Manderscheid, L. V. (1988). Undergraduate educational opportunities in the face of declining enrollments. American Journal of Agricultural Economics, *70*(5), 985-993.

National Research Council. (1988). Understanding agriculture: New directions for education. Washington, DC: National Academy Press.

Pins, K. (1997, June 1). U.S. population trend: Going rural. Des Moines Register, pp. 1A, 5A.

Russell, E. B. (1993). Attracting youth to agriculture: How colleges of agriculture can expand their role. Journal of Extension, *31*(Winter), 13-14.

Scofield, G. G. (1995, March). College of agriculture new student \_\_\_\_\_ Paper presented at the Central Region 49th Annual Research Conference in Agricultural Education, St. Louis, MO.

United States Department of Education, National Center for Education Statistics (1996). Digest of Education Statistics. Washington, DC.