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**CITATIONS, RESEARCH AND AGRICULTURAL
ECONOMISTS IN 25 UNIVERSITIES, 1966-1990**

by

Dale W Adams

and

Gregory L. Gregory

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**CITATIONS, RESEARCH AND AGRICULTURAL ECONOMISTS
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Several times in the past few years information from the Social Science Citation Index has been used to assess the activities of agricultural economists (e.g.: Adams; Beiloc, Polopolus and Correal; Gregory and Adams). It is useful to periodically update these assessments for insights on changes in our profession.

Information Used

Our study is limited to 644 individual who held salaried appointments in 25 departments of agricultural economics in October, 1991.¹ The departments surveyed train most of the Ph.D.s in our profession. We first asked department leaders to provide a list of the agricultural economists on their faculty. These requests produced 761 names. Since some of the people on these lists might be surprised by being labelled agricultural economist, we deleted names that did not appear in the AAEA 1991 Directory & Handbook. This left a total of 644 American Agricultural Economics Association (AAEA) members who were employed in the 25 departments surveyed.²

We next manually tabulated all citations in the Social Science Citations Index

¹Our survey includes units that have names other than departments of agricultural economics but all departments selected employed a substantial number of agricultural economists.

²It was disturbing to find that fifteen percent (117 of 761) of the faculty in these departments--all labelled as being agricultural economists by their department leader--were not AAEA members in 1991.

(SSCI) for each individual for 1966 to 1990. The SSCI assembles citations from about 1,500 core social science journals that were selected because they published articles most often cited in other core journals. The American Journal of Agricultural Economics and other major economic journals are included in this core. Regional journals of agricultural economics, the magazine Choices and other journals with small circulations where agricultural economist might publish or be cited are not included in this core group. The SSCI records all citations in the selected journals, including references to other journal articles, to books, to dissertations, to unpublished manuscripts, to speeches, or even to personal communications.

Caveats

Citation information from the SSCI has three limitations: it includes self citations, it includes homographs (people with the same name), and it recognizes only the first author. We dealt with the first two problems by manually tabulating data; self citations were excluded and we eliminated homographs by evaluating the subject matter mentioned in the title of the cited publication.

The problem of tying citations to joint authors who are not listed first was impractical to solve. Crediting non-first authors would require a complete list of all publications by each of the 644 individuals; only authors could provide these lists. In addition, if the individuals surveyed only had an average of 20 publications each this would increase by more than 20 times the number of data points that must be searched in the SSCI, thereby substantially increasing the costs of the study. It is practical, nevertheless, for individuals who desire to employ citation information for purposes of

promotion, tenure, or pay consideration to use their own publication list and the SSCI to marshal individual citation information.

Several other caveats are appropriate: Agricultural economists produce a variety of useful products and services; citations are only a partial measure of one segment of these efforts. A talented department chairperson will receive no citations for building and leading a productive department; a gifted teacher will not be cited for enhancing the careers of thousands of students; an energetic extension agent will receive no citations for organizing dozens of quality meetings that benefit numerous farmers; and a wise agricultural economist will earn no citations for policy advice that may benefit an entire state or nation.

The quantity of citations received by an individual largely depends on the number of other citing authors who are working on similar lines of research. Thus, individuals who work on narrow research topics such as the economics of rutabaga are less likely to receive citations than are individuals who publish on topics such as economic development. Furthermore, people who deal with topics close to the core of the economics profession, for example theoretical and methodological issues, are more likely to attract citations than are individuals who are doing policy or applied work.

What do citations measure? In large part they are intra-professional research kudos that show the extent to which citing authors--usually other researchers--find a person's work to be useful and mentionable. The mores of the profession result in few negative citations: citing something because it is bad or because the citing author disagrees with the cited publication.

Citations by Place of Employment

As can be noted in Table 1, the AAEA members employed by the Department of Agriculture and Applied Economics at the University of Minnesota received the most citations with a total of 1,906. Departments at Ohio State, Stanford, Maryland, California-Davis, Wisconsin, California-Berkeley, and Florida followed in the total numerical count, all with more than 1,000 citations. These eight departments received almost 60 percent of all citations attributed to AAEA members in the 25 departments.

It can also be seen in Table 1 that the AAEA members in the Department of Agriculture and Resource Economics at the University of California-Berkeley received the largest number of citations per year since the member received their last graduate degree with an average of almost 9 citations. Stanford, Maryland, Wisconsin, and California-Davis followed in this ranking. It is humbling to note that the average number of citations received by the 644 AAEA members was less than two per year; many of us are doing work that does not attract the attention of citing colleagues.

Still another way of ranking departments is by the total number of recent citations received by AAEA members. Information on citations received from 1986 to 1990 is also shown in Table 1. Again, Minnesota ranks first with 765 recent citations; Maryland, California-Berkeley, Ohio State, Wisconsin, and California-Davis follow next in order. Recent citations might be interpreted as showing the departments whose research is receiving the most current attention.

Table 1. Citation Counts by Place of Employment for 644 Members of The American Agricultural Economics Association in 25 U.S. Universities, 1966-90.

University	AAEA Members	Citations Total	Citations 1986-90	Annual Per Capita
Minnesota	34	1,906	765	3.0
Ohio State	36	1,523	561	2.4
Stanford	10	1,392	313	7.7
Maryland	18	1,333	701	3.7
Calif. D	24	1,216	431	3.1
Wisconsin	21	1,141	543	3.2
Calif. B	8	1,139	617	8.8
Florida	42	1,073	381	1.5
Cornell	33	902	320	1.6
Michigan St.	23	780	286	2.0
Iowa St.	35	748	274	1.4
Texas A&M	26	727	356	1.7
Illinois	26	726	327	1.8
N.C. St.	32	636	257	1.2
Purdue	38	495	227	0.9
Missouri	27	445	121	1.0
Washington St.	25	405	128	1.0
Arizona	19	330	152	1.3
V.P.I.	22	309	181	1.2
Oklahoma St.	29	281	133	0.8
Penn St.	23	274	108	0.9
Oregon St.	22	231	112	0.8
Georgia	26	213	82	0.7
Kentucky	23	181	57	0.5
Kansas St.	20	115	57	0.6
Total	644	18,521	7,487	1.9

The concentration of citations in a few departments might be interpreted as indicating a concentration in research that is of interest to other investigators. While we did not analyze the total number of Ph.D. degrees granted by these 25 departments, our guess is that it would be correlated with number of departmental citations.

Concentration is also apparent when the distribution of citations is analyzed across individuals. A summary of this information is presented in Table 2. As can be noted, 45 percent (291) of the 644 individuals have received five or less citations during their professional career. Only 18 individuals--less than 3 percent of the total number--had more than 200 citations and they garnered 35 percent (6,407) of all citations attributed to the group of 644. Not surprisingly ten of these 18 individuals have been named Fellows of the AAEA. Only 7 percent of the individuals surveyed had more than 100 career citations and they attracted 54 percent of all citations garnered by the group of 644.

The person with the most career citations had 640 and the person ranking second had 504 citations. Combined, these two individuals received more than 6 percent of the total number of citations attributed to all 644 AAEA members. The largest average number of citations per year to an individual's work was 26.

Table 2. Distribution of 644 AAEA Members Employed in 25 Universities by Citation Counts, 1966-1990.

University	Number of Citations						Total
	0-5	6-25	26-50	51-100	101-199	200 +	
<u>-Individuals-</u>							
Arizona	8	6	3	2	0	0	19
Calif B	1	0	1	2	2	2	8
Calif D	6	5	6	6	0	1	24
Cornell	12	13	4	2	1	1	33
Florida	21	12	4	4	0	1	42
Georgia	15	10	0	1	0	0	26
Illinois	10	8	4	2	2	0	26
Iowa St.	18	11	2	1	3	0	35
Kansas St.	12	7	1	0	0	0	20
Kentucky	12	9	2	0	0	0	23
Maryland	9	3	1	0	2	3	18
Michigan St.	11	7	1	1	2	1	23
Minnesota	14	11	3	1	2	3	34
Missouri	14	8	3	1	1	0	27
N.C. St.	17	7	4	2	2	0	32
Ohio St.	10	16	6	1	0	3	36
Oklahoma St.	16	11	1	1	0	0	29
Oregon St.	15	4	2	1	0	0	22
Penn St.	13	6	2	2	0	0	23
Purdue	17	13	5	3	0	0	38
Stanford	4	0	0	1	3	2	10
Texas A&M	8	12	4	2	2	0	28
V.P.I	13	5	3	1	0	0	22
Washington St.	10	9	5	1	0	0	25
Wisconsin	5	5	5	2	3	1	21
Total	291	198	72	40	25	18	644
Percentage	45	31	11	6	4	3	100
<u>-Citations-</u>							
Total	468	2,681	2,533	2,969	3,463	6,407	18,521
Percentage	3	15	14	16	19	35	100

Citations by Place of Graduation

Another way of analyzing citation information is by the department where individuals received their last graduate degree. This information is presented in Table 3. As can be noted, the Department of Agricultural Economics at Michigan State University had the most graduates (63) employed in the 25 universities. Minnesota, Iowa State, Purdue, California-Davis, and Wisconsin followed in terms of number of graduates employed. Using total number of citations, graduates from the University of California-Berkeley had the most with 2,633 followed by University of Chicago graduates, and Iowa State graduates. In terms of average number of citations received per year, graduates from the University of Chicago, Stanford, Harvard, and the University of California-Berkeley ranked highest.

Dividing the 644 AAEA members into groups according to number of years since their last graduate degree shows several interesting patterns. Initially, Michigan State, Iowa State, and California-Berkeley were the big three and graduated nearly 40 percent of the 111 individuals surveyed who have 25 or more years of professional experience. For the youngest group--individuals with five years or less since their last graduate degree--California-Davis placed the most graduates, while Michigan State, Iowa State, and California-Berkeley graduates made up only 16 percent of the 124 individuals in this group. It is not clear if this indicates a slide in the perceived quality of some graduate programs and the enhancement of others, or if it shows the discipline of agricultural economics is broadening and departments are looking to a larger number of universities for individuals with skills and training to deal with non-traditional problems. It also

Table 3. Distribution By Place of Graduation of AAEA Members in 25 Departments of Agricultural Economics by Citation Grouping, 1966-90.

Degree Univ.	No. of Years since last degree					Total	Citations	
	0-5	6-10	11-15	16-25	25 +		Total	Average
	-Individuals-						-Citations-	
Chicago	3	4	1	4	4	16	1,927	7.08
Stanford	1	3	5	3	2	14	882	4.14
Harvard	0	1	2	3	5	11	1,087	4.12
Calif B	9	5	6	14	11	45	2,662	3.51
Oregon St.	1	1	5	8	2	17	901	3.13
Maryland	4	0	3	1	1	9	266	2.46
Calif D	13	5	4	9	0	31	662	2.15
Wisconsin	4	8	8	13	7	40	1,168	1.73
Minnesota	6	11	6	11	6	40	957	1.61
Cornell	3	2	5	11	4	25	681	1.58
Kansas St.	0	0	0	2	1	3	101	1.58
Iowa St.	7	5	9	17	16	54	1,554	1.57
Texas A&M	9	2	0	6	0	17	214	1.27
Penn St.	0	2	2	4	5	13	319	1.13
Illinois	10	4	6	6	7	33	540	1.10
Michigan St.	4	13	11	19	16	63	1,264	1.10
Oklahoma	1	3	7	8	2	21	356	1.07
V.P.I	7	3	4	0	0	14	102	0.94
N.C. St.	5	4	0	5	5	19	277	0.92
Purdue	8	9	9	14	4	44	548	0.89
Missouri	7	0	2	8	2	19	232	0.86
Kentucky	2	2	1	0	0	5	28	0.76
Ohio St.	4	2	1	4	4	15	175	0.75
Washington St.	0	5	4	4	0	13	122	0.71
Florida	3	3	3	1	0	10	35	0.44
Georgia	1	0	1	0	0	2	0	0.00
Other Univ.	12	5	16	11	7	51	1,461	2.00
Total	124	102	121	186	111	644	18,521	1.87
Percentage	19	16	19	29	17	100		

might indicate that there has been a leveling in the perceived quality of graduate programs across the 25 universities surveyed.

For graduate students in agricultural economics who are looking forward to academic positions, possibly in one of the departments surveyed in our study, Table 3 provides indirect information on the number of positions that might be available. Over the past three, five-year-periods the 25 departments surveyed have added an average of about 115 beginning members of AAEEA per five year period, or 23 per year.³ This is less than one new employee each year per department. Tight budgets along with declining enrollments in colleges of agriculture may put downward pressure on this small replacement rate in the future.

Conclusions

Even though citations are only a partial indicator of the performance of agricultural economists, they are likely to become an increasingly important measure in the future. Agricultural economists are likely to have fewer undergraduate students and farmers to teach with each passing year and university, state, and federal budgets for teaching and extension are almost certain to decline in real terms. Our profession must increasingly sustain itself on more research and graduate training, particularly for students from abroad.

³This under states number of new employees hired by the 25 departments surveyed. Some new employees are individuals who transfer from one department to another within the 25 universities surveyed. Other new employees switch to positions outside the 25 universities or are hired on only a temporary basis and thus stay with the university only a few years.

Citations provide useful insights into what colleagues think of our research activities. They can be used as indicators of research quality across departments; they show which departments are gaining or losing ground; they indicate departments that have trained individual who later receive significant numbers of citations; they identify potential major professors whose research is receiving the most attention by other researchers; and they also reveal young professionals who are being recognized for their research efforts. We conclude that academic agricultural economists should focus on enhancing the quality of their research activities and in doing so ought to pay more attention to citation counts.

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