



Australian
Farm Institute

Professional Agriculture – A Case of Supply and Demand

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The agricultural industry is at the crossroads in terms of workforce capacity. Evidence is presented that there is a sizeable job market in agriculture and more than 4000 jobs per year are consistently being advertised seeking agricultural professionals. Conversely the number of graduates being supplied by Australian universities continues to decline significantly and is less than 20% of the number needed to satisfy the job market. Capacity therefore looms as the most significant issue for the agricultural industry as it endeavours to take advantage of the opportunities created by food security. The challenge is to make prospective students aware that careers in agriculture are at least as interesting, rewarding and challenging as in most other industries.

Professional Agriculture – A Case of Supply and Demand

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Introduction

Agriculture has always been a complex business. In the 21st century, however, the degree of complexity has intensified. Not only do farmers and their advisers need to contend with the usual production issues, they also need to be increasingly self-reliant in the marketing of their products, ensuring market quality and supply. There has always been a need to deal with climate variability but predictions indicate that this variability will increase and there is increased expectation for farmers to manage the risk of drought. The compliance aspects of the workplace continue to increase as occupational health and safety provisions apply together with, *inter alia*, pesticide management, flock care and stewardship of genetically modified (GM) crops. At the same time agriculture manages over 60% of the Australian landscape and thus assumes the responsibility for native vegetation, landscape sustainability, biodiversity and the like. Technologies such as Global Positioning System (GPS), precision agriculture and remote sensing are now having impact and there is increasing expectation on agriculture to address carbon emissions and play its part in the carbon economy.

Farmers need increased personal capacity but thus will need greater reliance on expert advice from outside the farm. Research and development (R&D) will continue to be needed to develop systems and technologies that allow productivity gains to maintain farm profitability and address the needs and opportunities in food security nationally and globally. The industry, from the farm, the service and post-farmgate sectors and in R&D, requires a workforce which is highly educated, highly skilled and with an image and reputation that is attractive to the best and brightest. As markets become more discriminatory in respect of quality and production practices, accreditation will become increasingly important and the industry will need to have robust mechanisms in place to assure those markets.

Benchmarking Education in Agriculture

On any analysis, the educational standards of the agricultural industry do not stand up well to scrutiny (Figure 1). Over the past quarter of a century the proportion of the Australian community with tertiary qualifications has increased from just below 10% of the workforce to more than 25%. In contrast, in the agricultural sector, only 4% were degree holders in 1984 and in 2009 that proportion has risen to only around 7%. The gap is widening, yet food production would seem to be an essential service industry where standards should be unquestionably high.

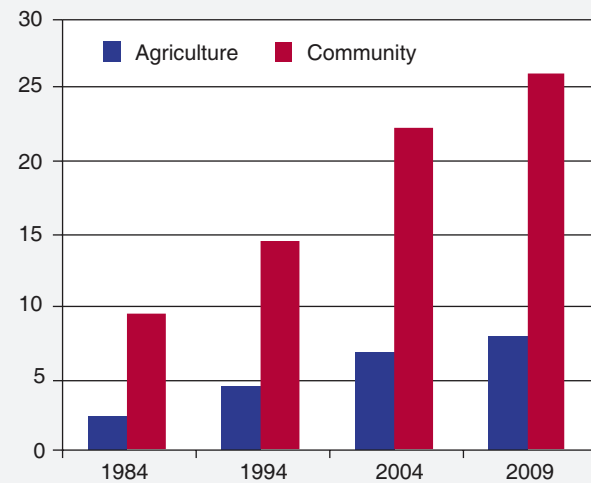


Figure 1: Relative proportions of the agricultural sector and the Australian community with tertiary qualifications, 1994–2009.

Source: Australian Bureau of Statistics.

The comparisons are also stark if the relative proportions of the workforce without post-school qualifications are considered (Figure 2). Whereas the Australian community at large has reduced the proportion from 54% in 1984 to around 33% in 2009, the agricultural industry has achieved a reduction from 73% to only 58% in the same time – that gap also continues to widen.

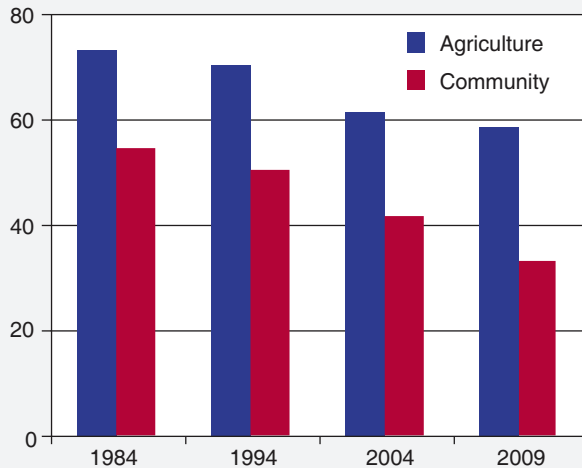


Figure 2: Relative proportions of the agricultural sector and the Australian community with no post-school qualifications, 1984–2009.

Source: Australian Bureau of Statistics.

It is clear from these statistics that education of its workforce has not been a high priority for the agricultural industry. Yet this became a concern for the Heads of Agriculture Schools within universities where declining enrolments were being experienced whilst at the same time industry employers were complaining about the lack of graduates. In order to address this issue in particular, the Australian Council of Deans of Agriculture (ACDA) was formed in 2007. Further investigation by the ACDA revealed the government policy position at the time was that graduate supply was plentiful but that job prospects were poor. This conflicted with the experience of the ACDA members who embarked on a data gathering exercise to clarify the conflict. In this process it was discovered that graduate numbers used by government included all environmental science and management graduates and that the job market projections were based on advertisements placed only in selected metropolitan newspapers.

Graduate Supply in Agriculture

Data were collected from all universities with undergraduate courses in agriculture and in related areas. Such data were collected from 2001 until the present to establish trend lines. Figure 3 shows the graduate completions in agriculture courses over time and Figure 4 shows the data for agriculture and related courses for the same period. Where available, comparisons are made with the 1980s using data derived from the ‘McColl Report’

(McColl et al. 1991). Completions in the latter case were estimated in proportion to enrolments in the various levels of qualifications and so there are likely to be small errors in the absolute numbers used, although comparisons are not likely to be significantly compromised.

In the late 1980s there was a marked increase in the number of graduates with agriculture degrees, due largely to the conversion from diploma qualifications to degrees in the Colleges of Advanced Education (CAE) sector. Diploma qualifications have largely disappeared from tertiary education institutions since then. There was also a small component of 2-year associate degrees at that time and they have also become virtually extinct. Together degrees and associate degrees in agriculture delivered to industry around 800 graduates in the late 1980s. In the 21st century, numbers had declined to around 500 in 2001 and that decline has continued such that only 300 degree graduates in agriculture entered the workforce at the end of 2010. There has been a 40% decline in last ten years.

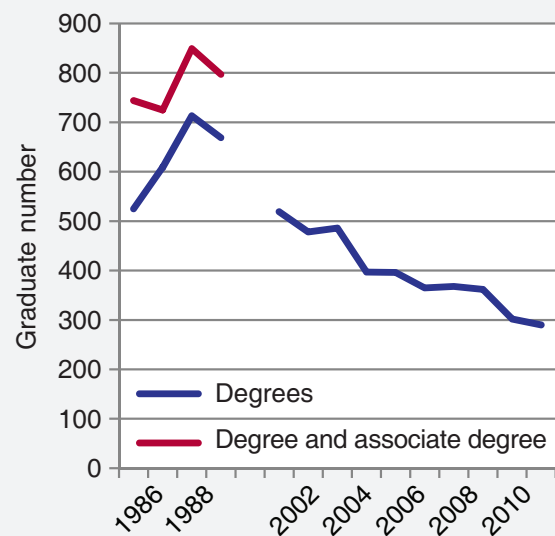


Figure 3: Graduate completions in 3 and 4 year agriculture courses from Australian universities for the period 2001–09 inclusive and estimated from McColl report for years 1986–89 including 2 year associate degrees.

The agricultural industry, however, also receives value from graduates in related degrees such as horticulture, agribusiness, animal science and agricultural economics (Figure 4). Whereas the total graduation cohort from agriculture and agricultural-related degrees was around 1000 per year in

the early part of the recent decade, the number has declined to around 800 in 2010, ie a 20% decline. However it should be noted that a sizeable proportion of these are animal science graduates, only some of whom (probably fewer than half) are interested in livestock production with the remainder focused on wildlife and companion animals. The total available to the agricultural workforce then is closer to 700. Whereas animal science degrees were not available for the period studied in the McColl Report, there has been a proliferation of university courses in animal science in more recent times to capitalise on high student demand and, in many cases, to capitalise on the overflow of high quality students unsuccessful in their attempts to gain entry into Veterinary Science.

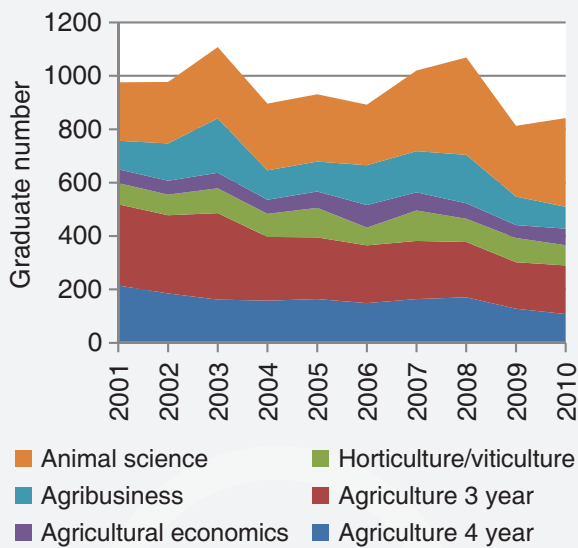


Figure 4: Graduate completions in 3 and 4 year courses in agricultural and related areas from Australian universities for the period 2001–09 inclusive.

The data in horticulture reveal a substantial decline as well. This sector during the 1980s was characterised by a relatively small cohort of degree graduates and a high associate degree activity. These consolidated into degrees and at the turn of the century there were about 120 graduates per year. This reflected the buoyant position of viticulture at that time but there has been a decline in the number of providers related to the downturn in the grape industry. These numbers also include graduates in the amenity horticulture field as well as the very few in production horticulture. Thus the production horticulture industry will be dependant on agriculture graduates for its professional workforce, as before, and so will have to compete with the rest

of the agricultural industry for employees. Several universities in recent times have deleted horticulture degrees from their profile.

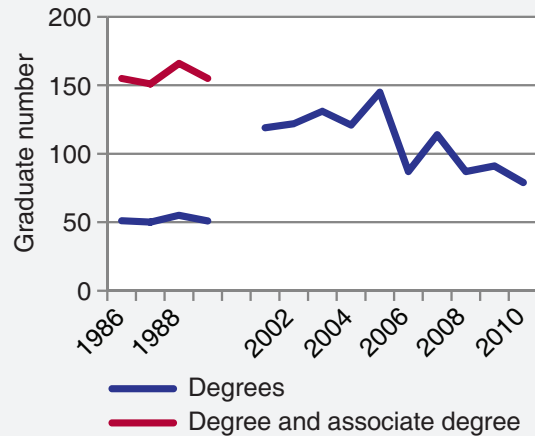


Figure 5: Graduate completions in horticulture/viticulture from Australian universities for the period 2001–09 and the degree completions estimated from the McColl report for the period 1986–89 including 2 year associate degrees.

The discipline of agricultural economics did not have associate degrees in the 1980s and so comparisons are straightforward. Completions back then were around 80 to 90 per year but in the recent decade is now around 50 per year except for a peak in 2006. Only three universities provide graduates in this area with the University of Sydney providing the vast majority. Student demand suggests that there will be no new providers in the market any time soon.

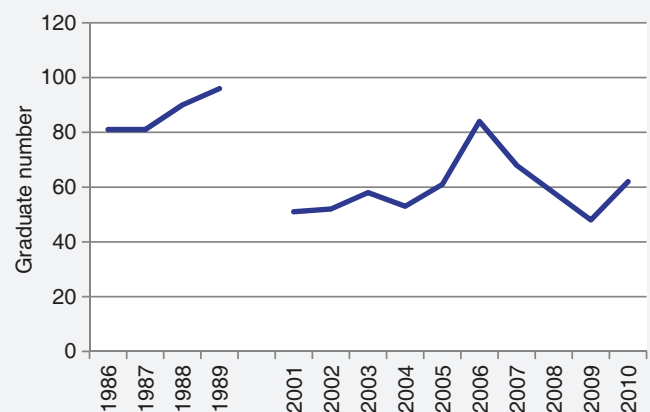


Figure 6: Graduate degree completions in agricultural economics for the period 2001–09 inclusive together with estimates of degree completions from the McColl Report for 1986–89.

In agribusiness/agricultural commerce, the main qualification in the 1980s was the associate degree being around 80% of the market. Together with degrees, these awards provided more than 200 graduates per year. In the evolution to degree-only awards in the last two decades there has been considerable fluctuation around 150 graduates per year declining to fewer than 100 in 2010.

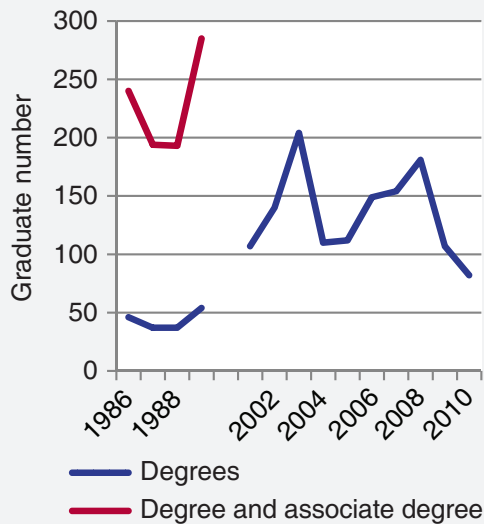


Figure 7: Graduate degree completions in agribusiness for the period 2001–09 inclusive together with estimates of degree completions from the McColl Report for 1986–89 including 2 year associate degrees.

Workforce Demand

The job market in agriculture is based on the monitoring of job advertisements in state rural and metropolitan newspapers and on the internet over a four year period, 2007–10, presented quarterly. The detailed methodology has been provided in an earlier paper on this topic (Pratley & Hay 2010). It is recognised that there is the likelihood of an advertisement being placed both in print and on the web and subsampling suggests that this is of the order of 20% for agribusiness and conclusions have been adjusted accordingly. It is also recognised that there is the potential for ‘churn’ where one

advertisement is generated by the filling of another vacancy but this is balanced by jobs in local media, by word of mouth and direct targeting of employees, none of which is considered here. There is thus no adjustment for ‘churn’.

Data are provided for agribusiness and production for the four years of study (Figure 8). Total job numbers are consistently in aggregate around 4000, or 3600 per quarter after adjustment for advertising overlap in agribusiness. Despite the drought, which was very severe in 2008 and 2009, the number of jobs was not affected to a large extent although a rise is evident towards the end of 2010 as confidence returned with the breaking of the drought in eastern Australia.

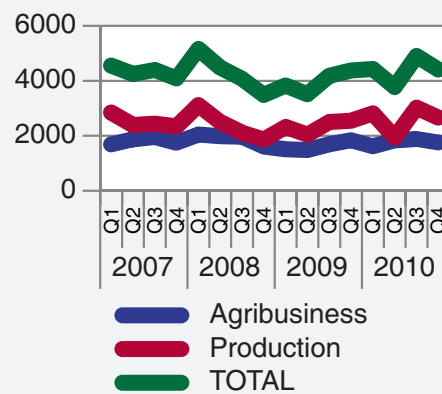


Figure 8: Number of job advertisements per quarter in agribusiness and in agricultural production for the period 2007–10 inclusive.

For 2009 and 2010, production advertisements have been categorised into management and non-management (Figure 9) to enable a better understanding of the required workforce. In the production sector, there was a consistent demand for some 2000 non-management employees per quarter and at least 300 managers per quarter. Also evident in the data is the differing role played by the internet in advertising jobs. In agribusiness the ratio of paper to internet advertising is around 5:4 whereas for on-farm management roles the ratio is 3:1 and for non-management jobs it is more than 10:1.

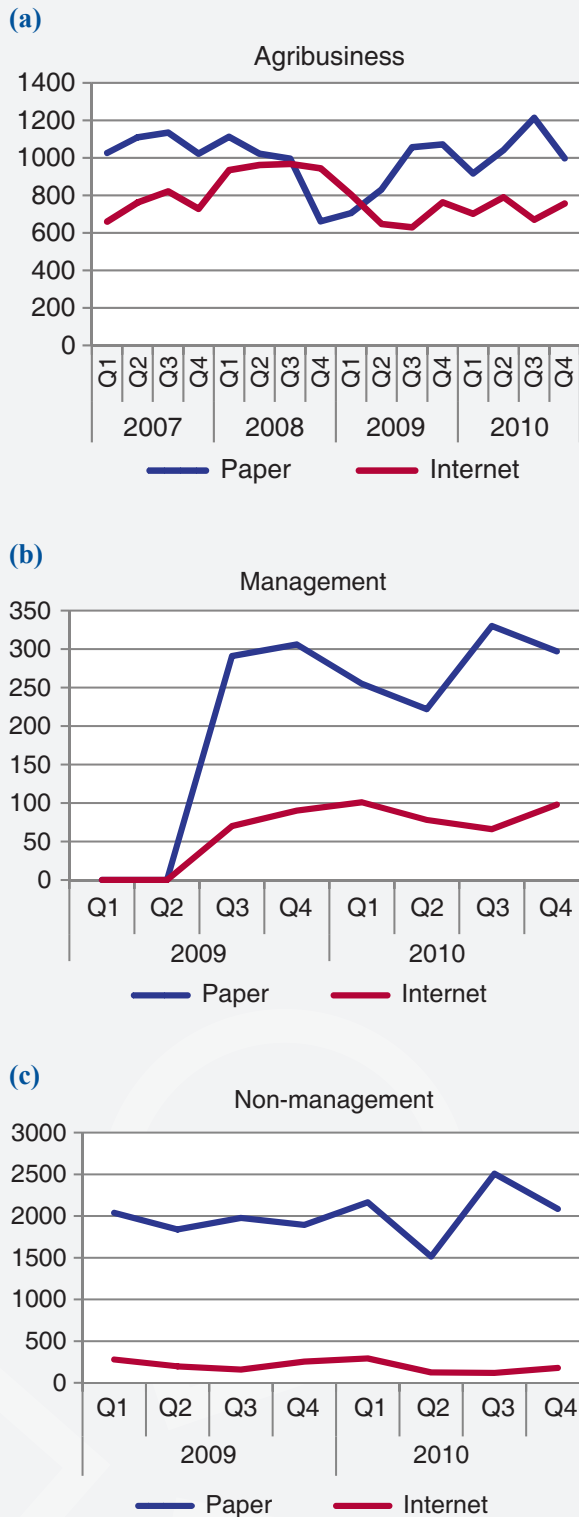


Figure 9: Influence of the internet in job advertisements by quarter in (a) agribusiness in 2007–10, (b) management in production in 2009–10 and (c) production non-management in 2009–10.

Figure 10 shows the categories of jobs per quarter for the agribusiness sector. Particularly strong were the livestock and cropping categories but there were at least 100 advertisements per quarter for all categories.

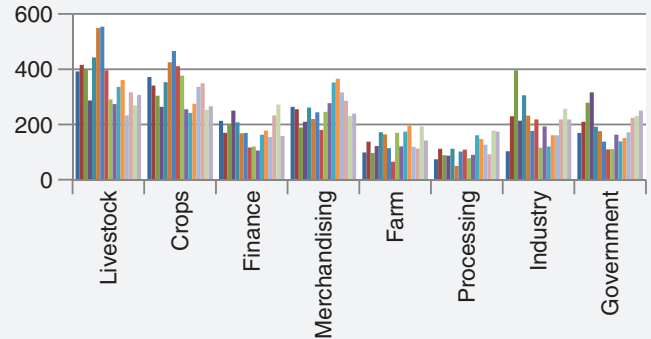


Figure 10: Number of job advertisements per quarter in various sectors of agribusiness for the period 2007–10 inclusive.

The relative proportion of jobs advertised in the metropolitan press is particularly low when compared with those in rural papers. The exceptions are in Tasmania and Western Australia. In the states of NSW, Victoria and Queensland in particular, metropolitan newspapers have very little influence on the job market in agriculture.

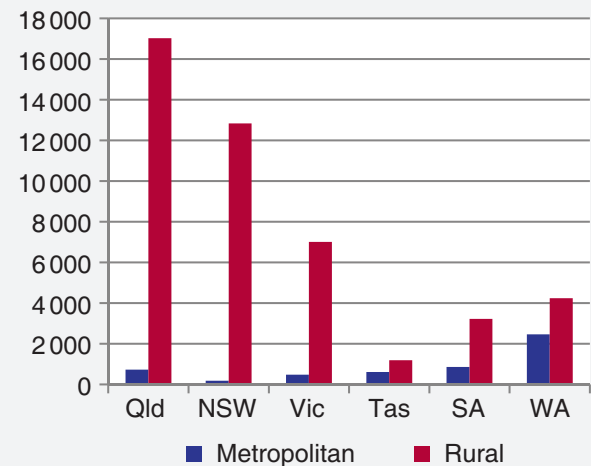


Figure 11: Relative number of job advertisements in metropolitan and rural newspapers in each state for the period 2007–10 inclusive.

Discussion

Regardless of the needs of the industry the level of educational attainment in the industry is unacceptable in a community which has education as a high priority. It is clear that there has been much complacency towards the improvement of skills and knowledge of its workforce at a time when the rest of the community has embraced the opportunities and moved well ahead. It is not surprising therefore that the image of the industry is not seen as progressive and the younger generations have not seen the opportunities for careers in agriculture that are seen in other industries. The reality however is that the greater expectations placed on producers and the associated services requires a highly educated and skilled workforce and there are opportunities for exciting and rewarding careers. The evidence is provided that the industry has a strong employment market.

The data presented in this paper show that there is a job market of about 1600 per quarter in agribusiness. If it is assumed that 70% have a need or desire for graduates to fill those positions then there is a demand for around 4500 graduates per year. To this should be added the 1200 or so production management positions annually. Whilst the percentages used could be debated, what is clear is that the number is sizeable.

The universities are nowhere near satisfying the current market. The data show that only around 300 agricultural graduates per year are now produced. This number grows to over 700 per year when related courses are considered. These numbers assume that there is no leakage of these graduates out of agriculture – this leakage can be significant. At best therefore the universities are producing only 700 or so graduates for a job market of more than 4000. Further, the universities would need to produce about 2300 graduates just to maintain the current (7–8%) graduate level of education qualifications (Pratley & Copeland 2008) and that is nowhere near being achieved.

Industry responds to this dilemma in many ways – the workload builds on existing staff; staff are ‘stolen’ from competitors but the expertise base is not increased; and less qualified people are employed thereby reducing the quality of service to clients and for the business. Anecdotal evidence from industry is that qualified people are leaving the industry due to the work demands being placed upon them, thereby exacerbating the problem.

A consequence of the decline in student numbers is the inevitable decline in the number of providers. The McColl Report in 1991 recommended that there be a consolidation of providers, on the pretext that the resultant providers would be more multidisciplinary and stronger than many of the earlier era. Whilst the rationalisation has occurred and almost all are part of multidisciplinary organisations, the low student numbers have not provided the strength in many campuses that would have been expected. Thus providers of undergraduate agriculture courses have almost halved in number (Figure 12) fulfilling the recommendations of McColl and colleagues. Of greatest concern is the decline by about two-thirds in country campuses offering agriculture. Thus access by rural students to agriculture has become highly limited yet it is rural-based graduate jobs which are the most difficult for employers to fill. Every state capital city except Brisbane currently retains at least one campus where undergraduate agriculture is offered.

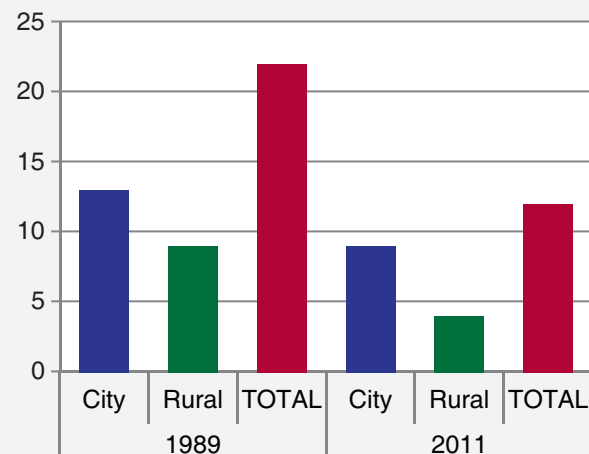


Figure 12: University campuses offering an undergraduate agriculture degree, 1989 and 2011.

By any measure, the agricultural industry faces immense challenges in capacity. Prospective students and their mentors do not see agriculture as a potential career path. Thus students are not entering relevant university courses in sufficient numbers even to maintain the current levels of workforce education. The issue is not that there are no exciting and rewarding careers in agriculture – it is that the emerging workforce generation does not perceive those opportunities in agriculture and is thus attracted to the more positive images portrayed in other employment settings.

If the trend in student enrolments continues we can expect to have further universities dispense with agriculture courses. It is unlikely, once relinquished, that any institution would re-establish such a course. The industry as a whole seems reluctant to embrace education as an essential plank of its future sustainability and seems unwilling to work together to promote both a positive image for the industry and worthwhile careers for prospective participants. The industry as a whole seems to be reluctant to put pressure on the political system to lead the image repositioning and career promotion. There are now sufficient data available to have established that the capacity challenge is real. The challenge will intensify unless there is concerted effort for change.

Acknowledgements

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