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Comparing Agricultural Economics Graduate Programs: What Are Prospective Students Options?

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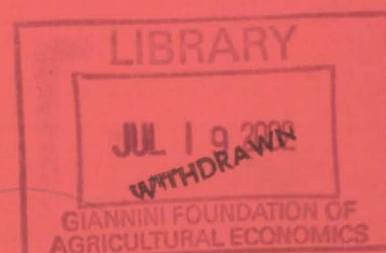
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Abstract

Over 1,800 agricultural economics graduate students at 41 Ph.D. and master's degree granting institutions in the United States were surveyed to determine their demographic characteristics, academic motivations, financial assistance, scholastic output, and professional activities. Responses were received from 306 Ph.D. degree-seeking students and 244 students pursuing masters degrees. They indicated career advancement potential was their most important reason for pursuing a graduate degree. Students choose among graduate programs largely based on departmental reputation and financial assistance. Scholastic output and professional activities differ between top ranked and lower ranked graduate programs, with graduate students at top ranked schools focusing on teaching activities whereas students in lower ranked graduate programs emphasized research and extension output.

Introduction

The decision to pursue a graduate degree in agricultural economics can be a difficult one for many students. Deciding *which* graduate program to enroll in can be even more formidable. Prospective students must evaluate a myriad of alternatives including size and composition of the graduate program, department, and university; specialty options; location; and financial assistance. In recruiting these students, faculty and program administrators must promote the strengths and uniqueness of the graduate program relative to other competing programs. To do so effectively, however, requires an understanding of not only prospective students' needs, but also other graduate programs. We present information to aid both students in evaluating various agricultural economics graduate programs and faculty in recruiting for their graduate program.

Although most agricultural economics graduate programs offer brochures, fact

sheets, and other information about their program and degree options, limited information is available to assist prospective students in comparing and contrasting the alternatives. Perry recently reported faculty's qualitative rankings of agricultural economics graduate programs. We offer additional information regarding the student composition of graduate programs, students' work responsibilities and activities, and benefits and monetary stipends received for both top ranked and lower ranked Ph.D. and masters' degree-granting agricultural economics programs in the United States. Graduate students may use this information to compare graduate program attributes and evaluate prospective financial assistance offers.

Graduate program administrators may use information regarding students' demographic characteristics, responsibilities, output, and funding to assess their program's competitive position relative to other agricultural economics programs and develop effective recruiting strategies. For

example, given knowledge that their program is relatively uncompetitive in awarding financial stipends, a graduate program administrator may choose to increase non-pecuniary benefits in order to increase the program's desirability to students. Further, knowing the amount of monetary stipends and benefits typically awarded to graduate students for particular work requirements may assist program administrators in setting stipend levels for their own graduate students.

Choosing a Graduate School

The school choice decision at the undergraduate level has received considerable attention in the literature (e.g., Parker, Pettijohn and Pettijohn; Kealy and Rockel; Kellaris and Kellaris; and Smith). Smith determined that type and size of the school most influenced undergraduate students' school choice. College facilities, location, and professors' degrees were identified as important determinants of school choice by Parker, Pettijohn, and Pettijohn. Other research has addressed the school choice decision at the graduate level. Olson found that school reputation, cost and location are important to graduate students. The highest quality potential graduate students place more emphasis on departmental reputation and financial assistance (Malaney). Other factors like school accreditation, personal contact with faculty, and degree marketability are also considered important in the graduate school choice decision (Olson; Webb).

Although a broad range of school choice determinants has been identified across a variety of study areas, determinants of school choice within a specific college or major area of study has received less attention. Mark, Daniel, and Lusk found

that agricultural economics graduate students place the greatest value on school ranking, followed by financial assistance, departmental resources, and distance from the student's home. In contrast to their study that focused on student valuation of a limited set of school choice determinants, this study examines student rankings over a broader range of qualitative factors and school choice determinants. In addition, this study identifies reasons students choose to pursue a graduate education in agricultural economics (regardless of which school). This information can help faculty identify potential agricultural economics graduate students and promote the specific attributes of their graduate program that students consider most in the school choice process.

Survey Design

Students enrolled in 41 U.S. colleges and universities granting Ph.D. and masters degrees in agricultural, resource, environmental, and/or general (with emphasis in agricultural or resource) economics (table 1) were surveyed to gather information regarding their demographic characteristics, decision criteria involved in choosing their graduate program, work responsibilities and activities in graduate school, and financial assistance including benefits and perquisites. The survey was administered electronically via the Internet to 1,479 students at 36 of the 41 institutions and by traditional print format to 350 students at the remaining 5 schools.

To administer the Internet survey, graduate students were contacted by E-mail to solicit their participation. The E-mail explained the purpose of the survey and directed students to a website where they submitted their responses online. To prevent unauthorized access of the survey and

Table 1. Ph.D. and Masters Graduate Programs, By Rank^a

<i>Top 10 Ph.D. Programs^b</i>		
U of California-Berkeley	U of California-Davis	Cornell U
Iowa State U	U of Maryland	U of Minnesota
North Carolina State U	Purdue U	Texas A&M U
U of Wisconsin		
<i>Other Ph.D. Programs^b</i>		
U of Arizona	Auburn U	Clemson U
Colorado State U	U of Connecticut	U of Florida
U of Illinois	Kansas State U	U of Kentucky
Louisiana State U	U of Massachusetts	Michigan State U
Mississippi State U	U of Missouri	U of Nebraska
U of New Hampshire	Oklahoma State U	Oregon State U
Pennsylvania State U	Texas Tech U	Utah State U
Virginia Tech	Washington State U	West Virginia U
<i>Top 10 Masters Programs^{b,c}</i>		
U of Arizona	U of California-Davis	Cornell U
Iowa State U	Kansas State U	U of Maryland
U of Minnesota	North Carolina State U	Purdue U
<i>Other Masters Programs^b</i>		
U of Arkansas	Auburn U	Clemson U
Colorado State U	U of Connecticut	U of Florida
U of Georgia	U of Illinois	U of Kentucky
Louisiana State U	U of Maine	U of Massachusetts
Michigan State U	Mississippi State U	U of Missouri
U of Nebraska	U of New Hampshire	New Mexico State U
North Dakota State U	Oklahoma State U	Oregon State U
Pennsylvania State U	U of Tennessee	Texas A&M U
Texas Tech U	Utah State U	Virginia Tech
Washington State U	West Virginia U	U of Wisconsin
U of Wyoming		

^a Based on Perry's synthesis of subjective evaluations made by agricultural economics faculty

^b Alphabetical order

^c Only nine of the top ten Masters programs participated in the survey

multiple entries by individual students in the sample, the E-mail also provided the respondent with a unique user name and password that was required to access the survey on the Internet. The E-mails were initially sent to graduate students during the first week of December 2000. A second E-mail request was sent to nonrespondents during the first week of April 2001.

Graduate students' E-mail addresses were not available from 5 of the 41 institutions; however, graduate program leaders circulated a print copy of the survey to graduate students in early December 2000. After completing the survey, students returned them to program leaders who then returned the completed surveys to the authors. The electronic and print versions of the survey differed only in that drop-down boxes on the electronic survey were replaced with a multiple choice format on the print survey.

Two weeks after the first E-mail request, 257 completed survey responses were received. Another 198 responses were recorded two weeks after the second E-mail. The overall response rate for the Internet survey was 33.5 percent, after accounting for 121 undeliverable E-mails. Ninety-five of the 350 print surveys were returned, for a response rate of 27.1 percent. Responses were not statistically different for the Internet and print survey versions; therefore, aggregate responses combining both survey versions are reported.

Graduate Students' Demographics

Tables 2 through 5 contain summary statistics of the Ph.D. and masters agricultural economics graduate students' survey responses. Both Ph.D. and masters programs were separated into two

categories, top ten ranked and all other programs, based upon Perry's synthesis of subjective evaluations of agricultural economics faculty surveyed (table 1). Means and standard deviations for the survey responses are reported for each of the two categories. The demographic characteristics of graduate students in top ten ranked and other programs were not generally statistically different, but they provide information about the background of current students that may be useful in promoting graduate programs.

Ph.D. students in top ten ranked programs were nearly 30 years old on average, about 3 years younger than those in other Ph.D. programs (table 2). This difference may suggest that Ph.D. students in top ranked programs either progress through undergraduate and graduate programs more rapidly or do not take time off from school for other pursuits. Students in masters programs averaged less than 27 years of age. Approximately 35 percent of the agricultural economics graduate students were females, although lower ranked masters programs had somewhat higher female enrollments. Nearly half of the Ph.D. students were married, whereas approximately one quarter of masters students were married. Over half of Ph.D. students and masters students in top ten programs were international students. Only one-third of masters students in lower ranked programs were international students, perhaps suggesting that these programs either do not aggressively recruit international students or appeal to their interests.

More than two-thirds of masters students were white (table 2). Fewer Ph.D. students were white: 59 and 44 percent in top ten and other programs, respectively, a statistically significant difference. Ph.D. programs were comprised of more students with Asian

Table 2. Agricultural Economics Graduate Students' Demographic Characteristics

Variable	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.
	<i>Top 10 Ph.D. Programs</i>			<i>Other Ph.D. Programs</i>		
Age, years	29.5 ** ^a	5.3	162	32.6 **	6.6	144
Sex, % female	35	48	161	34	48	144
Marital Status, % married	43	50	161	49	50	141
International Citizenship, %	55	50	157	59	49	143
White, %	59 **	49	162	44 **	50	144
Black, %	3	17	162	7	26	144
Asian, %	25	43	162	32	47	144
Other Race, %	11	32	162	11	32	144
Rural (< 10,000 people) Background, %	18 *	38	162	26 *	44	144
Town (10,000-25,000 people) Background, %	15	36	162	11	32	144
Suburban (25,001-100,000 people) Background, %	23	43	162	18	39	144
Urban (> 100,000 people) Background, %	44	50	162	44	50	144
Farm Background %	75 **	44	159	63 **	48	143
	<i>Top 10 Masters Programs</i>			<i>Other Masters Programs</i>		
Age, years	26.2	4.5	49	26.6	5.9	195
Sex, % female	37	49	49	46	50	193
Marital Status, % married	24	43	49	29	46	192
International Citizenship, %	58 **	50	48	32 **	47	189
White, %	67	47	49	68	47	195
Black, %	6	24	49	9	29	195
Asian, %	12	33	49	10	30	195
Other Race, %	12	33	49	11	31	195
Rural (< 10,000 people) Background, %	35	48	49	34	48	195
Town (10,000-25,000 people) Background, %	12	33	49	18	38	195
Suburban (25,001-100,000 people) Background, %	14	35	49	16	37	195
Urban (> 100,000 people) Background, %	39	49	49	31	46	195
Farm Background %	41	50	49	52	50	193

^a One and two asterisks denote statistically different means between top ten and other programs at the 0.10 and 0.05 levels, respectively

backgrounds compared to masters programs. Less than 10 percent of agricultural economics graduate students were black and about 11 percent were Hispanic or Native American.

Forty-four percent of Ph.D. students were raised in urban areas (more than 100,000 people) (table 2). Relatively fewer masters students tended to have an urban background. In fact, more than a third of masters students were raised in rural areas with populations less than 10,000. Students in top ten programs tended to grow up in more populated areas relative to those in

lower ranked programs. Despite this, more Ph.D. students reported having a farm background than did masters students and the number of Ph.D. students in top ten programs with a farm background was 12 percent higher than Ph.D. students in other programs. This result may reflect personal interpretation of the survey question, which did not specify whether the individual was physically raised on a farm.

Undergraduate Education

The average undergraduate education characteristics of agricultural economics Ph.D. graduate students in top ten programs were statistically different relative to mean responses of Ph.D. students in other programs (table 3). In top ranked Ph.D. programs, a greater proportion of students had Bachelor of Arts degrees. Ph.D. students in top ten programs also tended to have statistically higher grade point averages (GPAs) and Graduate Record Exam (GRE) scores.

Masters students generally had lower GPAs and GRE scores than Ph.D. students (table 3). Mean GPA and GRE verbal scores were not statistically higher for masters students

in top ten ranked programs relative to masters students in other programs. In contrast to Ph.D. students, nearly three-fourths of masters students held Bachelor of Science degrees. This difference is attributable to the different types of undergraduate majors held by masters and Ph.D. students. Figures 1 and 2 show that more Ph.D. students majored in economics (including international, resource, and environmental economics) and other social sciences at the undergraduate level, whereas masters students tended to major in agricultural economics, agricultural business, farm management, and other agricultural and technical sciences. Hence, masters degrees in agricultural economics, many of which concentrate on applied research, may be more appealing to

Table 3. Agricultural Economics Graduate Students' Undergraduate Education And Graduate School Enrollment

Variable	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.
	<i>Top 10 Ph.D. Programs</i>			<i>Other Ph.D. Programs</i>		
B S Degree, %	48 ** ^a	50	162	65 **	48	144
B.A Degree, %	45 **	50	162	26 **	44	144
Undergraduate GPA, tenths of a point (4-point scale)	3.53 **	0.34	140	3.41 **	0.40	124
Math GRE, #	729 **	59	140	678 **	73	95
Verbal GRE, #	573 **	151	140	510 **	171	94
Analytical GRE, #	689 **	90	138	634 **	115	91
Same Undergraduate and Graduate School, %	4 **	20	162	7 **	26	144
Time Between Undergraduate and Graduate School, years	3 **	4	162	5 **	6	144
Visit Department Before Enrolling, %	56 **	50	162	42 **	49	144
Graduate Students in Program, #	69 **	33	153	50 **	29	142
Enrolled Full Time, %	96	20	162	93	26	144
Years in Graduate School, #	3	2	161	4	2	143
	<i>Top 10 Masters Programs</i>			<i>Other Masters Programs</i>		
B S Degree, %	71	46	49	74	44	195
B.A Degree, %	18	39	49	19	39	195
Undergraduate GPA, tenths of a point (4-point scale)	3.40	0.35	40	3.43	0.37	177
Math GRE, #	674 **	112	40	632 **	95	122
Verbal GRE, #	485	160	40	490	150	121
Analytical GRE, #	650 *	125	40	608 *	137	118
Same Undergraduate and Graduate School, %	20 **	41	49	42 **	49	195
Time Between Undergraduate and Graduate School, years	2	3	49	2	5	195
Visit Department Before Enrolling, %	47 **	50	49	75 **	43	195
Graduate Students in Program, #	66 **	39	46	39 **	33	186
Enrolled Full Time, %	94	24	49	91	28	195
Years in Graduate School, #	1	1	48	1	2	195

^a One and two asterisks denote statistically different means between top ten and other programs at the 0.10 and 0.05 levels, respectively

Figure 1. Ph.D. Students' Undergraduate Major

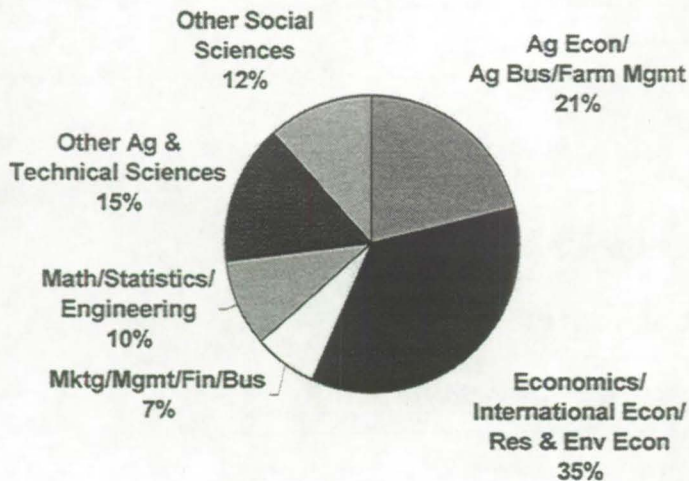
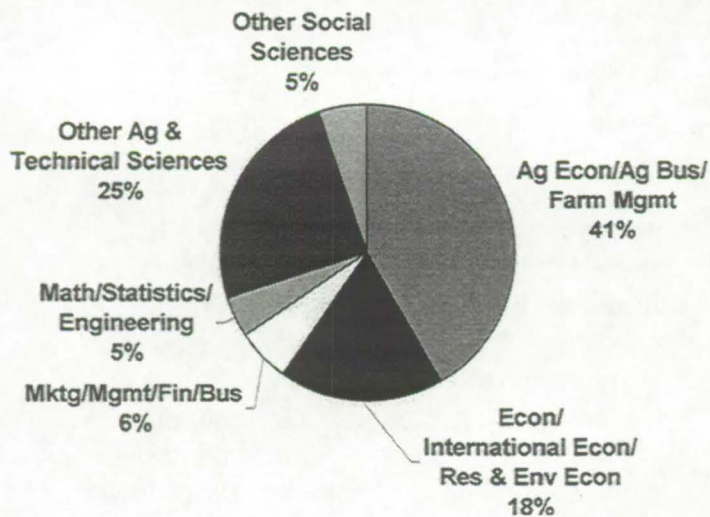


Figure 2. Masters Students' Undergraduate Major



individuals with technical or scientific undergraduate majors.

Relative to Ph.D. programs, masters programs were more likely to attract students from within the same university. Forty-two percent of masters students in lower ranked programs had undergraduate degrees from the same institution (table 3). However, less than 10 percent of Ph.D. students chose to pursue their Ph.D. at their undergraduate alma mater. Top ten Ph.D. and masters programs were less likely to

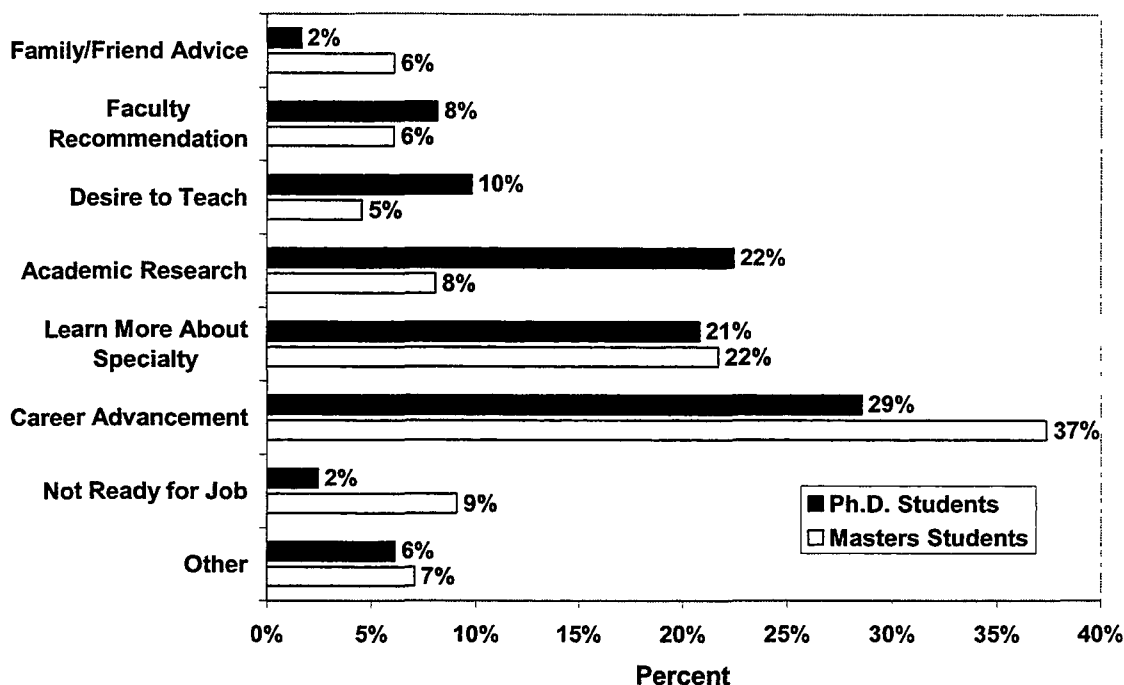
retain undergraduates. This suggests that recruiting undergraduates for Ph.D. programs and top ranked masters programs at the same academic institution is rather difficult as students often pursue graduate degrees at different universities in order to attain personal diversity.

Graduate School Decisions

On average, graduate students in agricultural economics spent between 2 and 5 years pursuing other activities between completing their undergraduate degree and enrolling in graduate school (table 3). The time between completing an undergraduate degree and enrolling in a top ten Ph.D. program was two years less than enrolling in a lower ranked Ph.D. program, indicating that graduate students attending the higher ranked Ph.D. programs are those that decide early in their academic career to pursue doctorate degrees with less inclination to explore alternative opportunities.

Several factors influence the decision to pursue graduate degrees in agricultural economics, and they differ somewhat for Ph.D. and masters students. Thirty-seven percent of the masters students surveyed indicated their main reason for pursuing their graduate degree was for career advancement potential, whereas 29 percent of Ph.D. students cited that as their top reason (figure 3). Instead, more Ph.D. students indicated academic research and the desire to teach as their main reason for pursuing their graduate degrees. Ph.D. students were encouraged to attend graduate school principally by recommendations from faculty whereas masters students were more likely to be influenced by advice from family and friends. These differences suggest the need to recruit differently for masters and Ph.D. programs. Because

Figure 3. Top Reason for Pursuing Graduate Degree in Agricultural Economics

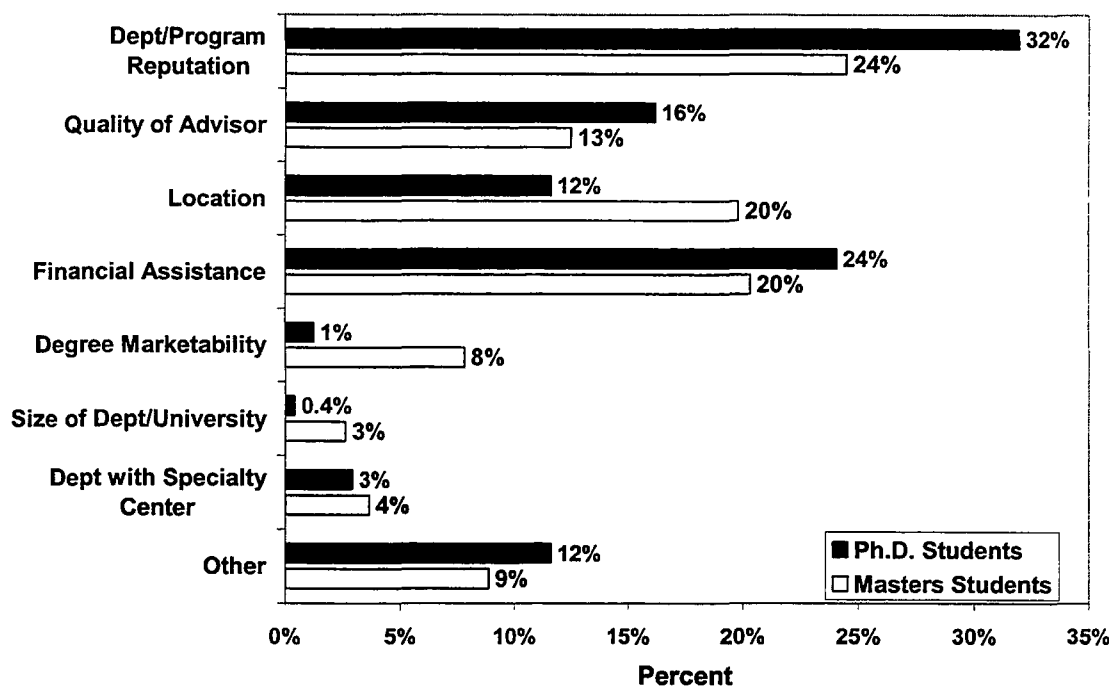


masters students' top reasons to attend graduate school are career advancement, learning about specialty areas, and not being ready for the job market, it is important to target masters programs as applied programs that provide skills and knowledge relevant to industry. Greater emphasis on basic and applied research programs and teaching opportunities are needed to encourage pursuit of doctorate degrees in agricultural economics.

Not only is the decision to attend graduate school determined by many factors, but the choice of which graduate school to attend is also influenced by several criteria important to students. Reputation of the department or graduate program and financial assistance were the first and second most frequently cited criteria in both Ph.D. and masters students' choice of graduate program, respectively (figure 4). Location of the school was of primary importance as often as financial assistance among masters students. Quality of the dissertation/thesis

advisor was also the most important concern for some doctoral and masters students. Size of the department and university and presence of a specialty center in the students' area of study were cited infrequently as the primary criteria in choosing a graduate school. However, program size was statistically larger for students of top ranked Ph.D. and masters programs (measured by total number of graduate students) than for their lower ranked counterparts (table 3). Choice of graduate school may also be influenced by the opportunity to visit the school prior to deciding where to attend graduate school. Fifty-six percent of Ph.D. students in top ten programs visited the department and campus before enrolling in graduate school, statistically greater than those in lower ranked programs. Conversely, the proportion of masters students visiting the department was higher for lower ranked programs, likely because more students in these programs received their undergraduate degree at the same school.

Figure 4. Top Reason for Choosing Agricultural Economics Graduate Program



To differentiate themselves from other graduate programs, administrators and faculty may focus on improving departmental reputation or provide additional financial assistance to graduate students. Both, however, are difficult to do. Improving reputation as a leader in graduate instruction and research is a long term objective influenced by the career paths of previous graduates and interests of current and new faculty in the program. Lower ranked programs could potentially offer additional financial assistance to encourage graduate students to enroll in their program relative to a higher ranked program; however, with recent cuts in university budgets, more funding for graduate students is not likely to be available in the near future.

Funding and Benefits

Amount and type of funding can influence students' choice of agricultural economics

graduate programs. Approximately 80 percent of Ph.D. and masters students received some funding for research (table 4). About 30 percent of students in top ten Ph.D. and masters programs received teaching funding, higher than that of students in lower ranked programs. Few graduate students received funding for extension/outreach work. On average, top ranked Ph.D. programs did not award fellowships more often than lower ranked Ph.D. programs; however, fewer masters students received fellowship funding. Grants supported 15 and 11 percent of masters students at top ten and lower ranked schools, respectively, and 9 percent of doctoral students.

Most of the Ph.D. students received financial assistance to study agricultural economics and to provide research and/or teaching support to the department (table 4). The average annual value of the Ph.D. stipends was \$20,744 for top ten programs and \$20,040 for lower ranked programs.

Table 4. Agricultural Economics Graduate Students' Funding and Benefits

Variable	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.
	<i>Top 10 Ph.D. Programs</i>			<i>Other Ph.D. Programs</i>		
Research Funding, %	79	41	152	79	41	131
Teaching Funding, %	31 ** ^a	46	152	16 **	37	131
Extension Funding, %	2	14	152	4	19	131
Fellowship Funding, %	30	46	152	27	44	131
Grant Funding, %	9	29	152	9	29	131
Monetary Stipend, \$	14,607	5,319	162	14,441	5,550	132
Value of Benefits, \$	6,195	5,660	158	5,680	5,825	125
Total Stipend, \$	20,744	8,504	158	20,040	8,457	125
Students Receiving Stipend, %	95	22	162	90	30	144
Tuition Waiver, %	87	34	162	83	38	131
Health Insurance, %	82 **	38	162	40 **	49	131
Office Space, %	72 *	45	162	68 *	47	131
Computer, %	31	46	162	42	50	131
Housing Allowance, %	1	11	162	2	12	131
Travel Expenses, %	36 *	48	162	47 *	50	131
	<i>Top 10 Masters Programs</i>			<i>Other Masters Programs</i>		
Research Funding, %	74	44	46	85	36	163
Teaching Funding, %	30	47	46	23	42	163
Extension Funding, %	2	15	46	3	17	163
Fellowship Funding, %	11	31	46	17	38	163
Grant Funding, %	15	36	46	11	31	163
Monetary Stipend, \$	13,099	7,375	48	11,490	5,987	172
Value of Benefits, \$	4,495	5,384	47	5,241	5,935	171
Total Stipend, \$	17,473	10,343	46	16,496	9,134	168
Students Receiving Stipend, %	92 *	28	49	83 *	38	195
Tuition Waiver, %	69 *	47	49	83 *	38	174
Health Insurance, %	63 **	49	49	38 **	49	174
Office Space, %	76	43	49	75	44	174
Computer, %	27	45	49	39	49	174
Housing Allowance, %	6	24	49	2	15	174
Travel Expenses, %	27	45	49	37	49	174

^a One and two asterisks denote statistically different means between top ten and other programs at the 0.10 and 0.05 levels, respectively

Approximately \$6,000 of this stipend was received in benefits such as tuition waivers, health insurance, etc. Top ranked Ph.D. programs did not offer significantly higher stipends to encourage graduate students to enroll in their programs. Rather they depended on the program's reputation. The top ten Ph.D. programs did, however, provide health insurance, office space, and

travel expenses to professional meetings more often than did other Ph.D. programs.

The majority of all masters students also received stipends, but significantly more of the students in top ten masters programs received stipends (table 4). The total value of the stipends was not statistically different across the ranking of masters programs:

masters students in top ranked programs received about \$1,000 more than students in other masters programs. Roughly \$5,000 of the total masters stipend was comprised of benefits (e.g., tuition waiver, insurance). Like the Ph.D. programs, top ten masters programs provided health insurance more often than other masters programs. However, tuition waivers were provided less often at top ranked masters programs. These results suggest the lower ranked masters programs may be more resource constrained and attempt to be competitive in recruiting and retaining students by providing tuition waivers, which generally require less monetary expense than health insurance or cash stipends.

Work Responsibility and Output

Assistantships, fellowships, and grants are generally provided to graduate students with the expectation that they contribute to the department's research and teaching programs. The agricultural economics graduate students reported the number of hours per week they were appointed to work on research, teaching, and extension activities, as well as their estimate of the actual number of hours they spend on those tasks (table 5). Ph.D. students were appointed to work, on average, 1 to 2 more hours per week on research than masters students. Teaching appointments were significantly larger for Ph.D. students in top ranked programs relative to Ph.D. students at other programs. However, research and extension appointments did not significantly differ for Ph.D. students by program rank. Ph.D. students in top ten programs reported actually working on research less than their appointment. Ph.D. students in other programs, however, reported working on research and teaching more than their appointed number of hours. The actual

amount of time devoted to research by Ph.D. students in top ten programs is significantly less than those in other programs. The appointed and actual number of hours masters students spent working were not substantially different and did not differ significantly by program ranking.

Graduate student "output"¹ and professional development activities result from the time students devote to research, teaching, and extension. Ph.D. students in top ranked programs spend more time teaching classes; consequently, their output contributions are greater in teaching and assisting in teaching classes than Ph.D. students in lower ranked programs. However, research and extension output was higher for Ph.D. students in the lower ranked programs in terms of published and submitted refereed journal articles; staff, extension, and outreach articles; selected paper presentations; extension and outreach presentations; and professional meetings attended. Perhaps Ph.D. students compensate for attending a lower ranked program by increasing their research and extension productivity in order to be competitive in the job market. Alternatively, research output by students in top ten Ph.D. programs may be lower as a result of trying to publish in higher tier journals with lower acceptance rates. The difference between the top ten and lower ranked Ph.D. programs was only statistically significant for the number of professional meetings attended, likely a result of fewer Ph.D. students in top ranked programs receiving funding for travel.

The number of published journal articles authored by masters students' in lower

¹ Output is defined as classes taught or assisted in teaching and research published through staff papers, research bulletins, extension articles, refereed journal articles, selected paper presentations, and extension/outreach presentations

Table 5. Agricultural Economics Graduate Students' Work Responsibility and Output

Variable	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.
	<i>Top 10 Ph.D. Programs</i>			<i>Other Ph.D. Programs</i>		
Appointed Research Hours, #	13.9	9.7	162	14.7	10.2	143
Appointed Teaching Hours, #	4.6 ** ^a	8.1	161	1.9 **	5.0	143
Appointed Extension Hours,	0.2	1.8	162	0.6	4.5	143
Actual Research Hours, #	13.1 **	13.2	161	16.4 **	14.0	143
Actual Teaching Hours, #	4.6 **	9.4	160	2.3 **	6.2	143
Actual Extension Hours, #	0.2	2.0	161	0.3	2.8	143
Published Refereed Journal Articles, #	0.4	1.0	160	0.5	0.9	144
Submitted Articles to Refereed Journals, #	0.8	1.5	160	0.9	1.5	144
Staff, Extension, and Outreach Articles, #	1.0	2.2	160	1.3	3.2	143
Professional Meetings Attended, #	1.7 *	1.9	161	2.1 *	2.1	144
Selected Paper Presentations, #	1.0	1.4	161	1.2	1.7	144
Extension/Outreach Presentations, #	0.3	1.1	161	0.8	4.3	142
Classes Taught (Sole Responsibility), #	0.7	1.8	161	0.5	1.7	144
Classes Assisted in Teaching, #	1.6 *	2.0	160	1.2 *	1.8	142
	<i>Top 10 Masters Programs</i>			<i>Other Masters Programs</i>		
Appointed Research Hours, #	12.1	9.0	48	12.7	9.2	195
Appointed Teaching Hours, #	3.9	7.0	49	2.6	6.2	195
Appointed Extension Hours,	0.8	5.7	49	0.8	4.2	195
Actual Research Hours, #	10.2	8.6	48	12.2	11.0	193
Actual Teaching Hours, #	3.9	6.8	49	2.7	6.4	195
Actual Extension Hours, #	0.8	5.7	49	0.8	4.4	195
Published Refereed Journal Articles, #	0.0 **	0.0	49	0.1 **	0.4	195
Submitted Articles to Refereed Journals, #	0.1	0.5	49	0.2	0.5	195
Staff, Extension, and Outreach Articles, #	0.6	2.0	49	0.5	1.8	195
Professional Meetings Attended, #	1.4	3.7	49	1.8	3.5	193
Selected Paper Presentations, #	0.4	1.1	49	0.6	1.4	195
Extension/Outreach Presentations, #	0.9	5.0	49	0.5	2.1	195
Classes Taught (Sole Responsibility), #	0.1	0.4	49	0.2	0.9	192
Classes Assisted in Teaching, #	0.9	1.5	48	0.8	1.8	190

^a One and two asterisks denote statistically different means between top ten and other programs at the 0.10 and 0.05 levels, respectively

ranked programs was statistically higher than top ten masters programs, but masters students' publication of journal articles is generally small. Masters students' output more often was contributed through extension/outreach activities and paper presentations. However, these activities were not statistically different between top ten ranked and lower ranked programs.

Conclusions

Agricultural economics graduate students ranked departmental and program reputation as their top criterion in choosing a graduate program. Top ranked Ph.D. and masters programs recruit students selectively based on grade point average and Graduate Record Exam scores. However, the demographic characteristics of students in the top programs are not substantially different. Top ranked programs provide only slightly more benefits and financial assistance on

average than lower ranked programs. Ph.D. graduate student output for research activities is somewhat higher for lower ranked programs, although students in higher ranked programs devote more time to teaching.

It appears that lower ranked Ph.D. and masters programs are attempting to maintain their competitiveness in recruiting and retaining graduate students by offering benefits and monetary stipends comparable to top ranked programs. Students in the lower ranked programs appear to be aggressive in producing various kinds of output and pursuing professional development opportunities, likely with the assistance of advisors and faculty, in order to be competitive in the academic and industry job markets for masters and Ph.D. level agricultural economists.

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