

AGRICULTURAL EDUCATION AND DAMN STATS II: GRADUATE EMPLOYMENT AND SALARIES

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ABSTRACT

Careers advice to students regarding opportunities in agriculture is commonly reported as negative despite employment prospects for graduates being significant in recent years. Given the confusion in the use of data about graduate completions, the Australian Council of Deans of Agriculture explored whether such confusion extended to graduate careers advice through the Graduate Destination Survey. In cooperation with Graduate Careers Australia, ACDA has undertaken an analysis which shows that there is a significant discrepancy in the employment outcomes when agriculture and environment graduates are considered independently. Such data are usually combined and show employment levels much lower than actual for agriculture.

BACKGROUND

The first paper describes how information regarding graduate completions in agriculture can be misleading where the data are misinterpreted. Such misinformation has had a profound dampening effect on the choice of careers, as students and their mentors have been reluctant to consider a career in agriculture because of the inaccurate perceptions created.

The other aspect of this scenario is the publicity about employment and salaries. One of the most recognised and trusted purveyors of data on employment levels and salaries of new graduates is Graduate Careers Australia (GCA) which surveys the class of graduating students annually, around four months after they complete their awards, in order to establish the extent of employment for the various course disciplines. The Australian Graduate Survey (AGS), of which the Graduate Destination Survey is a component, has been conducted since 1972 (www.graduatecareers.com.au) and in its own words represents “the only nationally consistent measure of graduate outcomes in Australian higher education”.

As with the completions data described in Paper I, the published outcomes of such surveys do not align with the experiences of university agriculture schools and employers of agricultural graduates. Except for research careers, the job market has been buoyant since at least 2007 based on the quantity of advertisements in papers and on the internet, as monitored by Rimfire Resources and described by the Australian Council of Deans of Agriculture (ACDA) in Pratley (2012a). The question arises regarding the discrepancy

that exists between the outcomes of the Graduate Career Surveys and the experience of universities in their dealings with graduates and employers. This paper explores the extent of the discrepancy.

GRADUATE CAREERS DATA

Data were sought from Graduate Careers Australia for both employment levels of graduates and starting salaries. The data period was 2003 to 2012, a decade in duration. It was apparent from the GCA website that the employment surveys were based on the Field of Education code 05 as described in Paper I (Pratley 2014). The data published each year by GCA show a category “Agricultural Science” but there is no mention of “Environmental Science/Management”. It is clear that the data collected for FoE 05 are then used at the 2-digit code level to describe agriculture in the market place. The question is whether such portrayal is reasonable or whether there needs to be some dissection of the FoE at the 4 and 6 digit codes to enable a more appropriate market place analysis. GCA provided the data to the 6-digit codes for FoE 05 and also for ‘080321 Agribusiness’ to ACDA for analysis.

Figure 1 shows the number of agricultural data entries relative to those of the total for the FoE 05 respondents. Agriculture represents from 20% to 13% of the total, the lower proportions being from the most recent data collections and so the portrayal of FoE 05 as agriculture is not a true reflection of the sample where intra-differences occur. The GCA indicates a response rate consistently around 60% for the survey generally. In comparison with the graduate completion data (Pratley 2013), however, the survey response rate for agriculture ranges from 23% to 40% whilst for environment the range is 30% to 43%. The GCA survey data for FoE 05 show that number of entries for environmental graduates is 2.2 to 4.5 times those for agriculture over the period of study reported here. It follows therefore that considering these cohorts together will more closely represent environmental graduates than agriculture graduates where any differences exist. The question of interest is whether there are differences between such cohorts.

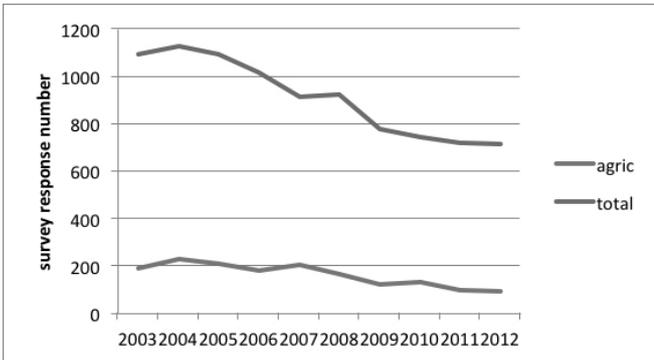


Figure 1 The number of agriculture graduate responses in relation to the total number of respondents in FoE 05 for the period 2003-2012

Employment. The GCA survey categorises respondents as 'in full-time employment' or 'seeking full-time employment'. In the latter case there is a split between those in part-time employment seeking full-time work and those not working. The data used in the analysis reported in this paper are those relating only to full-time employment. The converse (ie 100% less those in full-time employment) is often used, though not strictly correctly, as the level of 'unemployment'. Figure 2 shows the 'full-time' records for the decade 2003-2012 for the FoE 05 and for the agriculture and environmental cohorts within that Field. The FoE 05 outcome suggests that full-time employment has ranged from 70-80% over the period, being around 70% for the last three years or so. This is the figure that has been used by GCA to represent the employment status of agricultural graduates. The agriculture cohort however is substantially different from that representation, being between 80 and 90% over the decade and around or above 90% in recent years. The environmental cohort on the other hand has, for the majority of years, hovered in the 60-70% of full-time employment band, and particularly so in the recent years. Officially therefore agricultural employment has been substantially underestimated and environmental employment exaggerated by the way the data are used.

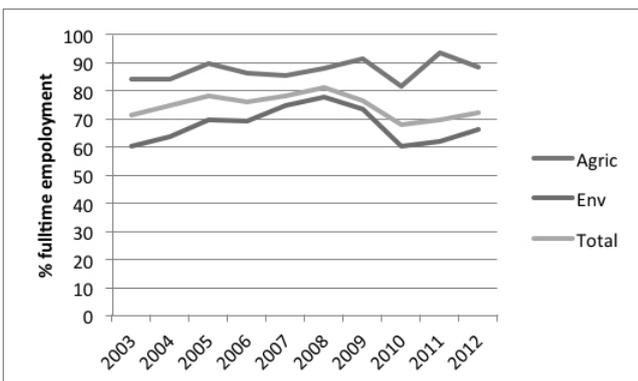


Figure 2 The level of full-time employment after graduation of the agriculture cohort, the environmental cohort and the total FoE 05 cohort for the period 2003-2012

Figure 3 shows the data in a different way, by displaying the range of full-time employment levels across the decade for each of the cohorts 'agriculture', 'environment' and 'FoE 05'. This depiction shows the ranges for agriculture and environment to be mutually exclusive over the decade with the FoE 05 range closely approximating that of environment and barely overlapping with that of agriculture. The GCA publications therefore clearly misrepresent the employment of agriculture graduates to their significant disadvantage. There is no suggestion that this is deliberate but rather an artifact of the way in which data are collected and then interpreted.

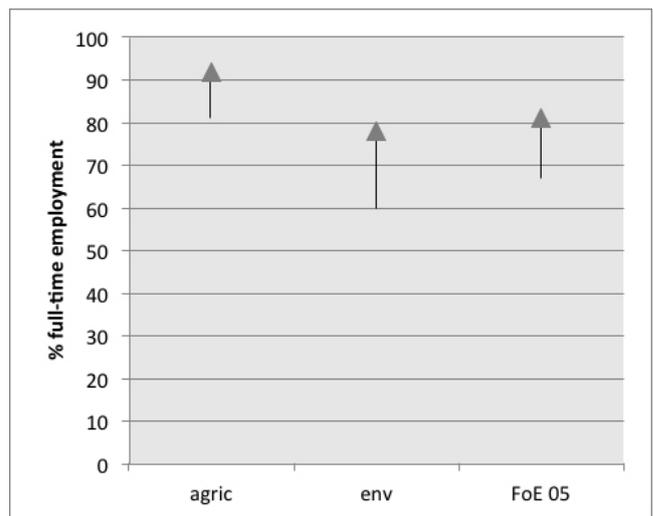


Figure 3 The ranges in percentage of fulltime employment for the agriculture, environmental and FoE 05 graduate cohorts for the period 2003-2012

The extent of the discrepancy over the period of the decade is shown in Figure 4. The percentage difference between the actual employment levels for agriculture graduates and those published by GCA, represented by the same data, ranges from 9 to 25%, the largest discrepancy occurring in the period 2009-2012 when the shortage of graduates has been most acute.

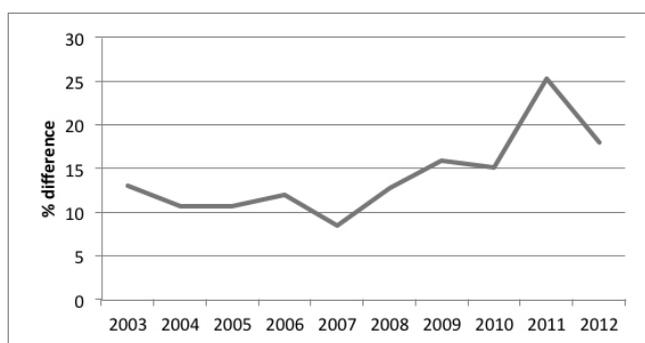


Figure 4 The percentage difference between full-time employment of all agriculture graduates and those for FoE 05 for the period 2003-2012

The data were also broken down into their primary industries components (Figure 5) to show that agriculture, agribusiness and horticulture/viticulture in the main were consistently in excess of 80% full employment whereas the cohort as a whole (ie FoE 05 including the primary industries) was, except for one year, below the 80% cutoff and closer to 70% in most years. The numbers for forestry and aquaculture are too low for meaningful conclusions to be drawn for those categories.

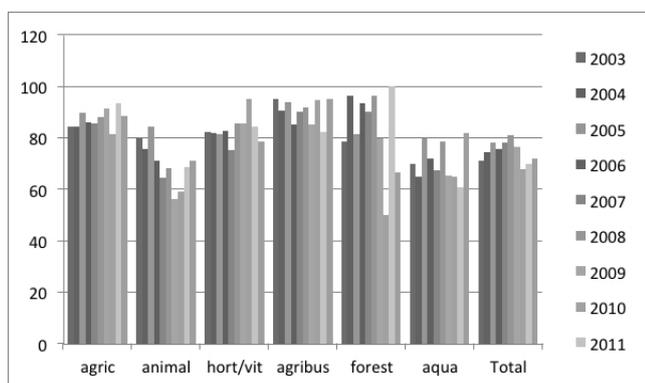


Figure 5 The proportion of graduates in primary industry categories in full employment for the period 2003-2012

Salaries. As with employment data, salary information was provided by GCA for the same decade. Respondents were asked to provide their gross (pre-tax) annual salary in Australian dollars. Records for salary levels represent a much smaller proportion of the survey recipients, presumably because of concerns about privacy issues. For the FoE 05 total cohort the responses ranged from 22-31% of recipients whereas the agriculture cohort response range was 48-62%. Why agriculture graduates would be more forthcoming with salary details than the overall cohort remains an unknown.

The data provide the number of graduate respondents and the median salary for that cohort in that year. The *median*

salary makes it difficult to combine cohorts and so the data are not manipulated in this analysis. Over the period of study the number of respondents has almost halved and the sub-cohort numbers in some cases are in single digit numbers and have not been used further except as a component of the full cohort. Where there are 10 or more in almost all years of the analysis the data are provided. The numbers are represented in Figure 6a for the subgroups considered. Agribusiness had been included in the analysis because of its relevance even though it is not part of the FoE 05 category and its numbers are not included in the Total for the FoE 05 field. Figure 6b then shows the median salaries for the subcohorts and total cohort for FoE 05.

The analysis suggests that the median salary level for graduates in full-time employment from FoE 05 (170 respondents) in the GCA survey was around \$52K in 2012, there being a steady annual increase (just under 6% per year) in the values over the decade of study. For the agriculture cohort the median salary in 2012 was \$55K (7 respondents) and the agricultural science cohort produced a median salary value of \$52K. Combining those cohorts would raise the median but to what extent is unclear. An estimate of \$53K would seem reasonable. Agribusiness reported a median salary of \$51K.

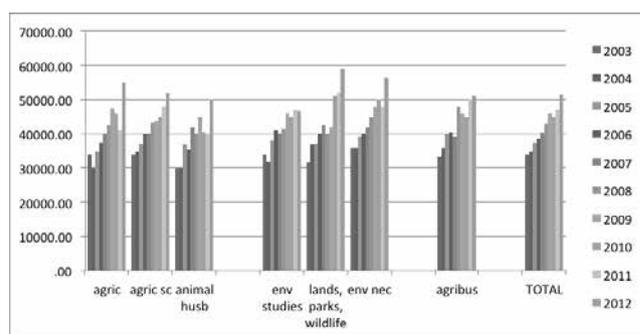


Figure 6a Number of respondents in respect of the GCA salary survey for the FoE 05 total cohort and subcohorts where greater than 10 respondents, 2003-2012.

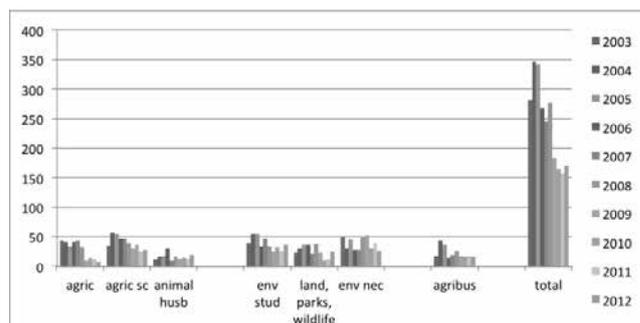


Figure 6b Median salary of respondents to the GCA salary survey for the FoE 05 total cohort and subcohorts where greater than 10 respondents, 2003-2012



Given the relatively small cohorts in the data for some classifications, it is difficult to judge whether the salaries are representative enough to guide prospective students in their choice of career. To provide some validation a comparison is made with a survey of agriculture graduate 'trainees' in agribusiness companies undertaken by graduate employment company Rimfire Resources. The analysis of salary in this case evaluated the salary packages of the employees and the outcomes reflect more than 60 respondents per year for the four years under consideration. Data are presented for median and average salaries in Figure 7 for the years 2010 to 2013. In 2012, which relates to the latest of the GCA data, the median base salary was \$46K which is then supplemented by package arrangements to a median of \$52K. The average values are \$47K and \$53K respectively. In 2013 the median values for base salary and salary package had risen to \$47K and \$53K respectively and average values to \$49K and \$56K.

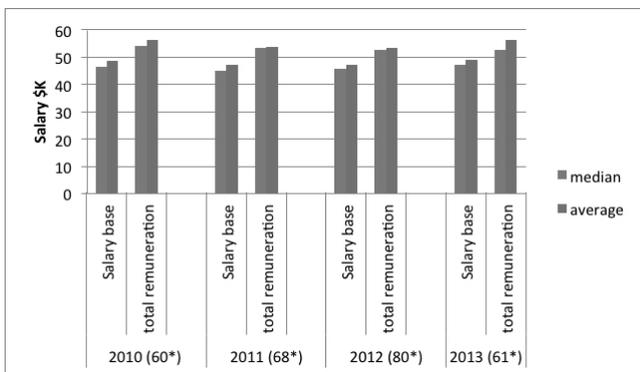


Figure 7 The median and average base salary and package salary of agriculture graduates from the Agribusiness Salary Survey, Rimfire Resources, 2010-2013 (*are numbers of respondents)

Figure 8 shows that the top 25% of employees had a base salary of at least \$53K and a package salary of at least \$57K in 2012 and this had risen to a minimum \$53K base and minimum \$65K package in 2013.

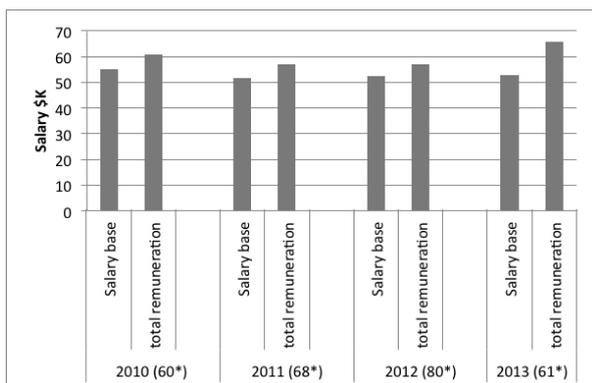


Figure 8 The 75th percentile base and packaged salary of agriculture graduates from the Agribusiness Salary Survey, Rimfire Resources, 2010-2013 (*are numbers of respondents)

These comparisons suggest that the information from both sources is similar for median values. Whether median value is the best indicator is a debate for another time. Indicating the range might be a useful addition. The important question here is whether the portrayal of agriculture is representative of the data. To further the evaluation the portrayal of agriculture in the GCA publication GradStats (December 2012) is reviewed. Table 1 shows the ranks determined by GCA for starting salaries across a range of fields of study. This is compared with rank based on the GCA median salaries. It is not clear why these rankings would differ. For agricultural science, the GCA rank in the publication is shown as 17th although median salaries suggest the rank as 12th.

Table 1 Rankings of Field of Education based on GCA determination (adapted from GradStats 2012)

Field of Education	Rank	median salary \$K	rank on median salary
Dentistry	1	80	1
Optometry	2	79	2
Earth sciences	3	73	3
Engineering	4	63	4
Medicine	5	60	5
Education	6	56	7
Mathematics	7	57	6
Computer science	8	52.5	10
Law	9	53	9
Paramedical Studies	10	52	11
Physical science	11	56	7
Social work	12	50	12
Psychology	12	49	15
Accounting	15	50	12
Biological sciences	15	48	17
Economics/Business	15	48	17
Architecture/Building	17	48	17
Agricultural science	17	50	12
Veterinary Science	19	45	20
Humanities	20	45	20
Social sciences	20	47	19
Art/design	22	40	22
Pharmacy pre-registration	23	39	23



The analysis undertaken in this paper suggests that the median salary for agriculture as distinct from FoE 05 is closer to \$53K (shaded figure in Table 1) than the published \$50K. Both the GCA data at 6-digit level and the Rimfire Resources data suggest that \$53K is an appropriate estimate. That then puts agriculture in the top 10 for the graduate salary stakes rather than the official 17th position determined by GCA.

DISCUSSION

Why does all this matter? It matters because the GCA is a reputable and accepted source of advice for prospective students. Its findings are widely used by careers advisors and are available to parents and students alike. The portrayal of perhaps 30% unemployment rather than the actual full employment is an immediate turnoff for students and the salary ranking of 17 v 10 also provides no incentive for their further consideration.

A survey of more than 500 Victorian secondary school students in 2012 showed the lack of understanding of careers in agriculture (Winkler, 2012). That is not surprising, with only 4% showing interest in seeking more information on agriculture courses. However, more than 40% indicated that a starting salary of more than \$60,000 would make them consider studying agriculture. Salary levels do matter.

A Review into agricultural education in NSW (Pratley 2013) showed that many careers advisors discourage students from careers in agriculture on the basis that they perceive that there are no jobs and no future in such careers. The combination of agriculture with environmental graduates by GCA in employment and salary, using just FoE 05 data, does distinctly confuse the situation for agriculture and reinforces the negativity to agriculture common in career advice in schools. Over recent times that misrepresentation has been a significant disadvantage to agriculture.

This simple analysis emphasises the need to separate agriculture and other primary industries from environmental course data. The capabilities of such graduates are not interchangeable with environmental graduates having little or no training in primary production. Clearly demand for the two groups differs and their combination misrepresents both.

ACKNOWLEDGEMENT

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REFERENCES

- Graduate Careers Australia (2012) GradStats 2012. www.graduatecareers.com.au
- Winkler, T (2012) Drought of understanding - A snapshot of secondary students' perceptions of agriculture. Twig Marketing, Brunswick, Vic. www.twigmarketing.com
- Pratley, J (2013) Review into Agricultural Education and Training in New South Wales. NSW Government, ISBN 978-0646-59653-2
- Pratley, JE (2014) Agricultural education and damn statistics I. Graduate completions (in press)