



FINAL REPORT 2017

For Public Release

Part 1 - Summary Details

Please use your TAB key to complete Parts 1 & 2.

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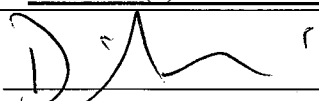
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Part 3 – Final Report

Background

1. Outline the background to the project.

A major aim of the Australian Cotton industry is to maintain its position as global leader in cotton quality and yield through sustained improvements in productivity and profitability in all areas of operation, while equipping the industry to handle emerging challenges. Critical to achieving this aim is the development of human capital that is capable and connected, and with the knowledge and skills necessary to drive the industry. In this respect, the industry has focused on building a skilled, educated and progressive workforce in all areas of its operations, requiring attention to workforce planning and management in all areas of cotton production.

It is recognised that while the processes involved in planning and managing workforce are similar across industries, they tend to be more complex for farmers, especially where farmers grow a mix of crops with or without livestock and undertake other farm-related operations. Workforce management on farms involves planning for and obtaining the variety of skills necessary to handle the diverse operations, taking into account the seasonal nature of work, cyclical variations in output emanating from climatic conditions and availability of water, changing skill requirements from continuous automation of operations, and competing demand for the needed skills from other industries.

In pursuit of the objective of building a skilled, educated and progressive workforce and taking into account the challenges that farmers face in sourcing and managing their workforce, this project investigated current and future trends in workforce needs and supply of labour on cotton farms. Specifically, it examined farmers' perceptions of future labour needs, the skills required to meet these needs, adequacy and sources of skills supply to meet current and future needs, management of skills on farms, and strategies used to retain good performing employees. The objectives and associated milestones and performance indicators addressed in the project are detailed in the next section.

Objectives

2. List the project objectives and the extent to which these have been achieved, with reference to the Milestones and Performance indicators.

1. The first set of objectives were to: develop an inventory of labour needs on cotton farms by terms of employment and positions, identify recruitment sources for the positions, and examine retention strategies to maintain core staff. The milestones for this objective involved: i) charting and describing the cotton production cycle from secondary sources and reviewing the literature on workforce in the agricultural sector; and ii) ascertaining labour requirements on cotton farms, recruitment sources and processes, and retention strategies used by cotton farmers.

These milestones required: a) developing semi-structured questions for interviews; b) carrying out interviews with farmers; iii) analysing the data and writing the first and second reports. The following outputs, presented in the May and November 2015 and the May 2016 reports to the CRDC, met the performance indicators for the objectives and milestones:

- a) *A review of the literature on workforce profile, and approaches to employee management in the agricultural sector;*
- b) *A description of the cotton production and ginning cycle;*
- c) *Major themes from interviews with farmers organised in a matrix structure identifying skills required for various farm operations, their recruitment sources and selection processes, training, development, remuneration and retention strategies, farmers' views on*

current farm technology and perceptions of future technology, anticipated activities from emerging technology and the skills to meet these activities; and

- d) *The semi-structured interview questions used to collect data*
2. The second set of objectives were to: ascertain the range of labour supply sources for the rural sector and the cotton industry specifically, identify sources and types of labour supplied and ascertain how they are matched with demands on farms. The second set of objectives also involved determining how contractors and temporary workers manage work opportunities over the year to maximise their incomes. The milestones for these objectives were to: i) identify and interview labour supply sources; ii) identify and interview contractors; iii) analyse interview data and write a report. The following outputs were provided to meet the performance indicators for these milestones in the November 2016 and May 2017 reports:
 - a) *Semi-structured questions used for the interview with labour supply firms and contractors;*
 - b) *Information from interviews with organisations supplying labour to the agricultural sector in general and the cotton industry specifically, organised thematically in a matrix structure. Issues covered were: types of labour supplied, sources of recruitment, training provided, scope of activities and services provided (labour hire versus labour supply), areas of skills shortages and strategies to address them, perceived current and future impact of changing technology on labour needs and supply to the industry, and the role of educational institutions in addressing the skills in shortfall.*
 - c) *Information from interview with contractors servicing the cotton industry, also organised thematically (by themes) addressing similar issues as covered for farmers*
 - d) *Major themes extracted from interviews with experts from the agricultural industry generally and cotton specifically. The experts included consultants, irrigators and industry body representatives. The issues explored were their perspectives on skill requirements, supply sources, areas of shortage, impact of emerging technology on farms and ability of educational institution to meet identified skills gap.*
 3. The third objective required matching labour requirements from the first set of objectives with labour available from sources in the second set of objectives to identify gaps and recommend strategies to address them. This objective was achieved by analysing the reports for objectives 1 and 2 to identify gaps in supply of labour to meet requirements.

Gaps in the supply of skills to cotton farmers to meet their requirements were identified and remedial actions suggested in the May 2017 report, meeting the performance indicator for the objective and associated milestone.

4. The fourth objective involved developing a skills profile with job descriptions and specifications for positions on cotton farms. The milestone and performance indicators for this objective were to prepare and present job descriptions and specifications for positions on cotton farms.

Three positions were identified for cotton farms which were also relevant to contracting firms that service cotton farmers. These were: farm hand, farm supervisor or lead hand, and farm manager. Positions descriptions (PDs) were prepared for each position and their contents are summarised in section 4 of this report.

5. The fifth objective was to assess employee retention strategies used by cotton farmers against practices in other agricultural industries in order to identify gaps and recommend remedial actions where necessary. The milestone associated with this objective was to analyse interview data for objective 1 for retention strategies used by farmers and assess them against best practices in other agricultural industries.

The performance indicator for this objective and associated milestone were covered in the November 2015 and May 2016 reports to the CRDC both of which include a section on retention strategies on cotton farms.

Methods

3. Detail the methodology and justify the methodology used. Include any discoveries in methods that may benefit other related research.

A qualitative research approach was employed as proposed in the project application. Secondary sources of information were used to provide an overview of the workforce and approaches to employee management in the agricultural sector, and to describe the processes associated with cotton production and ginning. The aim was to present an overview of the context within which labour demand and supply were to be examined and gain an understanding of the jobs involved at each stage of the production process for which labour was required.

Data for the rest of the project involved interviews with various groups of people associated with cotton farms. The process started with telephone interviews with eleven cotton and agricultural experts in various locations across eastern Australia, identified through snowballing. Information from this first set of interviews provided a broad perspective on trends in labour demand and supply and was used to update the semi-structured interview questions developed for the interviews with cotton farmers and labour supply sources.

The next set of interviews were carried out face-to-face with cotton farmers in three contrasting and representative cotton growing regions – Balonne, the Riverina and the Gwydir. They were selected with assistance from Cotton Australia regional managers. Fifteen cotton growers in the Riverina and eight in Balonne were interviewed. Another six from Balonne, not available for the face-to-face interviews, were interviewed by telephone as were three from Gwydir, especially Moree. Labour requirements, sources and management were similar across the three regions despite differences in water supply, weather patterns and timing of the various stages of production. In total thirty-two farmers were interviewed.

The interviews with cotton farmers confirmed that many were reliant on contractors to carry out work at various stages of the production process, especially planting, irrigating and harvesting. Contractors were integral to the production process and their labour needs and supply sources were essential to an overall understanding of trends in these areas on cotton farms. Contractors employed workers for similar positions and from the same sources as farmers. Twenty-three contractors were interviewed for this segment of the project. They were identified from a list on the Cotton Australia website. Interviewees were limited to those who agreed to participate in the study. Given that many contractors were highly mobile and available over short periods of time, telephone rather than face-to-face interview was the most feasible method of collecting data from them.

The fourth and last set of interviews were with labour supply firms. The population of labour supply firms to the agricultural industry in general was small with about three servicing the cotton industry specifically. They were widely spread across eastern and western Australia. Thirty-five labour supply organisations were identified from the internet, using various search terms. Of these fourteen were job boards for backpackers and other job seekers with no contact details. The officials contacted in eleven of the remaining organisations either did not return the calls or were not keen to participate in the project. Overall, ten officials from a variety of organisations supplying labour to the agricultural sector generally or cotton specifically were interviewed.

Data collection was approved by the University of New England with Ethics number HE15-135. The interviews were recorded and transcribed with permission from interviewees, and the transcripts analysed for major themes which were organised in matrix structures in spreadsheets. In the application for this project it was proposed that NVivo and MAXQ would be used to analyse the data. Nevertheless, data was manually analysed for simplicity and due to time constraints. The proposed analytical tools will be used when analysing the data for articles to be published in journals. The results for the various objectives are summarised next.

Results

4. Detail and discuss the results for each objective including the statistical analysis of results.

The main findings from the interviews as covered in the reports are summarised below.

May 2015 Report

Profile of Agriculture Workforce in General and Cotton Specifically

Drawing from the Australian Bureau of Statistics (ABS) and other publications, the May 2015 report to the CRDC noted a declining trend in the agricultural workforce, which is expected to continue in the distant future. The trend was attributed to factors such as mechanisation of farming, amalgamation of farms, competition from other industries, lack of water, poor climatic conditions, ageing of the rural population, and migration of young skilled workers to the big cities. Managers and labourers comprised the main occupation types in the sector, and the majority (60%) of managers were either owners of small- to medium-sized farms or related to the owners. The sector was highly reliant on backpackers for the seasonal and labouring work. Professionals and technical and trade workers were few as skilled work was often contracted out rather than undertaken in-house.

The educational level of farm workers was lower than the average Australian and many did not have tertiary qualifications, preferring to acquire knowledge through traditional sources such as on-the-job, at field days, or passed on from one generation to another on family farms rather than through formal education. Wages were low in the industry due to low levels of education, added to the large number of casual or part-time employees, under-remunerated family members, and non-monetary provisions such as accommodation, private use of farm vehicles, and/or mobile phones.

A different profile from the above emerged when the lens were narrowed to focus on the cotton industry specifically. Employees and employers were younger and more knowledgeable than the average farm worker, a result of the proactive measures undertaken by the industry bodies to keep employers and their employees informed on all issues affecting cotton production. Some of these measures were listed in the May 2015 and included the *myBMP* program that educates farmers on effective workforce management; work, health and safety issues; and the legal obligations of farmers as employers. The industry also assists with development of employees by providing various training programs and scholarships to upgrade employees' skills and qualifications.

Despite the above deviations from the norm, the study noted that the majority of employees in cotton outside the family structure were farm hands (labourers) with limited formal education and employed on casual contracts, restricting their prospects of climbing up the ranks. This created a gap at the next level - the supervisory or lead farm hand position that required in-depth knowledge of the operations and maintenance of various equipment, soil and plant performance and managerial skills. It was also expected that new and computerised technology would increase the skills required on farms while creating opportunities for self-employed professionals in emerging areas such as processing and interpreting on-farm data to help farmers make decisions on their operations.

November 2015 and May 2016 Reports

Cotton Farmers' Current and Future Labour Needs

The farmer interviewees comprised owners of 3 micro-sized farms with up to 4 full-time equivalent (FTE) workers, 19 farmers with 5 to 19 FTE equivalent workers, and 10 medium-sized farm owners with up to 199 (FTEs). One of the large medium-sized farms was family owned and two were listed on the Australian Stock Exchange with international shareholders. Over 90% of the interviewees were engaged in mixed farming, growing cotton with other crops and/or livestock, and/or involved in off-farm activities such as contracting to other farmers, cartage, gin operation, or manufacturing farm equipment.

Three main positions were identified – farm hands; lead farm hands (supervisors) and farm managers. Details of recruitment, selection, training, and remuneration of the three farm positions were provided in the November 2015 and May 2016 reports to the CRDC. Position descriptions were also provided for each position covering reporting relationships; position summary; major responsibilities and duties; skills and experiences (personal specifications) including qualifications, number of years' experience, and competency areas appropriate to each position. Contractors were used extensively for various farm processes, to help manage the peaks and lows in the production cycle, reduce labour costs and avoid investing in expensive machinery. Contracting also provided the flexibility required to respond to changing environmental conditions. Contractors servicing the cotton industry were interviewed for their labour needs and supply sources. The findings were discussed in the November 2016 report to the CRDC and summarised below.

Changing Technology and Implications for Labour Needs

Immediate past technological advances in the industry were identified by farmers as associated with new cotton breeds, enabling efficient pest management, and improvements in water use and yield; round bale pickers that pick, process and pack cotton; bank-less irrigation systems reducing water use; auto-steering tractors that reduce employee training time but also increase monotony, repair time and costs, and the risk of accidents; remote sensing technology and drones enabling remote access to and operation of farm equipment and systems, and data collection for monitoring. All of these technologies had significantly reduced labour needs, although efficiencies achieved in terms of cost reduction were unclear. Cotton farmers were of the view that the new technologies transferred costs from labour to capital. Farmers mentioned driverless machines, infra-red sensors to investigate plant and leaf moisture, electro-magnetic and satellite surveys for soil performance and water efficiency, as emerging areas of technological development on farms. Nonetheless, they felt that the accompanying changes would have less impact on operations than changes in the last century. Even so, the majority saw themselves as late adopters and laggards, expecting to continue operating as they currently do in the short-term (next five years). Despite the slow adoption rate, farmers felt they would require employees with enhanced computer skills and that their current good employees would need training to improve their computer skills. Some of the older farmers acknowledged that their computer skills were lacking when compared with those of their young employees and also that it may be difficult to train older more traditional oriented employees to acquire the skills and knowledge required to operate computerised equipment. Currently, the required knowledge is provided by equipment suppliers and also sourced from the manuals accompanying equipment purchased.

An important resource identified as emerging but underutilised on farms was 'big data' collected by new equipment and covering all aspects of farm operations including yields, soil moisture and performance, fertiliser applications, weather, and machinery performance. The data needed to be analysed, interpreted and used to support decisions. Analysis and use of data for decision-making were rarely undertaken by farmers, hindered by issues with data access, storage, ownership, security and volume as well as lack of the skills required to collate them over time, and analyse and interpret them. A gap therefore exists in advisory capacity to help farmers extract meaning

from the data collected. There is opportunity for agricultural consultants to develop algorithms (computer software) that can assemble the flood of big data on farms and analyse them to appraise current farm performance and recommend changes to practice that might improve profits.

Retention of Employees on Farms

Cotton farmers were described by labour supply firms, contractors and others in the industry as ahead of farmers in other agricultural industries with respect to efforts to retain employees. Incentives provided to reduce turnover or poaching of core staff included paying competitive wages; providing accommodation, vehicles, mobile phone, flexible work arrangements; paying the school fees of employees' children; paying for employees to attend various training and development programs; and in rare situations providing employee share schemes. A number of external factors, however, detracted from farmers' efforts at retaining core employees. These were: fluctuating output caused by climatic conditions, water availability, and government policies on water; competition from other industries, notably mining; lack of employment opportunities for spouses; and isolation and lack of amenities in the remote locations of the farms. The November 2016 report examined how the factors discussed above apply to contractors and the findings are reported next.

Despite the positive overall picture from the interviews, there were references to paying wages below the award rate, providing poor accommodation and treating employees poorly. Some interviewees noted that it was better to allow employees to leave than exert energy to retain them since more often than not the relationship ultimately breaks down. To maintain a consistent overall image of the industry in this area, the industry bodies must take steps to audit working conditions on cotton farms from time to time. It appeared some of this was carried out by the Regional Development Officers who worked closely with farmers on various areas of their farm operations and management. Nonetheless, the extent of audit of cotton farms to ensure working conditions are appropriate and relevant legislation are complied with falls short of standards in other industries such as Dairy.

November 2016 Report

Contractors and their Labour Needs and Recruitment Sources

The corporate and medium-sized farms pursuing efficient and flexible operations as well as small farms which could not afford to buy new equipment, used contractors extensively for various on-farm operations such as harvesting, mulching and preparing beds for planting, spraying, irrigation, and agronomy services. Contractors were therefore an integral component of the labour force on cotton farms.

A variety of business models were represented among the contractors interviewed. Some farmers who invested in new machinery contracted their services to help recoup the cost of the machinery or to supplement income from farming. Many of these farmer-contractors were territorial, working on the next one or few farms or up to 100 km radius from their base location. They were a threat to the 'pure contractors' because they competed for jobs at reduced rates, lowering margins in the industry and driving out pure contractors unable to secure enough work to recoup the cost of their equipment. Some of the pure contractors specialised in medium to large cotton farms such as Cubbie and Twynam, while others accepted work on farms of all sizes. A few travelling contractors started from Emerald and worked their way down to Griffith and Hillston. Differences in start of the seasons across the various locations assured travelling contractors of work from one location to another although they had to compete with local contractors. In addition to location, pure contractors provided services for a variety of crops so that they had business all year-round.

The different business models had implications for workforce planning and management in areas such as recruitment, the length of casual contracts, tasks assigned to employees, retention and sustenance allowances to employees. The labour needs and sources of recruitment for

contractors were similar to those of cotton farmers except that employees were mainly at the farm hand position with a few lead hands or supervisors and rarely any farm managers. Furthermore, employees were mobile for pure contractors who travelled long distances with their workforce to provide services to clients.

Training and Development of Employees by Contractors

An important issue covered in the November 2016 report was employee training (induction, ongoing and Work, Health & Safety (WH&S)) by contractors. Provision of induction training was common, although there were significant variations with respect to breadth of issues covered and depth of coverage. Backpackers and other casual employees were recruited 2-4 weeks ahead of the season to allow time to train them on how to use and service the various machines. Ongoing training was generally on-the-job and focused on operation and maintenance of equipment. Contractors were willing to invest in external training for employees to obtain the certificates and licences they required to perform on-the-job. However, investment in formal training for qualifications and development was rare for non-family employees. The deterrents to investing in employee training included reduced returns when employees leave; the large number of casuals or employees on temporary contracts; employers found more value in practical, hands-on training on the farm than knowledge acquisition from educational institutions; and lack of opportunities for core staff to advance through the ranks on small to medium family farms, limiting the relevance of training for career advancement, except for family members. These factors were also voiced by farmers as barriers to employee development.

The majority of contractors followed the training program prescribed in *myBMP* for WH&S, covering issues such as occupational health and safety procedures on the machines, break down and risk assessments of machines, emergency procedures, first aid contacts, backpacker language skills in case of emergency, handling dangerous chemicals, and using appropriate clothing such as helmets and spraying gear. Employees were required to sign off after training as part of the risk management process.

The May 2015 to November 2016 reports noted that farmers and contractors recruited from various sources including word of mouth, friends and relatives, advertisement in the rural newspapers, student exchange programs, internet (Facebook, Twitter and other social media sites), backpacker hostels, and through employment agencies. Employment agencies as a source of labour supply to cotton farmers were therefore studied to assess their ability to meet the workforce needs of farmers in numbers and quality of employees. The findings were presented in the May 2017 report and summarised below.

May 2017

Labour Supply – Employment Agencies and other Supply Sources

Diverse organisations supplied employees to the agricultural sector; some specialising in specific sectors such as horticulture or cotton, or employees from specific countries such as New Zealand, the ASEAN countries, India or South Pacific. Other labour supply firms were large subsidiaries of international corporations that recruited either exclusively for the Australian agricultural sector or with other sectors such as construction and manufacturing. Also included in the labour supply sources were regional migration agents who processed applications for prospective migrants to regional areas or farmers seeking employees for positions on their farms. The majority of suppliers operated in the private sector, although the seasonal worker program and other agricultural employment programs were operated by government bodies such as Jobs Australia. There were also not-for-profit or volunteer programs and job boards that linked backpackers to potential employers, or farmers with volunteers to help address short-term emergencies on-farms.

Some suppliers provided labour hire services while others restricted their services to recruiting employees for farmers and contractors. Both types of labour supply firms maintained databases of potential employees to which they added from time to time. Candidates from the databases were then matched with clients' (employers') requirements or position descriptions. The labour supply firms were also responsible for ensuring that employees were placed on farms with good working conditions (including amenities and remunerations) and therefore they carried out audits of working conditions on the farms of their clients.

In addition to recruiting, labour hire firms as opposed to the pure recruitment firms, provided induction training; were responsible for paying wages (usually at award rates) with superannuation and associated costs such as workers' compensation and payroll tax; and handled accidents involving the employees placed. Farmers who used labour hire firms gained by avoiding expensive payroll tax, insurance and administrative costs, enabling them to focus on managing employee performance. The recruitment, selection and other processes used by the labour supply firms to match employees with employers were detailed in the May 2017 report to the CRDC.

A major objective of the project was to identify the gaps between the current and future labour needs and management on farms and recommend strategies to address them. These loopholes constitute the main outcomes from the project and are addressed next.

Outcomes

5. Describe how the project's outputs will contribute to the planned outcomes identified in the project application. Describe the planned outcomes achieved to date.

A major output from the project was the set of position descriptions for the three positions identified on cotton farms which have been uploaded to the *myBMP* site and made available to farmers for recruiting. As indicated above a number of loopholes were identified in matching labour needs against supply sources. It is important to the industry's aim of developing capable people with the knowledge and skills to drive the industry that these loopholes are addressed. The loopholes are identified in this section and recommendations for addressing them presented in the next section.

Access to Skilled and Experienced or Qualified Lead Farm Hands/ Supervisory Staff

All groups of interviewees (experts, farmers, contractors and labour suppliers) noted that the lead farm or supervisor was the position most difficult to fill although the problem had eased with the downturn in the mining sector and access to overseas employees through the 457 visa program. The use of overseas workers implied that the supply of domestic workers was insufficient for this position. Nonetheless, there appeared to be sufficient flow of graduates with Certificates 4, Diploma or Advanced Diploma in Agriculture or Horticulture from TAFE or the Agricultural Colleges who could fill these positions. Unfortunately, they tend not to have the experience or required skills and are therefore not attractive to farmers. It must be noted that the government's recent curtailing of 457 visas may impact agriculture and therefore cotton adversely and new sources of skill needs to be considered.

In contrast to the situation above, a large number of permanent farm hands with the skills required had no formal qualifications but had served in their positions for long periods, in some cases ten or more years with no prospects for promotion to the next level. Farmers often reported that their employees were content with the status quo and that until employees make requests, they (farmers) would not 'upset the apple cart' by promoting employees to higher positions. The situation was compounded by limited avenues for advancement on small farms where the one or two lead hand positions were reserved for or occupied by family members.

The lack of opportunities for skill development and long-term employment in the industry for those seeking to enter as well as the absence of clear pathways for advancement through the ranks for employees working at the farm hand level had made cotton farm work unattractive as a career for many agricultural graduates. This was augmented by the limited prospects for employees to work towards purchasing their own farms in the future.

An attempt at equipping qualified TAFE graduates with the relevant skills by placing them on farms through a cadetship program, funded by the government, was not fully successful. Farmers did not have adequate capacity to employ these workers on a continuing basis after completing their training due to fluctuating output from changing climate. It appears then that providing training to upgrade qualifications of current employees on farms as per the NSW Government's Smart and Skilled program would be an appropriate strategy for building the capable workforce desired by the industry. The employees trained to enhance their qualifications would already have jobs and the practical experience required by farmers. This is elaborated in next.

Building a Capable Workforce on Cotton Farms based on 457 and 417 Visa Programs

The majority of farmers and contractors expressed that they preferred overseas employees, especially backpackers to domestic workers because overseas workers were more reliable and hardworking. Moreover the pool of backpackers on 417 visas was large enough to enable selection of good performing employees, allowing the building of a cohort of effective and efficient seasonal workers. Despite these advantages, some farmers mentioned that training efforts were time-consuming and expensive as each new set of backpackers had to be trained and lack of good English language skills posed WH&S problems. Moreover, the 417 visa program was constantly under review following the bad experiences of some backpackers on farms, thus diminishing their value as a stable source of labour. Reliance on 417 visa holders presents a source of vulnerability for the industry in the event of policy changes, or a reduction in backpackers visiting Australia or working on farms. A few farmers were able to recruit good backpackers through the 457 or regional migration visa programs for more permanent or longer-term employment.

Less than a quarter of the farmers interviewed had sponsored farm managers and subsequently farm supervisors (lead hands) through the 457 visa program. The later were more difficult to recruit under the 457 visa program because there was no specific skills category for them. Moreover, very few farmers with sponsored 457 visa employees were able to retain them. Many of the sponsored workers had moved to other farms or to other industry sectors at the end of the term agreed with their sponsors, despite very attractive salary packages. The barriers to retaining these employees such as the feeling of isolation in remote locations, lack of work for spouses of the employees, and lack of social amenities including schools for their children, were beyond the control of farmers. The inability to retain these employees over a significant period 'flies in the face' of building a capable workforce on cotton farms. Having permanent workers was essential to training and development and reduction in on-farm accidents. The difficulties with accessing and retaining domestic workers in the above positions led some farmers to suggest that labour was a major constraint to growing cotton. The solution to the above problems lies in making living and working in regional Australia and in the agricultural sector attractive to domestic workers as discussed in section 6 below.

Continuing Training and Development for Farmers and their Core Employees

Farmers referred to the rapid changes in technology on farms and admitted that they barely had enough time to fully understand and make effective use of their existing equipment before a new one emerged. They acknowledged the importance of updating their skills and limiting reliance on younger employees for the technological knowledge relevant to their operations. Farmers also felt it was necessary to update employees' skills with respect to emerging technology. Despite this, the cost of keeping up with equipment changes was beyond the

financial capacity of many farmers who continued to use their old machines or contracted out work requiring use of new machines. This appeared to be a 'scale of operations' problem since larger farm enterprises with large economies of scale and better access to capital markets were more able to keep up with the costs of installing new technologies. The amalgamation and corporatisation of farms may increase the number of larger farms, enabling greater uptake of new equipment. Even, so it may be more efficient for some farmers to contract work than have it performed in-house.

Based on the above outcomes, suggestions for building a capable workforce to meet the aims of the cotton industry are presented next.

6. Please describe any:-

- a) technical advances achieved (eg commercially significant developments, patents applied for or granted licenses, etc.);**
- b) other information developed from research (eg discoveries in methodology, equipment design, etc.); and**
- c) required changes to the Intellectual Property register.**

1. To build a capable workforce who will remain on farms, steps need to be taken by the agricultural sector more broadly and cotton specifically to provide the needed skills or qualifications to help farm hands and lead hands advance in their careers. In this regard, the NSW Government's Smart and Skilled program, aimed at assisting farmers and farm workers gain the appropriate qualifications, is a step in the right direction but dependent on employer support and employee motivation. Even so, other initiatives are required to assist those with the required qualifications to gain the skills needed to enter the industry. Co-ordinated efforts from the broader agricultural industry supported by the government are necessary to foster such initiatives.

In addition to the above, an attractive image of rural and regional living need to be created through the media to reverse the negative perceptions formed and encourage more people to take up agriculture as a career option. Despite this position, given the limited job openings in agriculture and the inability of graduates from TAFE to secure jobs in the sector, a destination survey of graduates from institutions that provide education and training for the agricultural sector is needed to assess the extent to which supply of labour from these sources meet demand in agriculture more generally and cotton specifically. It is necessary to ascertain how many qualified persons fail to enter the agricultural industry due to lack of job opportunities. If a significant percentage of agricultural and horticultural graduates are not absorbed into the industry, then training dollars are being wasted. Again this is a task recommended for the cotton industry acting in conjunction with other sectors of the agricultural industry.

A number of recommendations were made in the May 2016 report to change the perceptions of positions on cotton farms from jobs to careers. In particular, it was recommended that *'Establishing a clear pathway to a management position and even ownership of farms would be a major incentive for retaining employees. It would also resolve the succession problem for farmers whose children are not interested in the farm and allow farmers to recoup their investments over time.'*

2. What are the alternative to backpackers as a source of seasonal workers for cotton farmers? Two experts suggested the seasonal worker program as a possibility for retaining workers on seasonal basis and reducing training costs. Others argued that workers in the seasonal program have no exposure to the machines and other technology used on cotton farms. Even so, it is possible to recruit and train

knowledgeable workers through the program for seasonal skilled farm hand positions on cotton farms. Trained workers in the seasonal program present a more enduring source of labour than backpackers on the 417 visa program. Because many of the same seasonal workers would return year after year to the same farms, it is possible to build a capable workforce with this group more aligned with the aims of the cotton industry. The government could invest in the initial training of these employees to bring them up to the skills level required by farmers. Moreover, the better regulated and organised seasonal worker program would minimise the many problems reported for backpackers.

3. For continuous development and keeping up-to-date with changes in the industry, it was suggested that workshops, field days, equipment sellers, information and materials from Cotton Australia and other industry bodies, the internet and talking to other farmers were appropriate sources for the required knowledge. In addition, the manuals accompanying equipment purchased and support services provided by the equipment sellers constituted good sources of training in this area. The use of these sources to update knowledge was informal and not documented so that it was not possible for the industry to measure the extent to which the sources contributed to building a capable and connected workforce. Appropriate measures need to be devised to account for continuous development training of farmers and their employees.

Conclusion

- 7. Provide an assessment of the likely impact of the results and conclusions of the research project for the cotton industry. What are the take home messages?**

The implications of the project are that the cotton industry needs to reconsider the effectiveness of the current workforce strategies on farms for developing a capable and connected workforce, equipped with the knowledge and skills necessary to drive the industry. It is apparent that while the temporary 457 and 417 visa programs have helped fill gaps in labour supply they do not constitute an enduring source that would enable the industry meet its aims. Rather the alternatives discussed in section 6 of the report could be considered as longer-term strategies for achieving the objectives of human capital development on cotton farms.

Extension Opportunities

- 8. Detail a plan for the activities or other steps that may be taken:**
 - (a) to further develop or to exploit the project technology.**
 - (b) for the future presentation and dissemination of the project outcomes.**
 - (c) for future research.**

It is important that the position descriptions developed from the project are made widely available to farmers through the *myBMP* website.

It will benefit the cotton industry to identify and work with a representative number of agricultural and horticultural training institutions to ascertain the destinations of graduates from their institutions over the last five years. The aim is to assess the extent to which the industry absorbs graduates from these institutions and recommend strategies for addressing loopholes. Given that there were about a quarter of a million employees in the agricultural sector in 2011 with a declining trend over time, and the majority were farmers or relatives of farmers, job openings in industry for outsiders could be limited. Destination surveys would enable the industry ascertain how many qualified people are absorbed.

Closely associated with the above is a need for an effective strategy to provide graduates with the required skills training so they can build the practical experience required by farmers to gain employment in the sector. This requires working with industry participants and

educational institutions to develop a cadetship or farm placement program to allow trainees to build the relevant skills alongside their training in the various institutions. This may extend the period of their training but ensure that they have both the qualifications and experience for positions on farms.

Associated with the above is development of a new program in Agricultural Technology, working with industry members including educators, to build the skills and knowledge base for employees to engage with new and emerging technology on cotton farms. This will require a grant from the industry to work with educational institutions and associated persons to develop the program. The program should open new job opportunities to absorb graduates into the industry.

Also aligned with the above is the need to brainstorm with industry members, through focus group meetings, a strategy for absorbing graduates to work on farms through a clearly defined career pathway from the farm hand to farm manager position. An industry-wide co-ordination effort is required where qualified employees with the relevant experience can move through the ranks across farms. This same co-ordination among farmers can be used to provide sustained employment opportunities for employees, enabling assurance of work and income throughout the year.

With support from the cotton industry, focus group meetings could be organised with experts from the industry and other government bodies on strategies for converting part of the seasonal worker program, currently run by Jobs Australia, into one that can replace the backpacker program and provide an enduring source of seasonal labour for the cotton industry.

Again the industry can develop a system for farmers to document continuous training undertaken each year and improvements made to their farms through application of the knowledge gained. This documentation should present physical evidence of value added to the farm and enhance value on sale or transfer to the next generation.

9. A. List the publications arising from the research project and/or a publication plan. (NB: Where possible, please provide a copy of any publication/s)

We have not yet published any articles from the project but plan to write two articles on the project. The first will cover workforce planning and management on cotton farms and the second will deal with gaps in labour supply to the cotton industry. We will also consider an article on contracting in the cotton industry should the data collected allow us to do so.

B. Have you developed any online resources and what is the website address?

Yes the positions descriptions prepared for the three positions on cotton farms are available for use by cotton farmers at www.peopleinag.com.au

Part 4 – Final Report Executive Summary

Provide a one page Summary of your research that is not commercial in confidence, and that can be published on the World Wide Web. Explain the main outcomes of the research and provide contact details for more information. It is important that the Executive Summary highlights concisely the key outputs from the project and, when they are adopted, what this will mean to the cotton industry.

The project titled ‘Skills Profile and Labour Supply Structures on Cotton Farms’ was funded by the CRDC and covered the period from March 2015 to August 2018. The main aim was to determine current and future labour needs on cotton farms and assess these against supply of

labour to farms, identify gaps in meeting needs and recommend strategies to address the gaps. As part of achieving this broad aim, position descriptions were developed for recruiting employees on cotton farms. Furthermore, strategies used by farmers to retain core employees were assessed against industry trends to identify areas for improvement. The project enabled assessment of the extent to which current and future sources of labour would help the industry meet its goal of building a capable and connected workforce with the knowledge and skills to drive the industry and handle emerging challenges.

A qualitative research approach was used involving face-to-face and telephone interviews with various stakeholder groups associated with the research objectives. They comprised experts in cotton and associated industries, farmers, contractors, and labour supply firms. The interviews were transcribed with permission from interviewees and analysed for key themes. In total 11 experts, 32 farmers, 23 Contractors, and 10 labour supply firms were interviewed.

Three main positions were identified on cotton farms - farm hand, lead hand (or supervisor) and farm managers. Position descriptions were prepared for each and recruitment sources and selection processes identified, also for each position. Training was generally on-the-job and retention efforts involved providing incentives such as accommodation, vehicles, mobile phones and sometimes paying school fees of employees' children. The issues that required further investigation are highlighted below.

Farm Hands

The seasonal farm hand positions were generally adequately covered with backpackers and other employees on temporary contracts or by contractors, while the permanent farm hand positions were filled with locals, family members or employees recruited by word of mouth, through referrals, advertisement in rural newspapers and internet searches.

The research revealed that farmers wanted people with the experience to drive pickers and use the sophisticated equipment on cotton farms as well as demonstrate knowledge of plant health and soil performance. However, few applicants had the required skills, particularly with respect to driving the big and expensive machines. Training was expensive as it had to be repeated for each new cohort of seasonal workers and farmers were reluctant to invest the time and money to provide training. They wanted employees who were work-ready.

Over-dependence on backpackers for seasonal work meant any shock in their supply was costly to farmers, especially if it occurred during the harvest or planting season when they were most needed. Farmers who relied on contractors invariably faced the same problems, since contractors recruited from the same sources as farmers. Backpackers do not constitute a stable and enduring workforce upon which a capable and connected workforce can be built on cotton farms. Alternative sources of temporary or seasonal workers were suggested in the report including making work on farms attractive to domestic workers and exploring the seasonal worker program as a source for these positions. It must be noted that the trend towards a gig economy could see a rise in the use of seasonal workers and contractors on farms.

Farm Supervisors

There was an apparent gap with respect to the lead farm hand or supervisor position, emanating from lack of people with the required skills and experience. Employment agencies provided candidates with the relevant qualifications but not the required technical and management experience and farmers were unwilling to provide training to new recruits without the relevant skills due to the associated cost –paying full wages while training the employee. Furthermore, prospective employees were looking for permanent positions; this was inconsistent with the short-term positions on farms, presenting a mismatch between demand and supply.

The above situation poses a problem to Agricultural educational institutions - lack of suitable employment opportunities may discourage people from pursuing careers in the sector. The NSW Government's Smart and Skilled program, does not address this gap as it is aimed at upgrading the knowledge and qualifications of people already working on farms. An additional program is needed to address the gap in skills of potential employees who want entry to the industry. The externalities and free-riding associated with training by individual farmers mean the problem must be addressed at the industry and/or government level.

A cadetship training pathway appears to offer an effective solution to the skills and experience gap outlined above. It is envisaged that this would involve a one or two year period during which the trainee studies for the qualification (Diploma or Advanced Diploma) while employed in the industry. Among other things, it will be necessary to determine the institutional arrangements required to deliver such a program, as well as development of the course material consistent with TESQA and the Australian Qualifications Framework. The training would be aimed at the leading hand / supervisor role.

There is already a range of training / education being offered with an agricultural focus at both vocational and tertiary level. It would be remiss to develop a new training program without first determining what the existing programs are providing. Perhaps more importantly, it would be very useful to gain insight into the destination of graduates from these educational programs. Our research suggests that very few of them actually end up in the cotton industry.

Summary of Key Recommendations

The key recommendations from the report are summarised below. For appropriate matching of labour demand with supply on cotton farms and to ensure that employees have the appropriate skills and knowledge for building a capable and connected workforce, it is recommended that the industry:

1. Carry out destination surveys of graduates from agricultural education institutions to assess the extent to which they are employed in the agricultural sector more generally and cotton specifically.
2. Encourage development of advisory capacity to help farmers analyse, interpret, and use data on their farms for decision-making.
3. Mobilise employer and employee support for the NSW Government's Smart and Skilled program as a means of providing owners and their employees the relevant technical and management knowledge, skills and qualifications to enhance their performance.
4. Develop cadetships and other such programs to assist graduates with the required qualifications to gain the skills needed to enter the industry.
5. Develop a clear pathway from farm hand position to farm manager position and a system to allow qualified employees to advance across farms to higher positions. This should encourage employees to see their positions as careers and work towards advancing to higher positions. It will also help retain employees in the industry.
6. Explore the seasonal worker program as a stable source of supply of temporary farm hands to reduce vulnerabilities associated with dependence on backpackers.
7. Attract young energetic Australians to the industry through positive images in the media of living and working in regional and rural Australia. This should help reduce dependence on employees recruited through the 457 visa program and minimise exposure to associated adverse policy changes.
8. Carry out regular audits of working conditions on cotton farms to ensure they are appropriate and comply with relevant legislation. This should add to efforts at making the industry attractive to Australians.
9. Develop a system to help farmers keep track of their knowledge and skills development through the continuous training programs they undertake.

References

The following materials were consulted for the report:

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