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## Finding tomorrow's agricultural workforce

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**Abstract.** The labour shortages which face the Australian agricultural sector could be described as having both acute and chronic aspects. Acute labour shortages can be related to short-term factors; examples include the impacts of extended drought and strong growth within the mining sector which has led to strong competition for labour and a decline in the available labour force. The potential emergence of chronic or long-lasting labour shortages related to a decline in new entrants seeking employment in the sector is a significant issue. While acute labour shortages have been a significant focus for the agricultural industries for many years, agricultural industries now need to invest in strategies to address chronic workforce shortages and emerging skills gaps. Raising awareness among young Australians about the career opportunities within the agricultural sector is seen as an increasingly important strategy. A significant challenge will be how to support these strategies over the long term.

**Key Words:** Agricultural labour, career opportunities, awareness.

### Introduction

Understanding and addressing current and future demands for labour and skills is an ongoing area of interest for those engaged in the agricultural sector. Future employment demand within the Australian food and fibre sector, and the capacity of the sector to compete for employees, will be influenced by a range of factors, including: Government policy, consumer demands, environmental constraints, global competition and the interaction between agriculture and other sectors of the economy. These factors present challenges and opportunities for the sector, as well as uncertainty. This paper will focus on addressing the existing demands for skills and labour, including the substantial replacement demand that is emerging within the sector.

Examples of recent work to understand the demand for skills and labour includes the Australian Farm Institute report (AEC group 2010) examining the current and future human resource requirements of Australian agriculture and the Agrifood Skills Australia (ASA 2011) annual environmental scan of the factors shaping and impacting on the agrifood workforce and how the industry and training systems are responding. Government and industry workforce, skills and training initiatives were also reviewed by the Industries Development Committee Workforce, Skills and Training Working Group in 2009 for their appropriateness. Fundamental to a better understanding of this important issue is a better knowledge of the demand and supply of skills and labour within the sector.

Future demand for skills and labour in the sector is difficult to project and subject to a range of variables. This paper focuses on the replacement of the workforce associated with the Australian agricultural sector, against a

backdrop of continued growth in global demand for food and fibre. Significant growth in global food demand is expected in coming years, with the Food and Agriculture Organization of the United Nations (FAO) estimating that global food production will need to increase 70 per cent by 2050 in order to meet this projected food demand (FAO 2009).

Australian agriculture makes a significant contribution to the Australian economy and the management of Australia's natural resources, and also contributes to domestic and international food security. Farmers occupy and are responsible for the management of 61 per cent of Australia's landmass (DAFF 2010) and in 2009-10 Australian food exports were valued at \$24.3 billion (DAFF 2011). Australian farmers produce almost 93 per cent of Australia's daily domestic food supply and contribute to offsetting global food demand. Australian farmers produce one per cent of the world's food, but are the source for almost three per cent of the food traded globally feeding 40 million people outside Australia (PMSEIC 2010).

Access to appropriate skills and labour is a critical factor in maintaining the productivity, sustainability and profitability of the agricultural sector. The agricultural industries have been involved in dealing with acute labour issues over a considerable time. While immediate labour and skills shortages are an acute issue and make the headlines, it is the issue of an emerging chronic shortage of new entrants and graduates to the sector which potentially presents the most significant challenges.

### Current environment, the acute demands

There are many aspects to the current acute labour shortages faced by the Australian agricultural sector and which relate to both

shortages of both skilled and unskilled labour. Labour force statistics indicate a downturn in employment in 2003 which has continued until 2010 (see Figure 1). This downturn coincided with widespread drought in eastern Australia which reduced employment opportunities, and increased demand and competition for labour from the mining sector. Poor seasons over recent years have also had flow-on impacts for regional economies and communities, which also influences the attractiveness of regional Australia to potential employees.

The recent impact of drought on employment has come on top of long-term trends that have seen consolidation of farms in many agricultural industries and regions. Over the 15-year period to 2001, prior to the recent drought, the number of farming families declined by 31,800 (22 per cent). They may have left the industry for a variety of reasons, including personal (e.g., retirement), economic (e.g., industry restructuring) or environmental (e.g., drought) reasons. Other business related factors such as commodity prices may also play a role in decisions about timing to leave the industry, with lower commodity prices, and hence potentially lower property prices, tending to delay decisions to leave.

Farm employment labour statistics over the past 8 years (see Figure 1) indicate that approximately 80,000 to 100,000 individuals have left the agricultural labour force (ABS 2003). Because of the sustained downturn in employment, it is likely that a number of individuals have permanently left the industry since the early 2000s. It is also likely that farmers have developed efficiencies in their operations or improved farm practices and infrastructure which will have led to some decline in the overall labour requirement of the sector. However, with the widespread rains which occurred in 2010 and the recovery of many water storages there is expected to be an increase in demand for labour in the sector. Agrifood Skills Australia suggests that the recovery in the workforce as industry recovers from drought will be between 10,000 to 20,000 workers each year for the next five years (ASA 2010).

The Australian Council of Deans of Agriculture (2009) has examined the demand for skilled individuals with tertiary qualifications in rural and regional Australia. The ACDA published a study in 2010 examining the job market in agriculture in Australia (Pratley and Hay 2010). It reviewed 50,600 vacancies advertised in the metropolitan and regional print media as well as the internet for a 3-year period from 2007 to 2009. A consistent demand for 15,000 agricultural employees was identified over the study period, with a

ratio of 3:2 for agricultural production related jobs to positions in agribusiness. The ACDA has also published reports and submissions on the gap in graduate numbers. It estimates there may be as much as a six-fold gap between demand and graduate numbers and that graduate numbers are in decline (ACDA 2009). Importantly, the ACDA studies have highlighted that the way jobs were advertised was different between regional and urban Australia, with a particular emphasis on advertisements for agricultural employees in the regional print media. This has implications for the way job data related to agricultural employment is collected and analysed, and the strategies required to understand the employment outlook for the sector.

### **Long-term outlook, a chronic concern**

The agricultural sector is a major contributor to the Australian economy and has important linkages with other sectors of the economy. In 2009, 318,000 people were directly employed on Australian farms (ABS 2009). However, accurate and comprehensive information on future employment prospects and requirements for people in the sector and in its supporting industries is difficult to identify beyond the requirements of replacing the existing workforce. As mentioned earlier in this paper, the workforce demand and the capacity of industry to compete for employees will be influenced by a range of external factors which are difficult to predict.

There will be an increasing requirement for innovation within the agricultural industries globally to address the national and international challenges related to food production. The challenges for agriculture have been articulated by a number of observers. The United Nations issued a call-to-arms for agricultural production to increase 70 per cent by 2050 to meet world population needs in the face of challenges to global food security (FAO 2009). The world population is projected to reach over nine billion by 2050, 34 per cent higher than the current population. Some projections for the Australian population suggest that it may reach 36 million people by 2050. At the same time the Final Report of the Garnaut Review (2008) notes that more than two and half million new jobs will need to be filled over the next two decades in areas either directly or indirectly influenced by the climate change response. The Garnaut Review noted that in addition to jobs in the 'headline' areas of the construction and energy sectors, areas of potential employment change include "transport, agriculture and a range of services in industry subsectors that barely exist today". It seems likely that a number of

these roles will relate to agriculture and the land management sector.

Limited data are available on the demographics of industries and professions within the agricultural sector, but the data available provide a glimpse of the emerging challenges and potential chronic employment issues that the sector is facing. The Labour Supply and Skills Branch in the Research, Analysis and Evaluation Group of Department of Education, Employment and Workplace Relations (DEEWR) has compiled ABS Labour Force Survey statistics for a limited selection of professions within the agricultural sector, which have been published on the Job Outlook website.

Figure 2 shows the age profile of crop; livestock; and mixed crop and livestock farmers published by DEEWR and taken from the 2010 ABS Labour Force Survey. In 2010 the total number of crop, livestock and mixed crop and livestock farmers was 47,700, 105,100 and 42,200 respectively. The demographic data in Figure 2 indicates that there are large numbers of farmers over the age of 65 compared with the average age of the Australian workforce, in some cases more than nine per cent higher than the average, as well as relatively high numbers of farmers in the 45-54 and 55-64 age classes compared with the average workforce. The numbers of farmers in age classes 35-44 and younger are much lower than the Australian average.

The 2009 ABS Agricultural Commodities surveys indicate that there is a total of 135,996 farms in Australia, which includes enterprises for whom farming is not their primary business. Of the total number of enterprises, 120,941 farms are solely dedicated to agricultural production. The 2002 Australian Bureau of Agricultural and Resource Economics Farm Surveys Report indicates that 99 per cent of broadacre and dairy farms were operated by owner-managers in 2001 (ABARE 2008). Broadacre and dairy farms account for 68 per cent of commercial-scale Australian farm businesses (ABS 2009), and these farms are also responsible for the management of more than 90 per cent of the total area of agricultural land in Australia. They account for the majority of Australia's family owned and operated farms. The future of how these farms are owned and managed will have a significant bearing on the future skills and labour required by the Australian agricultural workforce.

The age profile of farm workers in crop, livestock and mixed crop and livestock farms taken from the 2010 ABS Labour Force Survey is shown in Figure 3. The total number of farm workers across crop,

livestock and mixed crop and livestock farms in 2010 were 28,000, 30,200 and 3,400 respectively. The data shown in Figure 3 indicate that a relatively high number of farm workers are from young age classes, particularly the 15-19 and 20-24 age classes, compared to the Australian average. This may reflect the relatively unskilled nature of the work as well as younger family members being employed on family farms, but also the need for temporary labour to meet needs around peak periods such as harvest and seeding.

The data shown in Figures 2 and 3 relate specifically to broadacre agricultural industries. There is a range of other industries including the horticultural, dairy and intensive livestock industries which are not included in these figures. It is likely that there are differences between the age profiles and nature of the workforce in these different industries and the industries will have their own specific challenges. For example, the seasonal nature of work in the horticultural industries creates acute seasonal labour demands which are quite different to those experienced in other industries. The NFF has been working with Government to establish long-term solutions to access labour, including the potential from overseas labour to meet peak labour demands. Sustainable solutions are required to address these labour demands, which may involve better engagement with regional communities and better recognition of the skills and experience which may already exist in these communities.

Access to professional services will present a chronic problem for the agricultural industries in the future. They draw on the skills of a range of science-based professions, veterinarians, chemists, environmental scientists, life scientists and others. *The Employment Outlook for Science Professionals and Veterinarians* produced by DEEWR (2010) (using the ABS Labour Force Survey) indicates that in the decade to 2010 the number of Science Professionals and Veterinarians<sup>12</sup> in Australia rose by 25,800 (36.5 per cent) to 96,300. Agricultural and Forestry Scientists represent 7.5 per cent (7,300) of individuals within this group of professions, which is dominated by medical and environmental scientists.

<sup>12</sup> The Science Professionals and Veterinarians cluster includes Agricultural and Forestry Scientists; Chemists and Food and Wine Scientists; Environmental Scientists; Geologists and Geophysicists; Life Scientists; Medical Laboratory Scientists; Veterinarians; and Other Natural and Physical Science Professionals.

The Employment Outlook for Science Professionals indicates that Agricultural and Veterinary Scientists have the largest share of mature age workers (48.5 per cent of the workforce over the age of 45) within the occupations grouped within the science cluster. Projections by Agrifood Skills Australia in its 2011 Environmental Scan (ASA 2011) suggest that by 2018 half of Australia's agricultural scientists will be nearing retirement.

Within the agricultural science workforce there are specialists in a range of disciplines, for example soil science, plant breeding, taxonomy, entomology and pathology. It is probable that the number of individuals in some disciplines will have grown as the field develops (e.g., areas related to biotechnology) and numbers in others disciplines are likely to have decreased where the research area is considered more mature. For example, the loss of Australia's skills and capacity in soil science and the need to rebuild this capacity in light of the challenges, such as the management of soil carbon, was discussed by Campbell (2008). Some of the Australian agricultural industries have become dependent on the research efforts or technical skills and experience of one or two key individuals, and the loss of these individuals would have a major impact on these industries. For example, the Rice Research and Development Plan developed by Rural Industries Research and Development Corporation (2008) recognised the ageing and depletion of the rice industry's human resource research base and the need to address this as one of the research directions for the industry. The shift in the skills mix within the agricultural science workforce has also created challenges in workforce planning and succession, as new skills and the adoption of information technology is likely to have changed demands and requirements for particular professional skills.

The Department of Education, Employment and Workforce Relations (DEEWR) projects that demand for agricultural and forestry scientists will grow. The projected employment growth for the Agricultural and Forestry Scientists is expected to be 2.7 per cent (1,100) per annum over the next five years (to 2014-15). The issue of graduate numbers and succession in industry and the agribusiness sector have been raised by the National Farmers Federation (NFF) and others in recent times. The Rural Research and Development Council noted this in their National Strategic Rural Research and Development Investment Plan and reported that "With an ageing research workforce and evidence of an increasing skills deficit, there

may already be insufficient capacity in the rural sector to develop and adopt innovations at the desired rate" (Rural Research and Development Council 2011).

The announcement from the Government in June 2011 that it will not alter the funding arrangements for the Rural Research and Development Corporations was welcomed by industry, and is a signal that there will continue to be a demand for skilled researchers in agriculturally relevant areas in Australia. A challenge for the Government and agricultural industries is how to further grow the public and private investment in agricultural research, development and extension, to drive innovation and increase employment in the area.

The global nature of the agricultural research workforce must also be considered. At an informal workshop held in Canberra during mid-2011, an executive from an international research-based agribusiness company indicated that the company was likely to experience a forty to fifty per cent turnover in their 4,000 to 5,000 strong agricultural research workforce over the coming years as a result of retirements. This type of example serves to highlight the global nature of the workforce, and the need to ensure Australia remains competitive in attracting and maintaining its research workforce.

### **Strategies to address labour and skills shortages**

The Australian agricultural industries have been responding to the acute labour and skills shortages, as well as developing strategies to deal with chronic shortages and the long-term skills and labour needs of the sector. A range of strategies is required to attract and retain the labour and skills required by the sector, as well as encouraging new entrants into the industry and to the services which support the industry.

The NFF Labour Shortage Action Plan (NFF 2008) was developed in consultation with regional and sectoral industry bodies as well as government, with a focus on how to support the recovery of the agricultural workforce following the recent drought. Key strategies highlighted to address the gaps in labour and skills that were developed include:

- understanding workforce requirements to better target recruitment;
- publicise and promote the knowledge and technical intensive roles that are emerging in the sector, particularly in schools, to encourage new entrants and graduates;
- develop specific strategies to overcome issues of remoteness and seasonality in different industries to ensure regional

Australia can provide an environment to attract workers;

- improve the promotion of career pathways and in particular encourage education and training to support skills development;
- promote the broader work and lifestyle opportunities that are associated with roles in the agricultural sector; and
- encourage flexibility and simplicity of employment arrangements and regulation to better meet the needs.

The NFF will review its Labour Shortage Action Plan to ensure that agricultural employers will be able to respond as conditions for the agricultural sector recover.

Given that the activities of both the mining industries and the agricultural industries are strongly focused on rural and regional Australia, the NFF has also worked closely with the Minerals Council of Australia to understand regional labour and skills shortages. The Australian Regional Agricultural and Mining Skills (ARAMS) Project (NFF 2009) sought to develop strategies to improve the effectiveness of government programs and the outcomes achieved through training and education programs. The project determined that the issues facing agriculture and mining were not exactly the same. While both industries face a skills shortage, agriculture also faced a general labour shortage. For agriculture this means that two different sets of strategies are required to (a) attract and retain high quality skilled labour and (b) ensure that there is also a ready supply of 'job-ready' labour available, as skilled and general labour involve different people with a range of motivations and circumstances.

The ARAMS project identified three key areas to be addressed in order to improve employment outcomes. The first relates to the need for improved regional infrastructure and services, which are critical factors in encouraging skilled individuals to locate to regional centres. The second relates to the need for appropriate training programs to address labour shortages, with training elements common to both mining and agriculture to allow labour to move between the sectors, but also for flexible training units which could reflect skills required by different regional industries. The third area identified by the ARAMS Project was to address 'fatigue and confusion' among employers related to the provision, availability and accessibility of government education, training and employment programs. Effort was required to ensure that employers were successfully engaged with these programs.

The need to improve the supply of labour, appropriately skilled to meet the

requirements of the agricultural industries, was discussed as part of the 2010 Australian Farm Institute (AEC group 2010) report on current and future human resource needs of Australian agriculture. The report identified the need for more accurate and timely information on labour and skills supply and demand, including recognising changes in seasonal demands for labour. This finding was shared by the 2009 Industries Development Committee Report to the Primary Industries Ministerial Council (PIMC) on workforce, training and skills issues in agriculture. Key findings of the AFI report included:

- the existing standards for classifying occupations (ANZSCO) and industries (ANZSIC) need to be expanded to improve the labour and skills information available for the agricultural and horticultural sectors;
- the data collected on agricultural production, employment and occupational statistics by various reporting organisations need greater consistency and concordance;
- regular and accurate measures of labour and skills shortages in the agricultural sector are required to understand current and future needs, including information on peaks and troughs in the seasonal production cycle; and
- vocational education and training (VET) packages need to be promoted and have the flexibility to deliver the particular skill sets required by sectors to meet seasonal production demands or the needs of individual agriculture/horticulture businesses, industries or regions.

Industrial relations and workforce planning to address acute labour shortages has been a strong interest for the NFF for a number of years. The NFF Labour Shortage Action Plan (NFF 2008) and ARAMS (NFF 2009) clearly identified the need to focus on training (particularly vocational training) to address labour shortages and the need to support regional development as a mechanism to encourage relocation and retention of the workforce. A number of strategies to better address acute labour shortages have emerged from previous work in this area including improved workforce information to understand demand, targeted training, better human resource management and support for regional development.

The NFF has continued to work in the area of vocational training and it is a key area of focus for Rural Skills Australia (RSA) and Agrifood Skills Australia. RSA works in conjunction with the NFF and its member bodies to improve the skills and capacities of

new entrants, existing workers and primary producers alike through Australian Apprenticeships in general agriculture and horticulture, but also across a range of other agricultural areas. Agrifood Skills Australia is responsible for providing advice on workforce development, skills and labour needs in the industry, as well as advice to enterprises on training and workforce needs, advice to government on vocational education policy and the development of appropriate training packages for industry.

The 2009 Report to the Primary Industries Ministerial Council (PIMC) on workforce, training and skills issues in agriculture highlighted the opportunity to improve workforce planning and human resource management skills in the industry in order to attract and retain staff (Industries Development Committee Workforce, Skills and Training Working Group 2009). The opportunity to improve human resource management in the sector has the advantage that it can assist in addressing both acute and chronic labour and skills. Other benefits from improved human resource management in the sector identified include the potential to improve business performance and response to challenges such as changing market and service demands, and managing an ageing farm workforce. The 'fatigue and confusion' among employers identified by the 2009 ARAMS report suggests that to reap the benefits from improved planning and human resource management skills would require targeted investment in effort to support industry to bring about change.

The NFF has had an ongoing interest in regional development and addressing the higher cost of doing business in regional Australia. The NFF's work in this area has focused on aspects including the need to maintain services, such as health care and telecommunications in regional Australia, as well as examining options related to fuel costs and regional tax thresholds which would have broader benefits for business. The development of new technologies associated with the roll-out of broadband in regional Australia may also provide an opportunity to diversify regional economies, provide better access to professional support to those working in regions and improved economic stability to regions, as well as securing ongoing access to services.

Community factors have also been identified as playing a role in attracting and retaining skilled workers in regional Australia. Kilpatrick et al. (2010) identified the important role that communities play in assisting mobile skilled labour to be integrated and retained, and the need for leadership within communities to support this

outcome. The study found that mobile skilled workers were drawn to, wanted to be part of and stay in communities that were innovative, embraced diversity, accepted newcomers, and there was an environment of community confidence and sustainability. The report highlights that communities that were looking to attract, involve and retain skilled newcomers needed to be proactive in developing and managing their resources. This presents an opportunity both to attract and retain skilled labour in regional Australia.

Work has been undertaken within industries to look at mechanisms to facilitate new entrants to farming as well as succession within family farm businesses. The recent guide to succession, developed in collaboration by a number of Rural Research and Development Corporations, "Sustaining Families and Farms" is one example of the different types of support available to facilitate discussion about succession within farm businesses (Wilkinson and Sykes 2007). Anecdotally, reports from within industry indicate that the high value of the assets presents a barrier for new farmers looking to enter the industry, along with access to finance and appropriate support for early career farmers. Some programs have been established to assist new farmers in the industry. Examples of schemes include, the Victorian First Farm Grant Program which provides business planning and development support; the Young Farmers Finance Scheme operated by Rural Finance in Victoria which can assist in stock and equipment purchases, farm leases and land purchases; and the Queensland Government First Start Loan which can assist in farm purchases, leasing and farm establishment. Effective policy and programs to support farm succession and encourage new entrants to farming is an area which continues to be developed and will require further work.

The experience of AgriFood Skills Australia in capturing industry views and evidence for its Annual Environmental Scans is that the problems are complex and need new thinking from industry and government if they are to be addressed (Blewitt, pers. comm. August 2011). Key trends pertaining to the rural workforce include:

- demand for higher skills in labour and skills to address the business challenges and the need for innovation;
- greater reliance on contractors and professional advisors; and
- continued demand for casuals for seasonal work.

Some of the new thinking which will be required by industry to address these challenges include:

- the need for employers to design and name jobs that are attractive and challenging to new employees;
- the need to develop packaged conditions that may include incentives and non-cash benefits in order to compete with other employers, including the mining industry; and
- the need to overcome industry image and perceptions to change stereotypes and better explain the contemporary job, career and lifestyle opportunities within the industry.

### **Attracting young people to careers in agriculture**

The challenge of chronic labour and skills shortages within the agricultural sector will require long-term solutions. A key focus will need to be attracting new entrants to the sector and raising awareness of it within the broader Australian community.

At a fundamental level, concerns have been raised at the level of awareness in the community and among children regarding agriculture and regional Australia. Surveys of school students by the Kondinin Group provide a snapshot of views held by children, and suggest that there has been a widening gap in their knowledge of the industry. A survey undertaken by Kondinin Group in 2002 indicated that only 20 per cent of school children surveyed had visited a farm, down on 88 per cent on a previous survey undertaken by the Group in 1997. The survey also suggested that there was a lack of understanding about farm operations and the technological intensity of farming. Strong stereotypes of farmers were reported to exist among the children surveyed. The Australian Council of Educational Research is currently undertaking a national survey of students and teachers to better understand the levels of awareness of agriculture which exist. The results of this work, which has been supported by the Primary Industries Education Foundation (PIEF), are expected to be available in late 2011.

The NFF sees initiatives focused on improving awareness of the agricultural sector as being extremely important both in addressing the emerging capability gaps and attracting employees to the sector, but also ensuring that the broader community is better positioned to understand and engage in public debate related to agriculture. A number of initiatives have been developed with a view to both increasing awareness and interest in agriculture among young people, teachers and parents and attracting individuals to take part in agriculture-related studies, or consider careers in agriculture.

Over an extended period of time, the NFF has observed the development of a number of programs that aim to attract and develop the agricultural workforce. However, many stakeholders have focused on addressing the issue on a sector-by-sector basis or on a single program basis with little interaction with other groups or existing programs. What is becoming apparent is that a 'whole of landscape' approach is needed to make an impact and to seek opportunities for greater efficiencies and collaboration on work in this area.

Figure 4 is a schematic diagram which illustrates a range of initiatives in place and how they engage with primary, secondary, and tertiary (undergraduate and postgraduate) education, as well as workforce (vocational) training and engagement with the broader community. The schemes listed in Figure 4 are extensive, but not exhaustive and a range of other programs exist outside those listed. Three cross-sector programs that are aimed at these early years of education are described below, they include PIEF, the Primary Industries Centre for Science Education (PICSE) and the Investing in Youth Program. Each has a particular focus that differentiates it, and together the programs provide a consistent suite of support for agricultural education and improved awareness of the agricultural sector from primary through to secondary and tertiary education.

Evidence to support the need to engage early in the education system to shape future education and career choices is increasing. The Australian Council for Educational Research (ACER) released survey findings that indicate that 40 per cent of first year students first considered university study while in primary school (ACER 2010). This sort of study illustrates that decisions about future directions and studies are made relatively early in life and that there is value of engaging in education early in school curriculums, before students have formed clear views on their career path. The experience of NFF, in engaging with schools-based programs, has highlighted that it is vital to engage with professionals in the primary and secondary school system to ensure programs are relevant to the curriculum and that they meet teacher and student demands.

The PIEF is responsible for aggregating existing educational resources and developing relevant materials for school years from Kindergarten to Year 12 which are aimed across the entire school curriculum. The primary industries will be used as a context for the development of learning materials across a range of subjects. The



PIEF has been established in recognition of the interest that many teachers (primary and secondary) have in teaching their students about food and fibre production, and to address the need for credible, authoritative and user-ready resources to be used in teaching. Ultimately PIEF can assist in developing community awareness and understanding about food and fibre production, but also encourage people to work in sectors related to the primary industries. The PIEF has been established as the peak body for primary industries education in Australian schools through collaboration between the agricultural industries, education and government sectors. For PIEF to develop a suite of diverse curriculum materials is a long-term exercise that may take up to 10 years at a cost in the order of \$15 million. It will be important to ensure that there is a long-term commitment and that these materials can be updated and expanded over time.

The Primary Industries Centre for Science Education (PICSE) is a national program to attract students into tertiary science and to increase the number of skilled professionals in agribusiness and research institutions. The focus of the program has been the development of science curriculum materials for Years 10 through to 12 and support for teachers and students with agriculture-relevant science studies. The program has grown from pilot projects which began in 1998 and has the support of universities, government, industries as well as agribusiness companies. The PICSE program complements the work of PIEF, as it has a particular focus on the science curriculum in secondary school. It focuses on several key issues including developing student interest in specific careers that meet their personal interests and aspirations, and taking action to enrol in specific tertiary courses that lead to those career options. A strength of the PICSE program is the level of engagement it has with agribusiness companies that participate in work experience placements.

Some support exists for undergraduates moving from secondary school to university education, through the PICSE program and the support network of students who have been through that program, but also through the Investing in Youth program coordinated by RIRDC. It began with a pilot in 2010 and is now in its second year of operation. Undergraduate students are provided with financial support matched with a career mentor and assisted with relevant industry placements while they undertake their degree. At present the number of scholarships offered under this program is limited to approximately ten places each

year, but there may be opportunities to grow these numbers and better integrate the studentships with the PICSE program in the future.

The aims and activities of the programs described are complementary – and investment is needed across the scope of their activities to make a significant impact in addressing future labour and skills needs, and collaborative and linked approaches are needed to ensure that gains made through one program can add value to others.

While these programs are designed to bring primary industries into the formal education system they also provide significant opportunities to raise the profile of agriculture in the broader community. However, these programs are all exposed to funding risks. Funding programs linked with Government and especially through the Rural Research and Development Corporations generally have durations of up to three years, which puts the programs at risk of termination before their value can be realised. For example, the 'Primary Connections' and 'Science By Doing' programs run by the Australian Academy of Sciences were subject to budget cuts in the 2011-12 Federal budget. These began in 2003 and were established to support professional development for science teachers to effectively engage primary and secondary school students on science curriculum. The cuts came despite positive evaluations of the program. For example, within five years of its introduction the Primary Connections resource was being taught in 76 per cent of Australia's primary schools. While programs such as PIEF, PICSE and Investing in Youth obtain significant portions of their funding through short-term arrangements there is a significant risk that these programs will remain at the mercy of short-term funding decisions.

### **International experiences with skills and labour shortages**

The challenge associated with identifying and recruiting an agricultural workforce is not restricted to Australia. Many of the issues and strategies associated with addressing acute and chronic workforce issues are shared with other countries. The size of agricultural industries and their workforces vary between countries, and the ability of the industry to compete for employees is also influenced by the economic and policy conditions within the country.

The Strategy for New Zealand Dairy Farming produced by DairyNZ, Dairy Companies Association of New Zealand and New Zealand Federated Farmers (2009) identifies "Talented and skilled people are attracted to,

and retained by, the industry" as a key outcome. The New Zealand dairy industry has seen a positive trend in the growth of the industry and significant changes in ownership structures. As a consequence demands have increased for labour on-farm and in supporting industries. Employees in the dairy industry also need increased skill levels to deal with the increased complexity, diversity and volatility of the industry. In order to achieve this outcome the industry has sought to:

- attract talented people (including: the promotion of careers to school leavers, tertiary students and early career change individuals; improve communication about opportunities in the industry; and influence government on legislation relating to immigrant workers);
- develop a quality work environment (including: improve the skills of industry as employers and human resource managers; and focus on innovation and improved productivity in the industry); and
- develop dairy people's careers (including: improved training to meet skill requirements; developing leadership in industry; and the development of mentoring and coaching programmes to support people developing careers in the industry).

The Canadian Agriculture Human Resource Council has examined the human resource issues of the Canadian agricultural industries and worked to develop solutions to these challenges. Their work has included understanding the skills and development needs of the industry (CAHRC 2011) as well as a broader analysis of the trends likely to influence the skills of the agricultural industries in Canada (CAHRC 2010). Their work indicates that, as in Australia, the average age of farmers in Canada is increasing, and there has been a consolidation of farm enterprises (CAHRC 2010). Key areas identified by industry (CAHRC 2011) where work is required to improve human resource outcomes for the industry included:

- the need to engage with youth to promote and advocate career opportunities within the industry;
- the need for training that is relevant to the increasing sophistication of industry as well as meeting the needs of students and the development of leadership skills;
- improved apprenticeship programs to deliver training and support young people entering the industry;
- the need for industry to be better at self promoting and improving the profile of the industry within Canada;

- increased immigration to improve the labour pool; and
- improved communication between agricultural industries and other sectors on experiences and best practices to attract and retain staff within the sector.

The experiences from New Zealand and Canada indicate that trends influencing employment in Australian agriculture are shared in other countries. These trends include consolidation within the agricultural industries, volatility in the sector, but also the reducing visibility of the sector as an employer. The challenges of attracting employees to agricultural careers, the need to improve human resource management within the industry and develop appropriate skills in the workforce are also shared by agricultural industries, and there are opportunities for Australia to learn from these international experiences.

### Conclusions

The skills and labour shortages which face the Australian agricultural sector have acute and chronic elements. In recent years acute labour shortages have been influenced by the impacts of extended drought, strong growth within the mining sector, but also seasonal aspects related to agricultural production systems. The emergence of a chronic shortage of skills and labour is a significant concern for the industry and strategies to address these shortages need long-term support.

To better understand both acute and chronic labour demand and supply issues, it is important that better data are collected on the scope of skills and the labour required, including both demand and supply elements. This information would help to understand the complexities of industries' requirements, which range from changes in the seasonal workforce requirements, to chronic issues associated with skills and labour supply. The challenges associated with workforce planning span a large number of the roles that exist in the agricultural sector.

The skills of employers in the agricultural industries must also be improved to ensure that industry has the workforce planning and human resource management skills to identify, attract and retain staff. Regional and community approaches must also be considered when attracting skills and labour to rural Australia to both promote the opportunities and assist in the retention of the regional workforce.

Limited surveys and anecdotal evidence indicate that there has been a decline in the visibility of the agricultural industries, particularly among urban Australia. A challenge for industry is to improve the

profile of the sector and awareness of the opportunities that it provides. Engaging in the education system through school-based programs provides a mechanism to encourage young Australians to consider a career in agriculture, and also to improve the awareness and understanding in the broader Australian community of agricultural and rural issues. It is important that there is a long-term commitment to school-based programs to ensure they bear fruit.

The skills and labour issues faced by the agricultural industries in Australia may have particular characteristics which are unique to Australia, but many of the issues are being experienced in other countries and there are opportunities to learn and benefit from international experiences in this area.

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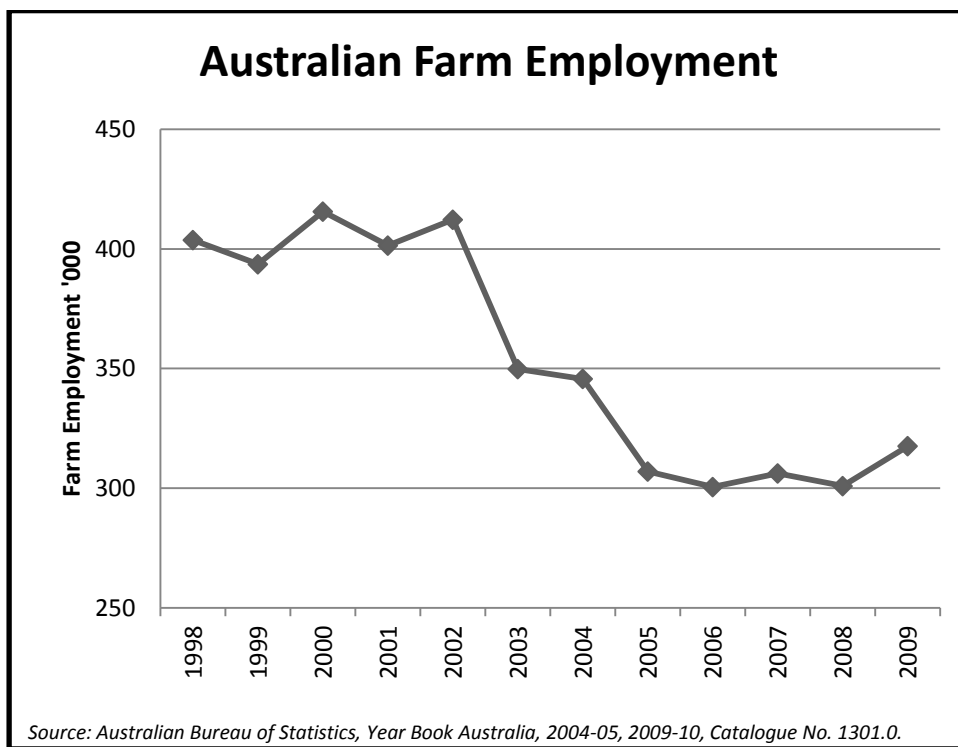
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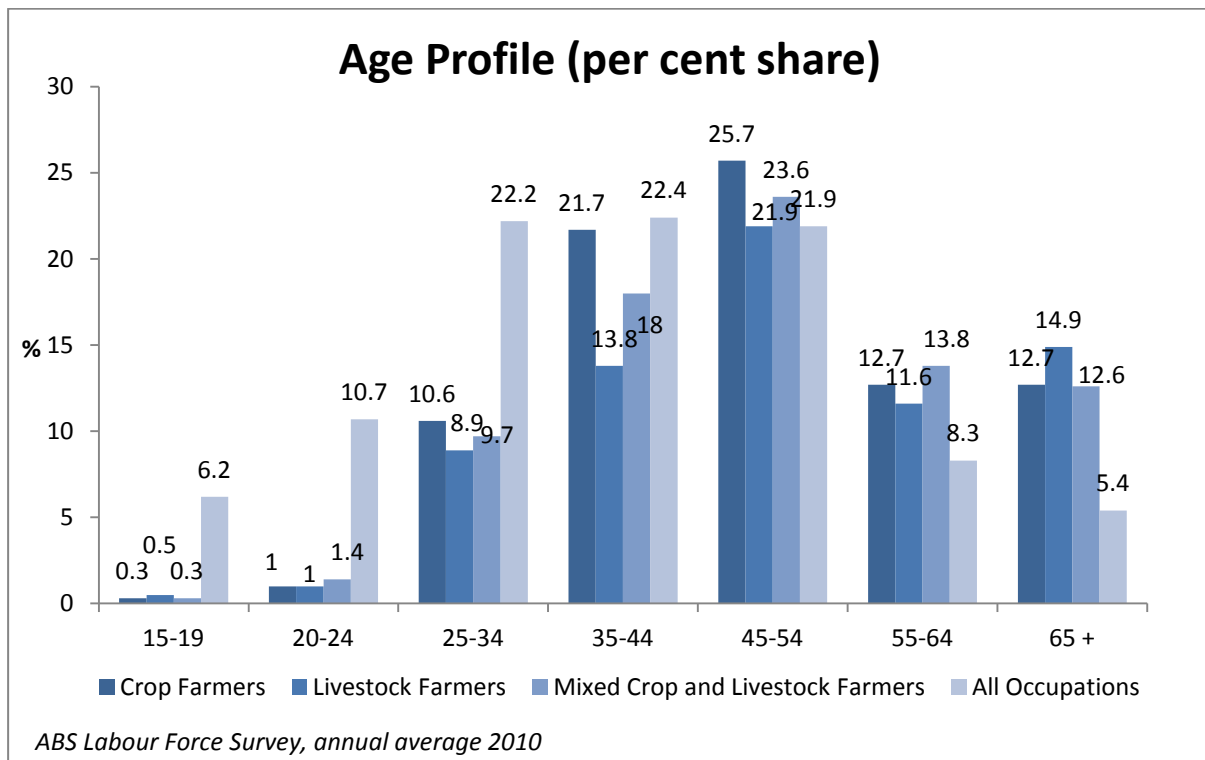
## Appendix

Figure 1. Australian farm employment



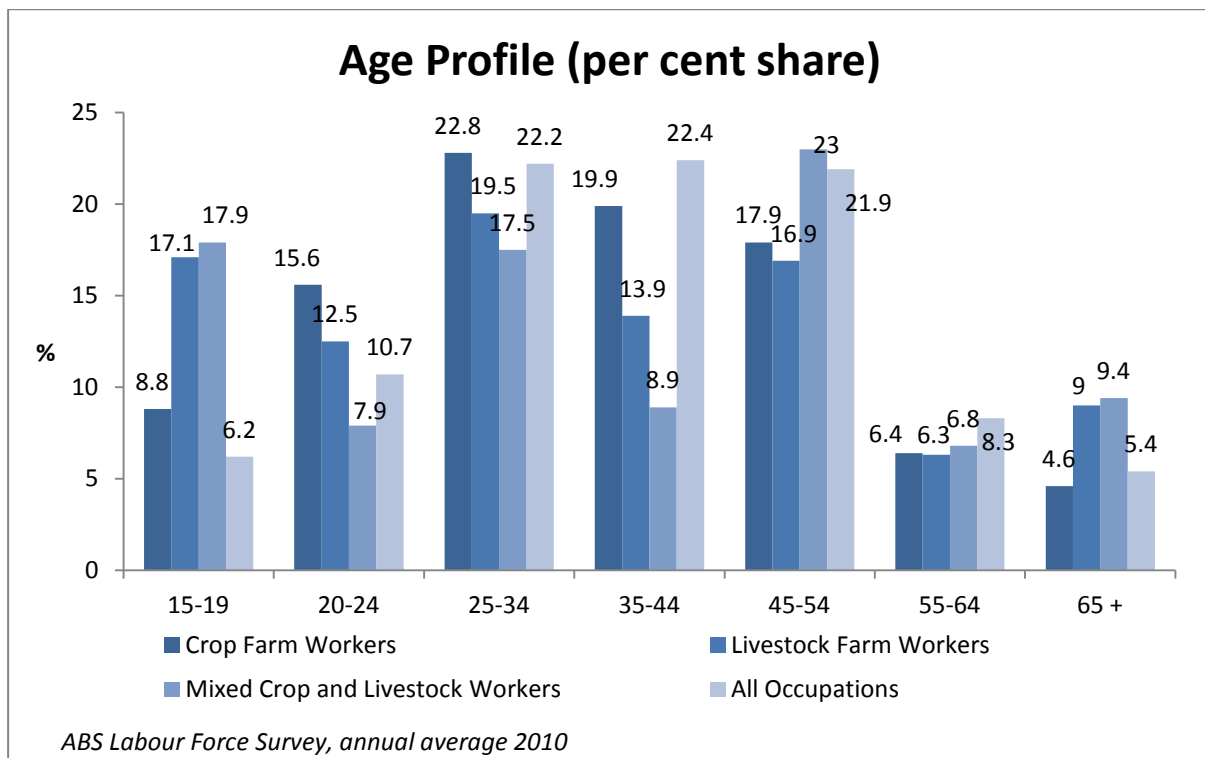
Source: ABS, Year Book Australia, 2004-05, 2009-10, Catalogue No 1301.0.

Figure 2. The age profile of crop; livestock; and mixed crop & livestock farmers and the Australian average age profile taken from the 2010 ABS Labour Force Survey



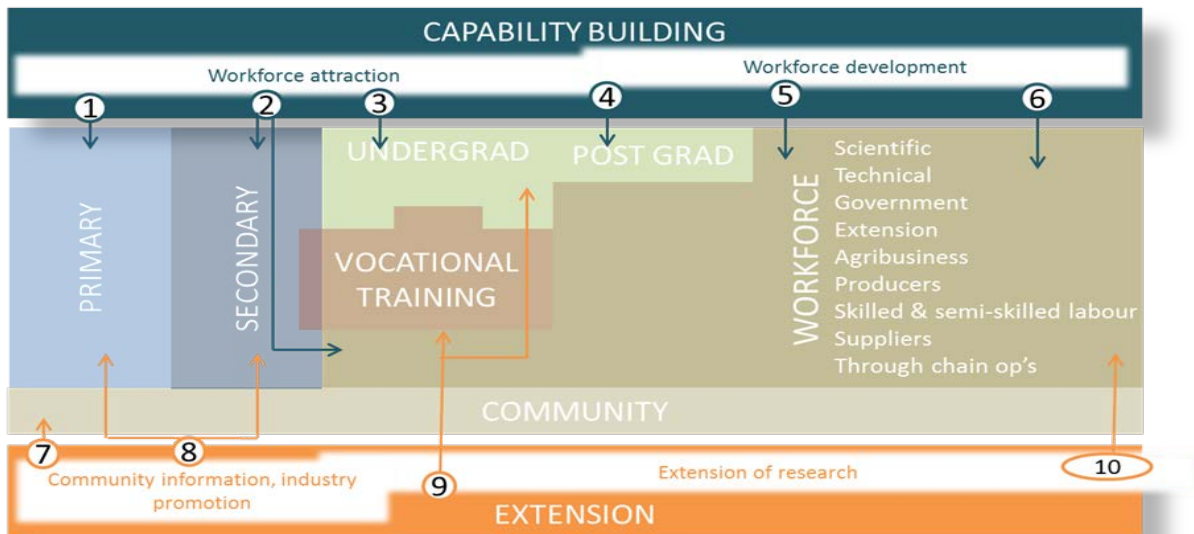
Source: ABS, Labour Force Survey, annual average 2010.

Figure 3. The 2010 age profile of crop farm workers, livestock farm workers and mixed crop & livestock farm workers and the Australian average age profile taken from the ABS Labour Force Survey



Source: ABS, Labour Force Survey, annual average 2010.

Figure 4. Graphic illustration of programs supporting the attraction and development of skilled labour in the agricultural industries



1. PIEF
2. PICSE, PIEF, Skills One, CAA, Alife, RSA, Industry specific e.g. Dairy Youth Australia
3. PICSE, Investing in Youth undergraduate scholarships
4. Post-graduate scholarships
5. Business skills, Technical skills development, Agrifood skills Australia, Nuffield, bursaries, tours
6. Industry leadership programs, ARLP, Trail Blazers, Mentoring
7. PIEF, Community and consumer information, industry promotion
8. PIEF, curriculum resource development
9. Curriculum resource development, research publications
10. Research publications, fact sheets, extension activities, conferences, websites