

Employer Assessments of Graduates

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Colleges of agriculture have long been committed to quality education. Furthermore, the quality of an undergraduate degree program cannot be separated from the successes and failures of its graduates in the market-place (Pass). The task of producing marketable graduates requires an on-going sensitivity to the changing needs and perceptions of prospective employers. With unrepresented changes in student enrollments, backgrounds, skills and interests, there is a continual need for systematic and timely research on the needs and perceptions of employers who hire college of agriculture graduates.

In response to a felt need for more information on employer needs and perceptions, a survey of employers was undertaken at the University of Georgia. This paper reports major findings and implications of that survey. More specifically, the objectives of this paper are:

1. To describe general characteristics of employers by type of major recruited.
2. To describe employer preferences for and perceptions of skills held by new recruits.
3. To identify factors associated with starting salary differences in new recruits.
4. To offer recommendations for faculty counselling and curriculum development.

Previous studies in the area of careers in agriculture have been approached from the standpoint of 1) college of agriculture enrollments and alumni and 2) employers of graduates from colleges of agriculture.

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Studies of enrollments and alumni have focused on student characteristics, goals and perceptions (Denkelberger, et. al; Bachtel), on student enrollment trends (RICOP) and on alumni characteristics (Adrian, et. al; Broder and Deprey; Thatch; Nippo). Studies of employers have focused on supply and demand relationships (Coulter and Stanton; Brewer) and on employers' assessments of essential skills for new employees (Pass; Woods). This particular study adds to previous studies by providing additional documentation of employer needs and perceptions and by identifying factors which contribute to starting salary differences.

Survey and Data

In the spring of 1984, 855 pretested questionnaires were mailed to prospective employers and alumni. Of this number, 264 questionnaires were mailed to corporate offices of major agribusiness firms, 231 questionnaires were mailed to agricultural economics alumni who graduated from the University of Georgia from 1980-83. One hundred thirty-one (131) usable questionnaires were received from the survey for a response rate of 15 percent. When adjusted for non-delivered questionnaires, duplicate mailings and late replies a response rate of 17 percent was realized. The low response rate was partially attributed to 1) limitations in the corporate mailing list which identified only companies and not specific individuals in those companies and 2) multiple listings of employers in one or more of the mailing lists which, in effect, reduced the total number of employers surveyed. The adjusted rates from the corporate, council and alumni mailing lists were 14, 27, and 12 percent, respectively.

Table 1. General Characteristics of Employers by Type of Major Recruited, 1984.

	Agricultural Economics	Animal Sciences	Plant Sciences	Engineering	Social Sciences	General Agriculture	Non- Agriculture	All Majors
No. of Observations	35	13	22	16	9	22	72	131
No. of Employees								
Company	4619	784	4945	35,444	5236	19,387	15,027	10,451
Division	145	247	235	15,062	265	1947	4157	2767
% College graduates	57.7	49.2	55.6	33.8	58.4	55.6	46.6	44.4
No. of Employees								
Colleges of								
Agriculture ¹	75.9	26.4	93.6	20.4	57.7	53.9	35.9	38.1
University of Georgia ²	11.5	14.0	13.3	7.1	22.9	11.6	11.4	8.7
No. Hired During 1983	28.4	38.2	32.5	62.2	25.4	33.2	86.0	58.9
During typical year	31.6	29.5	35.3	136.3	25.5	40.1	108.5	73.8
Location of Company	percentage of business							
Business								
Georgia Only	35.7	32.2	34.2	26.4	70.8	46.4	68.6	47.7
All Southeast	56.0	73.0	52.8	47.9	88.3	61.5	76.4	64.4
All United States	87.1	92.0	87.3	80.6	93.3	87.6	88.2	88.4
Outside U.S. Only	12.9	8.0	12.5	19.4	6.6	12.5	11.8	11.6

¹ Includes Colleges of Agriculture from other universities.

² Includes total graduates from the University of Georgia and is not limited to graduates from the College of Agriculture.

Table 2. Salary and Benefits of Employers by Type of Major Recruited, 1984.

	Agricultural Economics	Animal Sciences	Plant Sciences	Engineering	Social Sciences	General Agriculture	Non- Agriculture	All Majors
Starting Salary (1984)	-----dollars-----							
Bachelors	17,741	17,303	17,779	19,836	15,944	17,876	17,152	17,218
Masters	19,839	18,933	19,443	23,618	17,357	20,464	20,438	20,267
Typical Salary Increase	-----percent-----							
Bachelors	13.0	8.3	11.4	9.2	7.0	9.2	9.9	10.3
Masters	10.1	9.5	8.2	10.3	7.2	7.8	9.6	9.2
Benefits Available								
Health Insurance	97.1	100.0	100.0	100.0	100.0	95.2	97.2	97.5
Life Insurance	97.1	100.0	100.0	93.8	100.0	95.2	93.0	92.4
Travel Allowance	77.1	84.6	63.6	81.3	88.9	90.4	71.8	74.0
Company Auto Expense Account	51.4	53.8	63.6	37.5	66.7	57.1	46.5	47.1
Pension Plan	65.7	69.2	59.0	81.3	77.8	66.7	63.4	62.1
Profit Sharing	57.1	53.8	72.7	68.8	66.7	71.4	67.6	65.6
Other	34.2	46.2	36.3	62.5	11.1	47.6	53.5	44.5
	20.0	23.1	22.7	25.0	11.1	33.3	22.5	20.2

General Characteristics

General characteristics of employers responding to the survey are found in Table 1. To permit meaningful comparisons, the employers were classified by type(s) of major, which had been recruited. Majors identified in the survey were: agricultural economics (agribusiness), animal sciences, plant and soil sciences, agricultural engineering, agricultural social sciences (other than economics), general agriculture and non-agriculture. Because some firms recruit majors from more than one category, the sum of individual majors exceeds the total number of employers responding.

The largest companies, by number of employees, were the engineering firms with an average of 35,444 employees. Firms recruiting animal science majors tended to be the smallest with an average of 784 employees. Companies hiring social science majors reported the largest percentage of college graduates in their workforce while engineering firms reported the least. In general, hirings during 1983 were down from hirings reported for typical years.

The number of employees from colleges of agriculture ranged from 93.6 among plant and soil science firms to 20.4 among engineering firms. When compared to the number of division employees these data give an estimate of the percentage of employees from colleges of agriculture. These data also indicate that these firms recruited from several colleges of agriculture in addition to the University of Georgia's.

Table 1 also shows the percentages of company business located in Georgia, the southeastern United States, the United States and outside the United States. These data indicate that 48 percent of the business activities of these companies was located in Georgia. When the non-agricultural related firms are removed for the aggregate, that percentage tends to decline. In addition, an average of 64 percent of the company's business was located in the Southeast with almost 12 percent being located outside of the United States. These data suggest 1) that companies surveyed were

regional, national and international in scope and 2) that the findings of this study have implications for colleges of agriculture graduates in other states.

Salary and Benefits

A summary of salary and benefits are reported in Table 2. Mean starting salaries for bachelors graduates hired in 1984 ranged from \$15,944 for social science graduates to \$23,618 for engineering graduates. Similar contracts were found among masters degree graduates. The largest expected salary increases among bachelors recruits were reported by firms who hire agricultural economics/business graduates. These increases were attributed to the predominance of sales related jobs among these firms. Again, the smallest expected salary increases were found among agricultural social science majors.

Employers were also asked to report other benefits offered by their companies. Health insurance was offered by over 97 percent of firms surveyed, with life insurance being offered by 92 percent, travel allowances by 74 percent, pension plans by 66 percent, expense accounts by 62 percent, company autos by 47 percent, and profit sharing by 45 percent. While these benefits were thought to increase the employees' effective salary, no attempt was made to calculate an actual dollar value for these benefits.

Employer Preferences

Employers were asked to indicate the relative importance of various traits associated with a new recruit. In addition, employers were asked to identify skills found lacking in new recruits. Employers were given a list of six traits from which to rank in order of their importance to the company. Rankings were based on a scale of one to seven, where one was most important and seven was least important.

Results from this question were surprising but generally consistent with other studies (Pass). When all majors were considered, employers placed the most importance on communication skills, followed by leadership experience and work experience. Grade

Table 3. Employer Preferences for Student Characteristics by Type of Major Recruited, 1984.

	Agricultural Economics	Animal Sciences	Plant Sciences	Engineering	Social Sciences	General Agriculture	Non- Agriculture	All Majors
Importance of	----- mean ranking ^a -----							
Traits to Company	-----							
Grade Point Average	3.8	3.6	3.4	3.3	3.0	3.9	3.6	3.7
Leadership Experience	3.0	2.5	2.7	2.5	2.0	2.5	2.6	2.6
Communication Skills	1.7	1.7	1.8	2.2	1.9	2.2	2.0	2.0
References	4.8	5.3	5.1	5.1	5.6	5.2	4.8	4.9
Farm Background	3.7	3.4	3.4	4.3	3.5	3.6	4.4	3.9
Work Experience	3.3	2.4	3.1	3.1	2.8	3.3	3.0	3.0
Other	5.0	4.0	4.5	4.7	5.7	4.3	4.7	4.8
Skills Found Most	----- percentage of companies -----							
Lacking by Company	-----							
Business	26.9	16.7	20.0	8.3	0.0	13.3	12.3	14.8
Computer Skills	3.8	0.0	6.7	8.3	0.0	0.0	3.5	2.3
Communication Skills	38.5	41.7	26.7	41.7	85.7	60.0	47.4	43.2
Management Skills	3.8	8.3	13.3	8.3	14.3	6.7	5.3	5.7
Personality Traits	3.8	8.3	0.0	8.3	0.0	0.0	8.8	6.8
Rural Background	3.8	8.3	6.7	0.0	0.0	0.0	1.7	2.3
Work Experience	19.2	16.7	26.7	25.0	0.0	20.0	21.1	21.6

^a Based on a scale of 1 to 7 where 1 = most important and 7 = least important.

point average ranked fourth, followed by farm background and letters of reference. Surprisingly, the traits which involve faculty most directly received the least priority by employers. This may not suggest that grade point average and letters of reference are not important. Instead, these particular traits may not be viewed as sufficient by employers.

When asked to identify skills found most lacking in new recruits, 43 percent of the employers reported communication skills. An absence of work experience among new recruits was reported by 22 percent of employers, followed by business skills with 15 percent. Surprisingly, only 2.3 percent of the employers mentioned computer skills as lacking among new recruits. This suggests that colleges of agriculture are either doing an excellent job in computer training or that computer skills may not be given high priority for non-computer specialists. A distinction can be made between computer skills in programming and knowledge of computers or the ability to communicate with computers and computer specialists. While programming skills may be required for a few specialists, knowledge of computers may be more essential for the typical recruit.

Business Activities

In this period of business diversification, firms are often engaged in a variety of business activities. Hence, classifying companies by type of business activity is difficult. A particular company may be engaged in two or more related or unrelated activities. Instead of classifying firms by type of activity, this paper reports the percentages of companies engaged in various activities and the percentage of company business located in various geographic areas.

Of the companies responding to the survey approximately 69 percent were engaged in business activities related to agriculture. When all respondents were considered, approximately 23 percent were involved with agricultural chemicals, 43 percent with

finance, 36 percent with management, 18 percent with mechanics, 16 percent with food processing, 23 percent with grain merchandising, 23 percent with retail sales, 22 percent with production and 33 percent with other activities with were dominated by agricultural and human service activities.

Salary Model

Relationships between starting salaries and various company characteristics were explored in the context of a general salary model. The purpose of this model was to identify and measure the influence of selected company characteristics on starting salaries paid to bachelors degree graduates. The starting salaries paid by companies was conceived to be associated with the following explanatory variables:

COEMP was entered as a measure of company size. Production and marketing cost advantages were assumed to increase with company size and such advantages would enable firms to be more competitive in the labor market. A positive relationship was expected between company size and starting salaries.

SALES was entered as the percentage of new employees engaged in sales. Sales related companies have the potential for offering their employees greater performance incentives. Such incentives plans could lead to greater worker productivity. Hence a positive relationship was expected.

WORLD was entered as the percentage of company's international business activities. Participation and influence in international markets was thought to have a positive effect on starting salaries. Higher salaries may also be needed to compensate employees for assignments outside of the United States.

AGCHM was entered as a measure of the company's involvement with the farm input sector. Starting salaries of farm supply companies were thought to be depressed due to the government's PIK program. Hence a negative influence was expected.

Table 4. General Business Activities of Employers by Majors Recruited, 1984.

Business Activities of Company:	Agricultural	Animal	Plant		Social	General	Non-	All
	Economics	Sciences	Sciences	Engineering	Sciences	Agriculture	Agriculture	Majors
	percentage of companies							
Related to Agriculture	82.6	91.9	88.3	54.5	89.3	59.1	71.7	69.1
Agr. Chemicals	25.0	25.0	42.9	12.5	50.0	14.5	40.0	23.3
Finance	40.6	41.7	19.0	18.8	25.0	47.8	45.0	42.5
Management	43.8	41.7	19.0	25.0	50.0	46.4	30.0	35.8
Agr. Mechanical	18.8	0.0	9.5	25.0	25.0	13.0	25.0	17.5
Food Processing	9.4	25.0	4.8	18.8	37.5	14.5	10.0	15.8
Grain Merchandizing	28.1	41.7	14.3	18.8	37.5	23.2	30.0	22.5
Retail Sales	25.0	33.3	14.3	18.8	37.5	18.9	30.0	22.5
Agr. Production	21.9	8.3	28.6	18.8	50.0	13.0	20.0	20.8
Other	34.4	33.3	47.6	43.8	37.5	36.2	35.0	32.5

AGPRO was included to allow for the low rates of monetary return in production agriculture. Given their lack of market power and the depressed market prices of the survey period, a negative relationship was expected.

AGENG was entered as a measure of the company's engineering related activities. Engineering students are generally required to make larger human capital investments in earning their salaries in the market-place.

AGSOC was entered as a measure of the company's involvement with non-technical related activities. Graduates with social science degrees are

Table 5. Factors Associated With Starting Salary Differences Among Employers of Graduates from Colleges of Agriculture, 1984

Name	Description	Mean	Estimated Coefficient
Dependent			
SALBS	Starting salary of graduates with bachelors degrees	\$17,218	—
Explanatory			
1. INTERCEPT			18,301.68
2. COEMP	Total Number of company employees in thousands	10.45	28.82 (18.16)
3. SALES	Percentage of new employees engaged in sales	29.80	37.39*** (13.00)
4. WORLD	Percentage of company business located outside of United States	11.56	94.16*** (24.41)
5. AGCHM	Binary = 1 if company engaged in ag chemicals; = 0 if otherwise	0.23	-2525.14* (1502.69)
6. AGPRO	Binary = 1 if company engaged in ag production; = 0 if otherwise	0.21	-4008.56*** (1296.31)
7. AGENG	Binary = 1 if company recruits engineering graduates = 0 if otherwise	12.21	3586.53*** (1162.11)
8. AGSOC	Binary = 1 if company recruits ag social science graduates; = 0 if otherwise	6.87	-1960.26 (1503.51)
9. BSPER	Percentage increase in salary after one year	10.28	-271.52***

R² = 0.57; Number of observations = 52

■ standard errors shown in parentheses

* significant at the alpha = .10 level

*** significant at the alpha = .01 level

generally recruited into service/educational organizations which generally have fewer resources to compete in the labor market. Hence a negative association was expected.

BSPER was entered as the percentage increase in the recruit's salary after one year. Given a high degree of competition across companies and the ability of employees to change jobs early in their careers a certain degree of parity was thought to exist in labor markets. Starting salaries were thought to vary inversely with anticipated salary increases.

Results

Multiple regression techniques were used to estimate the influence of the explanatory variables on starting salaries (Kmenta). Model estimates, shown in Table 5, suggest that the influence of each of these variables was as expected. Company size, involvement in sales and engineering activities and, participation in international markets were found to have a positive influence on starting salaries. Participation in agricultural chemicals, agricultural production and social science related activities were characteristic of companies with lower starting salaries. Likewise, companies which offered larger pay increases after the first year of service, tended to offer lower starting salaries. Such company behavior may be characteristic of companies who train their recruits during their first year of employment.

Approximately 57 percent of the variation in starting salaries was explained by the variables included in the model. Six of the eight explanatory variables were found to be statistically significant at conventional levels. Company size and involvement with social science activities were not statistically significant.

Implications

This paper has attempted to provide more systematic information on labor market conditions for college of agriculture graduates. Implications of this study include:

1. Colleges of agriculture need to critically assess the level of communication skills requirements in their degree programs.

2. Colleges of agriculture should provide greater opportunity for leadership and internship experience in their degree programs.

3. Colleges of agriculture should continue to offer and promote the unique marketable characteristics of their degree programs.

4. Colleges of agriculture need to be sensitive to changing labor market conditions for their graduates.

In this period of declining enrollments, colleges of agriculture must critically assess their performance in marketing both their degree programs and their graduates (Dehne; Topor). The task of recruiting students and advising them on career related choices requires a clear understanding of the labor market for college of agriculture graduates. Without reliable information on labor market supply and demand conditions, colleges of agriculture may soon join the ranks of other colleges who recruit and educate students who cannot find jobs in their chosen fields.

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