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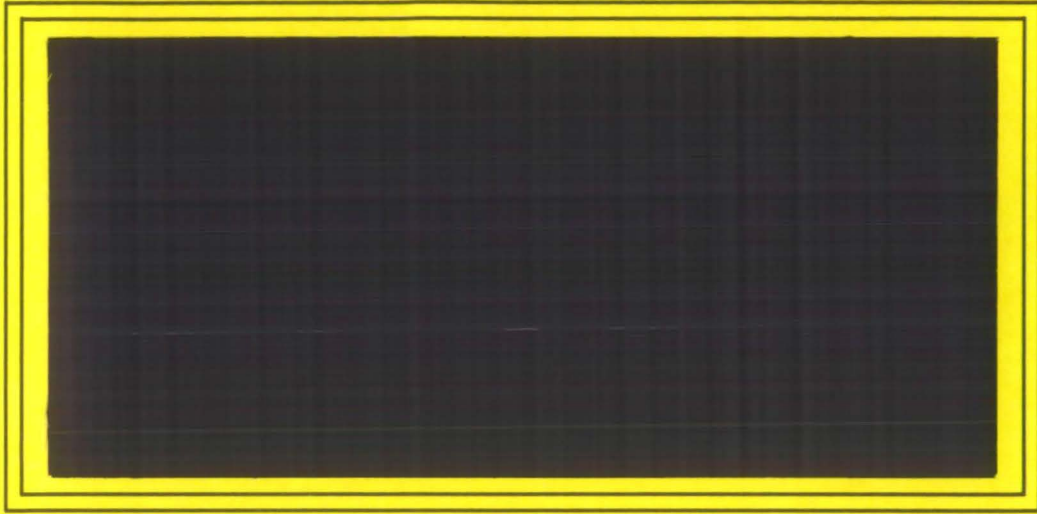
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**Department of Agricultural Economics
 and Rural Sociology**

College of Agriculture
 University of Idaho
 Moscow, Idaho 83843

**IDAHO EMPLOYMENT TRENDS AND PROJECTIONS FOR
COLLEGE GRADUATES WITH SPECIALIZATIONS IN
AGRICULTURE BUSINESS AND MANAGEMENT**

By

Stephen Cooke

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Stephen Cooke is an Assistant Professor in the department of Agricultural Economics and Rural Sociology at the University of Idaho.

**Idaho Employment Trends and Projections for College
Graduates With Specializations in Agriculture Business and
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**The Problem: Maintaining Human Capital Investment in the
Food & Agriculture Sector**

Solow has demonstrated that sustained growth in the output of an economy requires that capital investment keep pace with growth in population and productivity (pp. 37-38). As teaching faculty of agricultural economics and rural sociology, we help maintain an appropriate level of human capital investment for the agricultural and rural sector of Idaho and, to a lesser extent, the Pacific Northwest, the Nation and the World.¹ We are developing business and management problem-solving skills in the future labor pool of the food and agriculture sector. This is the essence of our teaching mission as I see it.

We do not manufacture "goods" but, rather, we provide a service. This distinction has two important implications. First, we do not buy our raw product (the students). They buy our services. Therefore, we are dependent on the students' demand for our services. That demand is soft and getting softer. The American College Testing (ACT) Program disclosed two trends tracked between 1976 to 1988 that are cause for concern: "[1] fewer students are selecting agriculture majors and careers, and [2] the academic ability of such students, as measured by test scores and high school

¹ Mosman reports that 53% of U of I, College of Agriculture alumni work in Idaho, 14% in Washington, 11% in California, Montana, and Oregon, 22% other (p. 31).

grade average, is declining" (p. 11). ACT also found that 38% of high school students who indicated an agriculture major as their first choice in college had changed their mind one year later (p. 18). None of those who declared non-agriculture majors were reported to have switched to agriculture over the same interval. Finally, ACT discovered that 74% of students surveyed "disagreed with, or were not aware of the contention that graduates with agriculture-related majors often pursue business careers" (ACT, Appendix A, Section III, Q1I). Nor are we doing a particularly good job of educating about career opportunities in the food and agriculture sector even for our majors. Mosman reports that "nearly two-thirds [of the U of I College of Agriculture alumni] rated career counseling as only fair to average while 11 percent rated it poor" (p. 72).

The second implication is that we do not sell our output, rather the output sells itself. However, it is in our interest to make sure that the employer and employee interests are being well served. We need to keep in touch with changing tastes and preferences of the employers. The literature suggests that agribusiness employers are less than enthusiastic about graduates from colleges of agriculture, nationwide. For example, a study by the University of Nevada, Reno found that "only about 25% of the new employees hired by agribusiness and food industry come from ag schools" (Tevis, p. 17). Reasons cited for not hiring more agriculture graduates include the need for more

1) economics, 2) business market analysis, 3) sales and advertising, 4) computer science, 5) business management, 6) lack of insight into role of the food sector in the world, 7) inability to communicate effectively verbally or in writing, and 8) lack of knowledge in world history, geography, psychology, and the liberal arts (Tevis, p. 17).² There is a real possibility that these two problems are interrelated. Students are becoming aware that agriculture graduates are not competitive with other graduates in the agribusiness job market. Consequently, they are bypassing our services. Thus, the student demand for our services is indirectly related to the market demand for students with the skills we provide them. Russ Withers will be discussing these problems in detail.

We are not a monopoly. We are in friendly competition with a number of other departments in the college, on campus, and at other institutions of higher education in the state and region. As with any other business, we would be well advised to know the demand for our services, find our market niche, maintain our market share, establish our

² The College of Agriculture at the U of Nevada (Reno) has conducted a national study of more than 100 agriculture, agribusiness, and food industry employers and company executives. The report resulting from this survey "Searching for the Ideal Agricultural Graduate" and the accompanying video tape is available for \$300.

service quality, build our identity among our targeted student population(s), strive for increased productivity, and keep a close eye on the competition.

Schuh states:

The courses we teach and the various curricula we offer are important means by which we compete in the emerging market we face. What we do in designing courses, in designing curricula, and in offering our educational services to that market will largely determine our fate in the years ahead. We are fundamentally an education institution. Even though we sometimes act as if we just wish students would go away and not bother us, the truth of the matter is that whether our programs grow and develop, whether our salaries rise, and whether we have the quality students ... we would all like to have[,] will be determined fundamentally by what we teach, how we teach it, how we attract students into our program, and how we care for those students once they are in our programs. (pp. 2-3)

Larry Makus will give us a survey of how other departments of agricultural economics have chosen to address the course and curriculum problems facing the discipline.

The objective of this paper is to provide an analysis of the supply/demand relationship for graduates of agricultural economics and rural sociology at the University of Idaho. The approach is to scale numbers from two national studies done in 1980 and 1986 to the state using population proportions. The results are then compared to a survey of occupation by U of I College of Agriculture graduates conducted by Mosman in 1987. The purpose is to identify potential market niches that our department could fill and maintain. If a particular demand for human capital could be met by our department's graduates, then it should suggest the type of training needed, which in turn can be reflected

in our curriculum and courses. (Presumably this is why Jerry Marousek wanted me to discuss this topic this morning).

The Market for Graduates with Higher Education Degrees in Agriculture Business and Management in Idaho

The 1977 Farm Bill (PL 95-113) contained a section (1405) that states, in part, that the USDA shall:

keep informed of developments in, and the Nation's need for, research, extension, teaching, and manpower development in the food and agricultural sciences and represent such need in deliberations within ... land-grant colleges and universities (USDA, p. 1)

In carrying out this mandate from Congress, the USDA, Science and Education Administration, Office of Higher Education conducted

a comprehensive analysis of the occupational structure of the food and agriculture sector of the Nation's economy and the extent to which higher education is producing the specific types of graduates required by the total spectrum of food and agricultural industries. The basic focus of the project was to identify current and projected employment opportunities for graduates of higher education programs in the food and agricultural sciences. (USDA, p. 1)

The data for the USDA study came primarily from two sources, one for supply and another for demand. The Higher Education General Information Surveys (HEGIS) from the DHEW, National Center for Educational Statistics were used to provide information on the supply of graduates with degrees in agriculture-related fields. They used the Occupational Employment Statistics (OES) from the USDC, Bureau of Labor Statistics to determine the demand for employees in the food and agriculture sector.

Then a panel of experts were asked

to identify the degree of specialization that results in expertise in the food and agriculture sciences ... For each of the degree specializations, the panel estimated also the percentage of graduates at each degree level ... qualified for employment related to food/agriculture. (USDA, p. 7)

From the HEGIS data, USDA derived a higher education degree-occupation matrix of the supply of human capital for the food and agriculture sector available annually for the U.S. Out of this process, 11 educational clusters were defined from the original 122 degree specializations (p. 8). For our purposes in agricultural economics and rural sociology, we are concerned primarily with the "Agricultural Business and Management" educational cluster. Appendix I provides a list of higher education degree specializations within the agriculture business and management cluster.

From the Occupation Employment Statistics, USDA then developed an industry-occupation matrix of the current and projected demand for human capital in the food and agriculture sector for the U.S., including military and foreign service requirements. The projected demand, measured in terms of average number of annual openings, was based on estimates of employment growth and replacements. From this process 83 occupational categories were aggregated into 8 occupational clusters (USDA, p. 15). Only four occupational clusters are of primary importance to graduates of agricultural economics and rural sociology. These are 1) sales and marketing representatives and purchasing agents, 2) administrators, managers, and financial advisors, 3) agricultural production and management specialists and 4)

scientific and professional specialists. Appendix II provides a detailed listing of the occupational categories within each of these four occupational clusters.

The results of the USDA projections to 1985 of annual supply of and demand for graduates of higher education for the food and agriculture sector by occupational cluster are presented in table 1. The national numbers were scaled to the state of Idaho by dividing by 250, which is approximately the proportion of Idaho's population to the nation. This procedure implies that the demand and supply for these occupations in nation is proportionately the same in Idaho. The food and agriculture sector is a larger percentage of the Idaho's economy than it is for the nation as a whole. Thus, Idaho's proportion of the national projections may, if anything, understate Idaho's employment demand.

These numbers suggest that, up to 1985, the state of Idaho had a sufficient supply of scientific and professional specialists and agricultural production and management specialists to meet the demand. There was a shortage of administrators, managers, and financial advisors (8 people per year) and sales and marketing representatives and purchasing agents (7 people per year).

The USDA numbers were updated in 1986, with projections to 1990 (Coulter and Stanton). See table 2. Again, Idaho had a sufficient supply of scientific and professional specialists and agricultural production and management

specialists. And again, there was a shortage of administrators, managers, and financial advisors (5 people per year) and sales and marketing representatives and purchasing agents (10 people per year).

Tables 1 and 2 are suggestive of the supply and demand for college graduates in the agriculture sector in the U.S. and Idaho. But these "top down" estimates are suspect in the absence of local or "bottom up" estimates for at least some of these categories. Fortunately, Mosman reports the occupations held in 1987 for 801 graduates from the University of Idaho, College of Agriculture, who received bachelor's degrees between 1973 and 1985 (p. 29). Mosman's job categories were assigned to the USDA occupational clusters. The results are reported in table 3. The job classifications of the 801 respondents to the Mosman survey were used to assign the entire population of 1022 U of I, College of Agriculture graduates to an occupational cluster. It was assumed that the non-respondents were distributed proportionately across occupational clusters established by the respondents. These numbers then represent the 13 year total of graduates from the College of Agriculture by occupational cluster. Dividing these numbers by 13 provides the average annual supply of College of Agriculture graduates by occupational cluster. These 1973-85 "bottom up" supply numbers are compared to the 1985 and 1990 "top down" projected demand for Idaho graduates in the food and agriculture sector in terms of market share.

Since it is unlikely that all available positions in the food and agriculture sector in Idaho are being filled by U of I, College of Agriculture graduates, we might expect the market shares to be less than 100%. Also, we are ignoring the fact that only about 55% of U of I, College of Agriculture graduate take positions in Idaho (Mosman, p. 31). Thus, we are making optimistic estimates of supply and pessimistic estimates of demand. The College is doing better in meeting its obligation of training agriculture specialists in some employment clusters than in others. For example, we are supplying about 70 to 115% of the demand for the agriculture production and management positions, and over 70% of the demand for scientific and professional specialists. On the other hand, we are providing only 20 to 50% of the demand in the sales marketing, and purchasing; and in the administrators, managers and financial advisors categories. The Department and the College may need to consider its relative emphasis on production and management as the demand for graduates with these skills declines.

The number of scientific and professional specialists supplied by the College of Agriculture (12 per year) is probably about enough. This category is particularly difficult to analyze because the USDA numbers (as presented here) are likely to be low in some respects and high in others: low because they include only specialists who would mainly benefit from a social science degree in their occupation, and high because they include foresters, a

category not represented in the Mosman numbers. Mosman's count of College of Agriculture graduates is also likely to be somewhat inaccurate for our purposes: high because it includes the physical and biological science professionals, but also low because it does not include graduates from the School of Home Economics, thus leaving out dieticians and others trained for employment in the food system.

The numbers on the demand and supply of administrators, managers, and financial advisors suggests one potential area for expanding our educational services. The demand for this category projected by the USDA for 1985 and 1990 (25-28 per year) is more than twice as large as the supply reported by Mosman's study (12 per year) met by the College of Agriculture. Thus, there appears to be room for expansion in this occupational category by about 5-6 graduates per year. This is probably the area of greatest potential for expansion for the Department of Agricultural Economics and Rural Sociology. Our department probably has a comparative advantage in this area within the state of Idaho.

The sales and service representatives and purchasing agents occupational cluster shows the greatest discrepancy between the demand (61-63 per year) and the supply (13 per year). I would argue that we may not have a comparative advantage in this area however. Do sales and marketing representatives and purchasing agents need the level of analytical skills that the other occupational clusters mentioned above require? If the answer is no, then other

departments or on-the-job-training may be more competitive in this area. Training students in the area may not make the best use of our resources. This is point well worth debating, however, given the potential size of the demand for this category.

Conclusions

The College and the Department appear to be making a substantial contribution toward providing food and agriculture business and management specialists to the state of Idaho. About 2 out of 5 business and management specialists in Idaho are (or could be) graduates from the College of Agriculture. About 3 out of 4 agriculture production and management, and scientific and professional specialists are College of Agriculture graduates. However fewer than half of the administrators, managers and financial advisors along with sales and service representatives and purchasing agents in the food and agriculture sector are College of Agriculture graduates. It is in training for these latter areas that unexploited opportunities to attract additional students into our programs appear to exist.

It might be helpful to contact some of our alumni, currently employed in the agriculture and food sector, and ask them to comment on the strengths and weaknesses of their academic preparation. Alumni responsible for recruitment of personnel, could be particularly useful in telling us what

they look for in the educational background of the people they hire.

The Department might consider including additional career services as part of its advising responsibilities. Such things as career counseling, advising and job placement might add significantly to the attractiveness of our bachelor's degree program. Our department was consistently singled out in Mosman's study, along with some other departments, for significantly low ratings in the areas of career counseling, advising, and placement (pp. 75-76). "In comparing the rating of undergraduate faculty advising characteristics by major, Agriculture Mechanization graduates seemed to be the most positive Agricultural Economics [graduates] were the least positive in their ratings of the undergraduate advising characteristics of the College of Agriculture faculty" (p. 76).

The challenge is to provide a quality education that "trains and develops students' minds rather than training them for a specific job" (Schuh, p. 14). We must try to avoid training that will become obsolete, but is not too abstract. We need to balance the depth of economic theory with the breadth of a liberal arts education. We need to find a balance between mathematics, statistics, and computers on the one hand, and history, rhetoric, and psychology on the other. We need to broaden our applied education mission to the food industry without abandoning our commitment to agriculture.

Table 1. Annual Supply/Demand for Graduates of Higher Education by Occupational Cluster in the
Agricultural Sector of the U.S. and Idaho: 1985

Occupational Cluster	U. S.			Idaho	
	Demand	Supply	%	Demand	Supply
Sales & Marketing Reps	15319	13434	88	61	54
Admin, Managers, Advisor	6184	4293	70	25	17
Ag Production & Mgt	6245	6238	99	25	25
Sc & Prof Specialists	4301	3957	92	17	16
Total	32049	27922	87	128	112

Source: USDA, Science and Education Administration, 1980.

Table 2. Annual Supply/Demand for Graduates of Higher Education by Occupational Cluster in the Agricultural Sector of the U.S. and Idaho: 1990

Occupational Cluster	U. S.			Idaho	
	Demand	Supply	%	Demand	Supply
Sales & Marketing Reps	15806	13174	83	63	53
Admin, Managers, Advisor	6938	5805	84	28	23
Ag Production & Mgt	3775	4272	113	15	17
Sc & Prof Specialists	3995	4139	104	16	17
Total	30514	27390	90	122	110

Source: Coulter and Stanton, 1986.

Table 3. Occupations taken by 1973 to 1985 Graduates from the University of Idaho with Bachelors' Degree from the College of Agriculture (75% Agriculturally-related) and Projected 1985 & 1990 Demand.

Occupational Cluster	Sample	%	Total	Supply		Demand		1985	1990
				Idaho	1973-85	1985	1990	Mkt Share	Mkt Share
				Yrly Ave	Projected	Projected	%	%	
Sales & Marketing Rep ¹	131	16	164	13	61	63	21	21	
Admin, Managers, Advisor ²	121	15	153	12	25	28	48	43	
Ag Production & Mgt ³	175	22	225	17	25	15	68	113	
Sc & Prof Specialists	115	15	153	12	17	16	71	75	
Other ⁴	259	32	327	na	na	na	na	na	
Total/Average	801	100	1022	54	128	122	42	44	

1 Includes Agribusiness Personnel defined as sales and marketing, and public relations

2. Includes Business Owners/Managers, and Financial Personnel.

3 Includes Production (farmers and ranchers) and Production Managers (ranch foremen, orchard supervisors, herdsman).

4 Includes Veterinarians and Vocational Agriculture Instructors, Production Personnel (farm laborers and ranch hands), Miscellaneous.

Source: Mosman, 1987.

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Appendix I

Higher Education Degree Specialization: Agriculture Business and Management Cluster

Agricultural Degrees

1. Ag and Farm Management
2. Ag Economics
3. Ag Business
4. Hotel and Restaurant management
5. Institutional and Cafeteria management

Agriculture-Related Degrees

1. General Business and Commerce
2. Accounting
3. Business Statistics
4. Banking & Finance
5. Investment & Securities
6. Business Mgt & Admin
7. Operations research
8. Marketing & Purchasing
9. Transport & Public Utilities
10. Real Estate
11. Insurance
12. International business
13. Personnel Mgt
14. Labor & Industrial Relations
15. Business Economics
16. Biometrics & Biostatistics
17. Computer & Information Sc.
18. Data Processing
19. Systems Analysis
20. Statistics
21. Economics
22. Business & Commerce Technologies
23. Mktg, dist, purchasing, business, indust. mgt tech.
24. Sanitation and Public Health tech.

Source: USDA, Science and Education Administration

Appendix II

Occupations Apportioned Among Occupational Clusters

1. Sales and Marketing Reps and Purchasing Agents
 1. Buyers and Shippers of farm produce
 2. Wholesale and retail buyers
 3. Demonstrators
 4. Insurance agents, brokers, underwriters
 5. Managers & administrators nec
 6. Purchasing agents and buyers
 7. Real estate agents
 8. Restaurant, cafe, and bar managers,
 9. Sales managers & dept heads
 10. Sales workers & sales clerks
2. Administrators, Managers, and Financial Advisors
 1. Accountants
 2. Assessor, controller, and treasurers
 3. Local public official & administrators
 4. Bank officers and financial managers
 5. Blue-collar worker supervisors
 6. Credit and collection managers
 7. Economists
 8. Estimators and investigators, nec
 9. Insurance adj, examiners, and investigators
 10. Personnel and labor relations workers
 11. Real estate appraisers
 12. Stock & bond sales agents
3. Agricultural Production and Management Specialist
 1. Farmer, proprietor or tenant
 2. Farm labor supervisor
 3. Farm management advisor
 4. Farm manager
 5. Farm services contractor
4. Scientific & Professional Specialists (partial list)
 1. Foresters & resource conservationists
 2. Inspector, grader, scaler, administration
 3. Rural sociologist
 4. social worker
 5. Urban & Regional planner

Source: USDA, Science and Education Administration.