

QUEENSLAND AGRICULTURE ENVIRONMENTAL SCAN

Labour and skills supply and demand profile



QUEENSLAND FARMERS' FEDERATION





This report was produced by the Queensland Farmers' Federation and Jobs Queensland in conjunction with the Rural Jobs and Skills Alliance.

ENQUIRIES

For enquiries or further information about this report, please contact Queensland Farmers' Federation:

P (07) 3837 4720

E workforceplanning@qff.org.au

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PURPOSE



Supplied by Pacific Reef Fisheries

This environmental scan identifies the current and emerging trends and critical issues impacting the workforce of the Queensland agriculture industry (producers of food, fibre and foliage) in the next three to five years. It is produced by the Queensland Farmers' Federation (QFF) in collaboration with the Rural Jobs and Skills Alliance (RJSA) and Jobs Queensland and with information and insights from the Queensland Department of Agriculture and Fisheries (DAF).

The RJSA was developed from the agricultural sector's need to engage more with the education and training sectors, and the Queensland Government's commitment to create and support jobs across the state. Industry members of the Alliance are (in alphabetical order): AgForce (Qld), Australian Prawn Farmers Association, Canegrowers, Cotton Australia, Growcom, Irrigation Australia, Nursery and Garden Industry Queensland (NGIQ), Queensland Dairyfarmers' Organisation, QFF and Timber and Building Materials Association and Tropical Carbon Farming and is supported by DAF.

This document is intended to guide discussion with stakeholders about the direction of the agriculture sector in Queensland in areas such as skills needs, diversity, the training system, attraction, retention, and business capability, to inform the development of a Queensland Agriculture Workforce Plan.

ACKNOWLEDGEMENT OF TRADITIONAL OWNERS

The Queensland Farmers' Federation, the Rural Jobs and Skills Alliance and Jobs Queensland acknowledge the Traditional Owners of the land and pay respects to their Elders past, present and emerging. We also acknowledge the diverse Aboriginal peoples and Torres Strait Islander peoples of Queensland and thank them for their ongoing custodianship of the lands, seas, waterways, stories, laws and customs. Aboriginal peoples and Torres Strait Islander peoples are acknowledged as the first farmers, foresters and fishers in this country having lived in harmony with the land, cultivated the landscape and fisheries, and harvested food, timber and fibre for millennia.



EXECUTIVE SUMMARY

As the agriculture industry (producers of food, fibre and foliage) changes in response to global and national markets, workforce issues are experienced across Queensland's regions and industry sectors. This report provides detailed and current information about workforce and industry trends and context to inform the Queensland Agriculture Industry Workforce Plan.

In Queensland, data shows the Division of Agriculture, Forestry, and Fishing (AFF) directly employs over 90,000 Queenslanders. The agriculture workforce has increased by 57.4 per cent from February 2016 to February 2021. As a result, agriculture is the 11th largest employer in Queensland and is responsible for up to 25 per cent of regional employment and 8.8 per cent of the state's registered businesses. Most agribusinesses are small or family businesses employing fewer than 20 employees.

In Queensland, the State Government identified agriculture as an emerging and priority industry to create knowledge-based jobs of the future. Indications of industry restructuring are identified in this report, including business diversification, technology adoption and consolidation to remain competitive in a global market. Agriculture holdings are amalgamating, resulting in larger and fewer farms, to benefit from economies of scale, improved productivity, technology and skilled workforce.

Industry restructuring is also driven by consumer tastes and an increasing interest in environmental and animal welfare issues, food origin and traceability, production methods, and demand for new and different products. Supply chain management is becoming more complex, and new technologies present both opportunities and challenges.

National forecasts indicate shifts in workforce composition as the number of owners and operators decrease and demand for managers and paraprofessionals increase. Australian Bureau of Statistics (ABS) data shows the average age of workers in agriculture in the state is seven years older than the rest of the workforce and predominantly male. Historically agriculture relied on seasonal, local and migrant workers with on farm training, as well as unpaid family farm workers including women. This poses a barrier to workforce planning as agriculture workforce is generally underestimated in currently available data.

The causes of labour shortages and other issues vary across regions and sectors. The horticulture, intensive livestock and broadacre cropping sectors in Queensland are significantly reliant on overseas and migrant workers, especially to meet seasonal needs. Workforce challenges include workplace health and safety, returning seasonal and casual workforce and attraction of highly skilled workers. Priority sectors for workforce planning in Queensland, based on gross value of production (GVP) and employment growth, are:

- **Grazing** - beef cattle and grains
- **Horticulture** - fruit and nuts, vegetables, and nurseries
- **Crops** - sugar and cotton
- **Emerging** - aquaculture.

Queensland has established a global reputation as a food-secure state, exporting 58 per cent of all agriculture output. With strong agricultural exports and farm gate and first stage processing figures, further growth is anticipated in some agricultural regions and sectors. Jobs Queensland's Anticipating Future Skills (AFS) data for



the selected agricultural industries projects that employment in agriculture will continue to grow between 2020 and 2024. Across the primary focus agricultural subdivisions for this report, AFS data projects that the highest growth is anticipated within the Mackay-Isaac-Whitsunday region, primarily due to projected increase in employment in the emerging aquaculture industry.

This report references data from the Australian and New Zealand Standard Industrial Classification (ANZSIC) AFF division, with a focus on the subdivisions of agriculture (01), aquaculture (02), and agriculture, forestry and fishing support services (05). There is a lack of accurate data about the true size and nature of the sector's workforce. This is acknowledged in the *National Agriculture Workforce Strategy* which highlights that current data is insufficient to provide an accurate picture of the agriculture labour force.

AFF provides more than 10 per cent of direct employment in the regions of Darling Downs-Maranoa, Queensland-Outback and Wide Bay. The fastest growing regions for AFF employment in the past year were Townsville, Wide Bay, Cairns, Central Queensland, Ipswich, Moreton Bay-North, and Gold Coast. Many of these regions are also reliant on industries such as tourism and mining which often compete with agriculture for workers in terms of both supply and wage rates.

The net effect of the COVID-19 pandemic on the 2020-21 GVP for the Queensland's primary industries was an expected decrease of \$87 million at the farm gate. Despite the challenges of the COVID-19 pandemic there was a 16.6 per cent increase in employment in AFF in Queensland in the 12 months to February 2021 in line with improved seasonal conditions, resulting in Queensland having the highest number of employees in AFF of any Australian state or territory.

The agriculture workforce is less likely to hold formal qualifications than the workforce overall. The RJSA reports that agricultural business operators are looking for workers who have experience, relevant skill sets and demonstrated capabilities, rather than focusing on qualifications. They consider that training needs to promote re-skilling and continuous learning in the workplace with a preference for micro-credentialing and stackable credentials that may over time lead to a full qualification for individual workers.

Addressing agricultural workforce skills and needs is a shared priority for all governments, including reforms to the Vocational Education and Training (VET) and higher education sectors, workplace rights and obligations, the National Labour Hire Registration Scheme, and a National Agricultural Innovation agenda.

Based on the issues identified in this report, four Queensland-specific action areas were identified. Focusing on these will build agriculture workforce and businesses:

- **Adaptability** – developing entrepreneurship and business capability for innovation and adaptation to change
- **Attraction and diversity** – developing a diverse and inclusive future agriculture workforce
- **Retention** – developing agriculture careers and opportunities and becoming employers of choice
- **Skilling** – developing future workforce skills in agriculture

The Queensland Agricultural Industry Workforce Plan 2022-2027 will identify strategies to respond to skills needs and shortages which impact the growth, profitability and productivity of Queensland's agribusinesses over the next five years.

CONTEXT

In Queensland, agriculture is one of several emerging and priority sectors identified as part of the Government's Advance Queensland initiative to create knowledge-based jobs of the future for Queenslanders.

The Queensland Agriculture and Food Research, Development and Extension 10-Year Roadmap and Action Plan outlines a shared government and industry vision that Queensland's internationally recognised agriculture and food research development and extension will underpin a productive, profitable, and sustainable sector. A skilled workforce is critical to achieving that vision and the roadmap provides a clear mandate for workforce development.

The Queensland Roadmap and Action Plan identifies the strengths of Queensland's agriculture and food industries as:

- new technologies, tools, and plant varieties that enable producers to remain economically viable
- high-quality, safe food and agricultural products that are affordable and available year-round
- increased exports and growth in regional jobs.

Challenges include:

- accessing funding and investment capital
- adoption of research, development, and engineering (RD&E) outputs
- identifying gaps in skills and capability
- adapting to a changing climate.

Nationally, Ag2030 sets out a government-backed and industry-led plan to grow the Australian agriculture sector to a \$100 billion industry by 2030. Human capital – enabling people and their communities right across the agriculture supply chain with the support, infrastructure, and skills to do their jobs – is one of the Ag2030 plan's seven themes for action.

In March 2021, the Australian Government released the National Agricultural Labour Advisory Committee's report National Agriculture Workforce Strategy together with a Roadmap to attract, retain, upskill, and modernise the agricultural workforce. The strategy aims to ensure farmers have access to a fit-for-purpose workforce into the future. The strategy considers the challenges facing the industry and recommends 37 actions to support agribusinesses and related industries to support the attraction, retention and development of the future agricultural workforce, key to delivering the Ag2030 plan.

The Australian roadmap acknowledges the impact of COVID-19 on agricultural workforce supply and confirms that addressing agricultural workforce matters is a shared priority for all governments that will continue to be a key strategic focus for all agriculture ministers in Australia. It highlights the themes of securing, skilling and realising the potential of the agricultural workforce, underpinned by leadership and foundation work.

This environmental scan draws on industry knowledge, experience, and insights as well as published data and information to identify the current and emerging trends and critical issues impacting the workforce of the Queensland agriculture sector to guide discussions with stakeholders and inform the development of an agriculture workforce plan for the state.

Data limitations

This report was completed in mid 2021. The data is correct at the time of preparation and has been updated in the Queensland Agriculture Industry Workforce Plan 2022-2027. The National Agriculture Workforce Strategy notes that currently available data is insufficient to provide an accurate picture of the agriculture labour force. The most complete data source is provided by the Australian Bureau of Statistics (ABS) Census of Populating and Housing, last conducted in 2016.

While the Australian and New Zealand Standard Classification of Occupations (ANZSCO) provides a basis for the standardised collection, analysis, and dissemination of occupation data, it does not capture new and emerging occupations. It also does not reflect the evolution of existing occupations and their skillsets.

Between censuses, data is based on the Quarterly Labour Force survey which is based on a sample at a set time and does not provide the industry with accurate and reliable detailed data. Neither of these sources accounts for peak labour periods, nor do they include overseas residents in Australia or employment of temporary migrants. The census data may also not capture the status of women and family members.

Data referenced throughout this report is from the most currently available sources.

The principal focus of this report is on Queensland's main agricultural industries according to their Gross Value of Production (GVP). It focuses on the ANZSIC subdivisions of Agriculture (01) and Agriculture, Forestry and Fishing Support Services (05), as well as the emerging sector of Aquaculture (subdivision 02), with specific reference to the following relevant group and class codes:

- 011 nursery and floriculture
- 012 mushroom and vegetable growing
- 013 fruit and tree nut growing
- 014 sheep, beef cattle and grain farming
- 015 other crop growing (particularly 0151 sugar cane and 0152 cotton growing)
- 016 dairy cattle farming
- 017 poultry farming
- 019 other livestock farming (particularly 0192 pig farming)
- 020 aquaculture
- 050 agriculture and fishing support services nfd
- 052 agriculture and fishing support services

These are collectively referred to as selected agricultural industries throughout this report.

Where disaggregated data was not available divisional AFF, and national data is used.

The field of education in agricultural industries in Queensland referred to in this report comprises –agriculture, horticulture and viticulture, fisheries studies and other agriculture, environmental and related studies.

PART 1

CURRENT SITUATION



PART 1: CURRENT SITUATION

Agriculture is a significant contributor to Queensland's economy, employment and communities, predominantly in rural and regional areas. More than 88 per cent of Queensland's land is currently used for primary production. Most of this is used for grazing (86 per cent of the state), followed by sown pastures (9.31 per cent). Queensland's agribusinesses total 40,690 as of June 2020.

Queensland has established a global reputation as a food-secure state, exporting 58 per cent of all agricultural output. More than 50 per cent of meat products, 83 per cent of sugar, 93 per cent of grains and grain products, 74 per cent of cotton, and 47 per cent of seafood products are exported, while beef cattle farming accounts for 49 per cent (8740 farms) of all farms in Queensland.

Agriculture is affected by a unique combination of external factors including seasonal conditions, market conditions, commodity prices, exchange rates, trade agreements, biosecurity, access to infrastructure such as transport and power, supply chain integrity, and skilled and unskilled labour.

Economic contribution

Latest data show the value of Queensland's agricultural commodities is forecast to be \$19.02 billion for 2020-21. Exports of Queensland agricultural products have increased by 77 per cent in the past 10 years to \$9.54 billion in 2019-20. By value, China, Japan, the United States, and South Korea are the biggest export destinations. Meat products represent more than 70 per cent of the total export value. Currently Queensland's top four agricultural industries, measured by estimated GVP are meat products, horticulture, sugar cane and cereal products.

Queensland AgTrends note that while bulk commodity exports were largely unhindered during the COVID-19 pandemic, products were diverted between markets. The domestic nursery sector boomed due to an increase in demand for in-home gardening with the sector reporting that farm gate value increased by approximately 30 per cent. However, there were anecdotal reports of plough-ins and reduced horticultural plantings due to labour shortages at harvest time. The net effect of the COVID-19 pandemic on the 2020-21 GVP for Queensland's primary industries was expected to be a decrease of \$87 million at the farm gate.

Employment

Employment in agriculture fluctuates throughout the year. AFF in Queensland provides jobs for 90,559 people or 3.48 per cent of the state's workforce and more than 348,000 jobs across the supply chain. The sector considers the current data significantly underestimates the actual number of people who work in agriculture, especially family farm workers including women who are not necessarily employed and lifetime Australian seasonal workers who are not always counted in employment statistics.

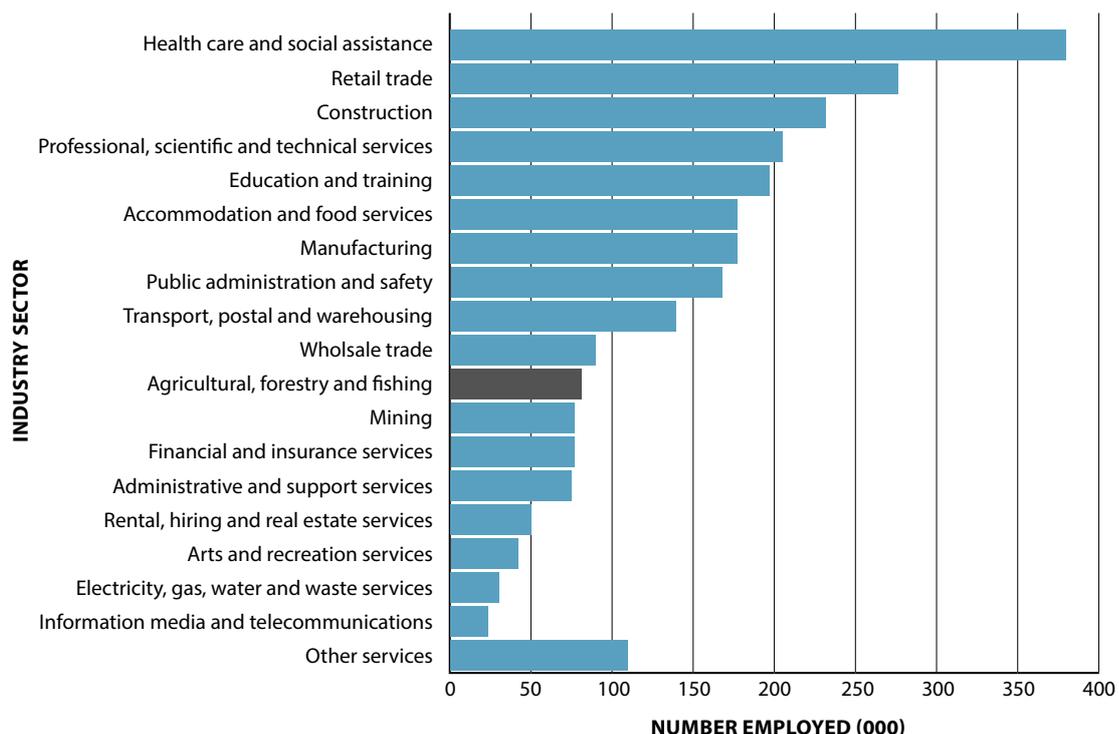
The Working Holiday Maker (WHM) program, the Seasonal Worker Program (SWP), and Pacific Labour Scheme (PLS) have contributed significantly to the workforce in industries such as horticulture, intensive livestock, broadacre cropping and meat processing industries, are not included in census and labour force collection data and hence the official statistics are likely to underestimate the contribution of these temporary agricultural workers. From April 2022, the Seasonal Worker Program and Pacific Labour Scheme will be consolidated, reformed and replaced by a more flexible and efficient single program.

Figure 1 shows AFF employment compared with other industry sectors in Queensland for the February 2021 quarter.



**Figure 1:
Queensland
employment
profile,
February 2021**

Source: ABS, 6291.0.55.001,
2021, Labour Force,
Australia, Detailed

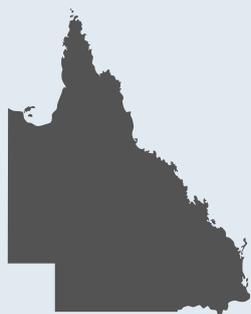


The level of agriculture employment in Queensland increased in the past year (as measured by the annual averages over the four quarters), making Queensland the biggest employer of agriculture in Australia, as shown in Table 1.

**Table 1: AFF
employment by
state/territory,
February 2016 to
February 2021**

Source: ABS, 6291.0.55.001,
2021, Labour Force,
Australia Detailed

State	Feb 16	Feb 21	Change Feb 16 to Feb 21	% Change Feb 06 to Feb 21
Queensland	57,532	90,556	33,025	57.4%
New South Wales	84,771	88,251	3,480	4.1%
Victoria	89,680	84,482	(5,198)	-5.8%
Western Australia	26,797	34,746	7,949	29.7%
South Australia	38,501	31,905	(6,596)	-17.1%
Tasmania	13,171	17,552	4,381	33.3%
Northern Territory	934	2,290	1,355	145.1%
Australian Capital Territory	692	1,139	446	64.5%



AFF in Queensland
provides jobs for
90,559
people



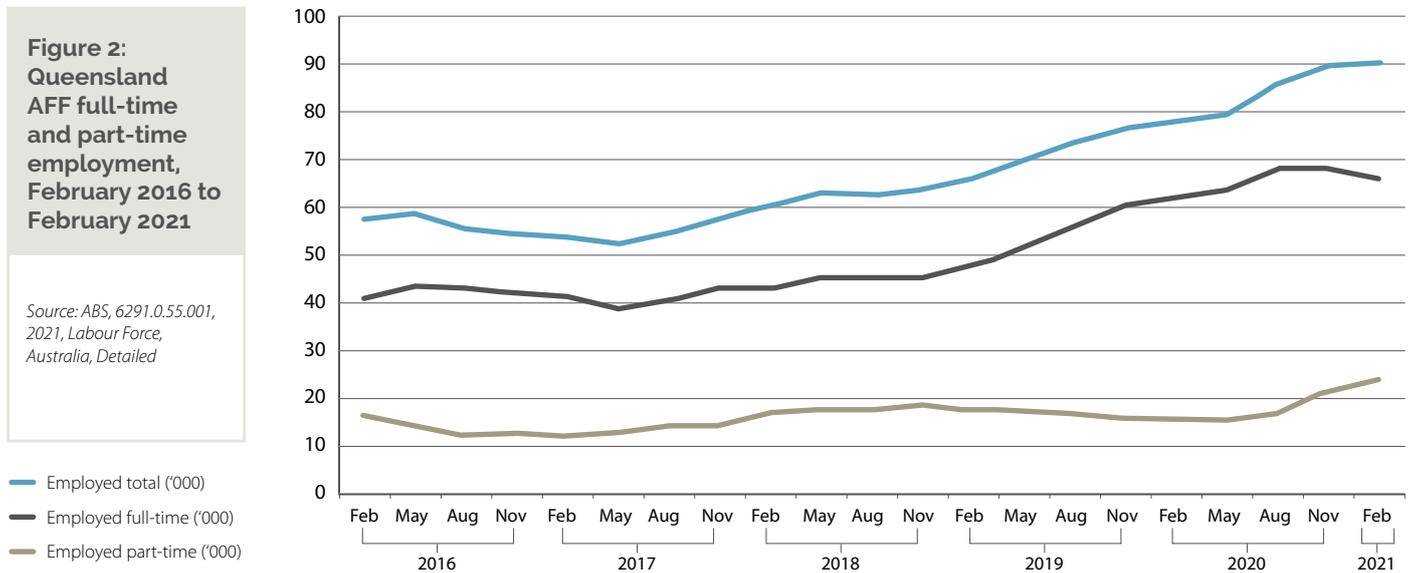
And more than
348,000
jobs across the
supply chain

Employment status

The total number of people employed in Queensland AFF grew by 57.4 per cent in the five years from February 2016, compared with 6.3 per cent in the state's overall employment. Both full-time and part-time employment grew during this time, as shown in Figure 2. The overall growth may be attributed to the structural change in the industry including farm consolidation which is increasing reliance on labour outside the family unit.

Figure 2:
Queensland
AFF full-time
and part-time
employment,
February 2016 to
February 2021

Source: ABS, 6291.0.55.001,
2021, Labour Force,
Australia, Detailed



Casual and contract labour employment varies across seasons, regions, and agricultural industries. As of June 2019, Queensland employed more than a third (15,540) of all overseas, and casual and contract workers in agriculture in Australia. Figure 3 shows demand in Queensland is relatively consistent compared with other states. DAF modelling shows there is a peak across the winter months in Queensland coinciding with winter vegetable production.

Figure 3: Number
of casual and
contract workers
on farms in each
month, by state,
2018–19

Source: ABARES, 2020,
Labour Use in Australian
Agriculture

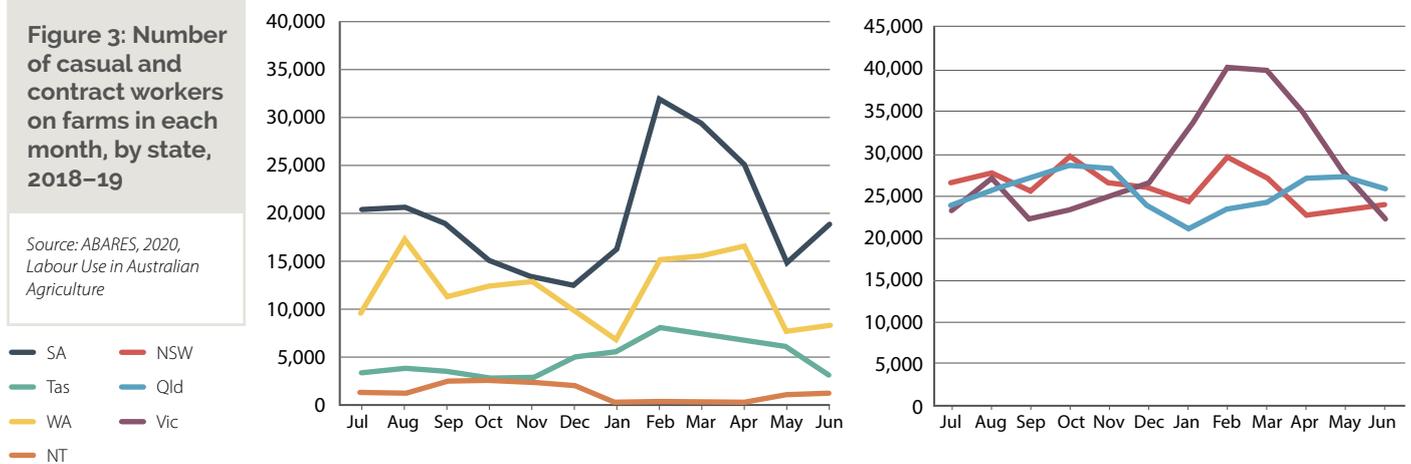
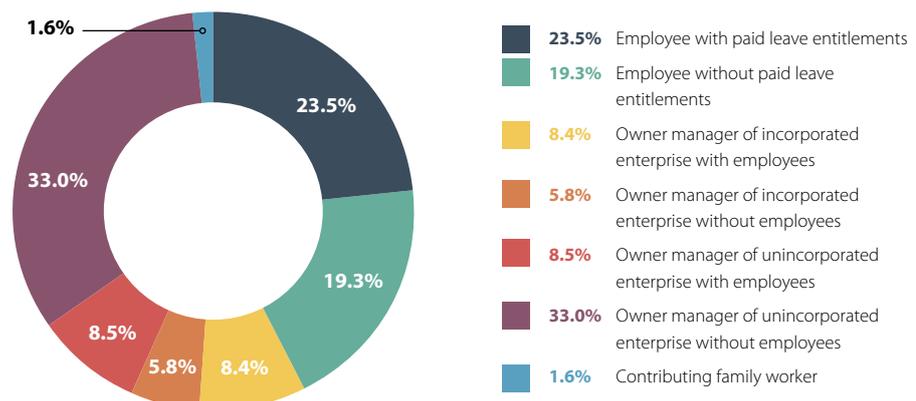


Figure 4: AFF
employment
status nationally,
February 2021

Source: ABS, 6291.0.55.001,
2021, Labour Force,
Australia, Detailed

The dominant form of employment in AFF nationally is owner-managers, who represent 55.7 per cent of all AFF workers (Figure 4). Most owner-managers do not have employees.



Industry and regional employment

Agriculture nfd,¹ aquaculture, other crop growing, and fruit and tree nut growing increased their employment in the year from February 2020 to February 2021 while other subsectors decreased employment, as shown in Table 2.

Table 2: Selected agricultural industries employment Queensland, February 2020 to February 2021

Source: ABS, 6291.0.55.001, 2021, Labour Force, Australia, Detailed

ANZSIC group	February 2020	February 2021	Annual change	% change
010 Agriculture nfd	3647	13,898	10,251	281.1
011 Nursery and floriculture production	2372	1770	(602)	-25.4
012 Mushroom and vegetable growing	6482	4185	(2297)	-35.4
013 Fruit and tree nut growing	5915	8300	2385	40.3
014 Sheep, beef cattle and grain farming	41,047	40,971	(76)	-0.2
015 Other crop growing	3455	5781	2326	67.3
016 Dairy cattle farming	3122	2265	(857)	-27.5
017 Poultry farming	2624	2322	(303)	-11.5
019 Other livestock farming	2943	2227	(716)	-24.3
020 Aquaculture	233	864	631	270.8
050 Agriculture and fishing support services nfd	140	104	(36)	-25.4
052 Agriculture and fishing support services	3634	3001	(633)	-17.4



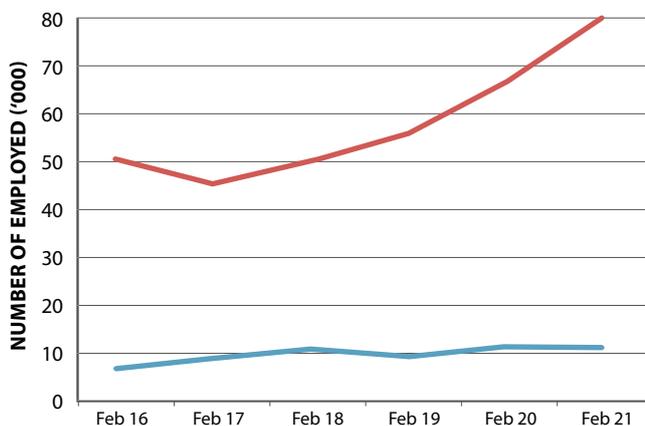
Employment increased by 48.5 per cent in Greater Brisbane and 58.7 per cent in the Rest of Queensland. The increase in AFF employment in the regions compared with Brisbane over the past five years (Figure 5).¹⁷

AFF provides more than 10 per cent of direct employment in the Darling Downs-Maranoa, Queensland-Outback, and Wide Bay regions.

Figure 6 shows AFF employment in each region in 2016 compared with 2021. For the Rest of Queensland employment increased in all regions except for Mackay-Isaac-Whitsunday, and Toowoomba. For Greater Brisbane employment increased significantly in Ipswich, Logan-Beaudesert, and Moreton Bay-North.² In part, this may be attributable to urban development pressures including land use changes around urban centres and housing affordability.

Figure 5: Queensland AFF employment, by Greater Brisbane and Rest of Queensland, February 2016 to February 2021

Source: ABS, 6291.0.55.001, 2021, Labour Force, Australia Detailed

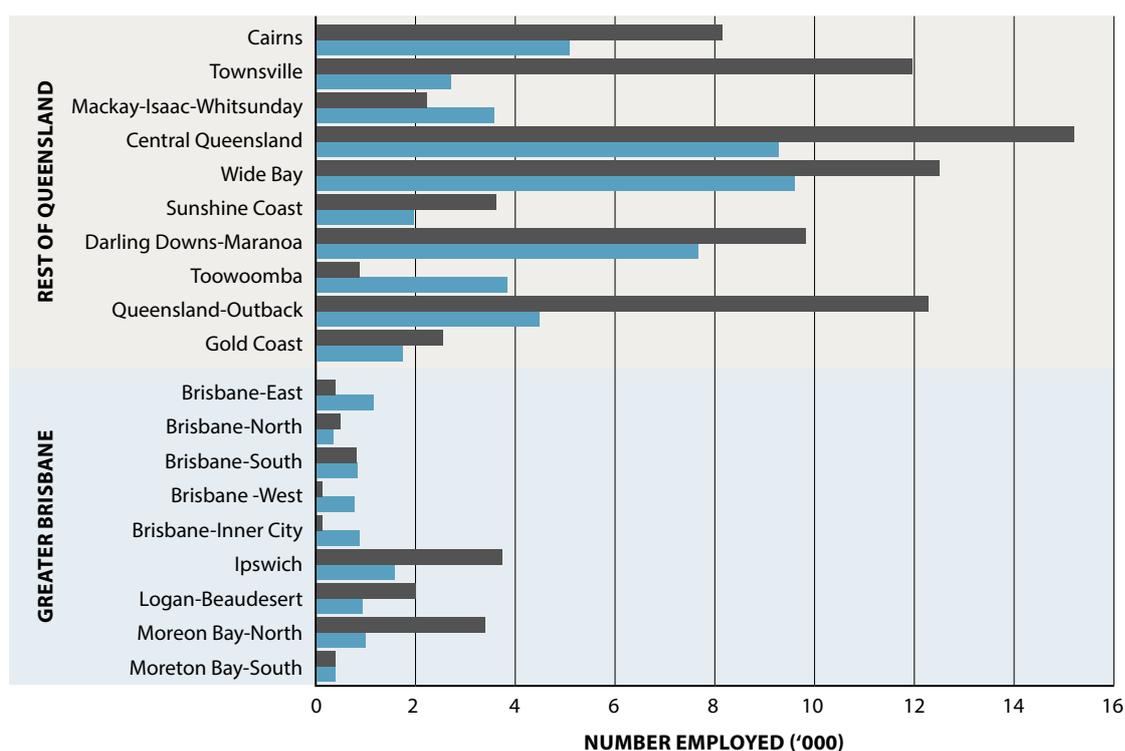


— Greater Brisbane
— Rest of Queensland

Figure 6:
Queensland AFF
employment, by
region, February
2016 and
February 2021

Source: ABS, 6291.0.55.001,
2021, Labour Force,
Australia Detailed

February 2021
February 2016



Businesses

In most rural and regional local government areas in Queensland, more than 25 per cent of businesses are AFF businesses. AFF is a major regional employer, accounting for up to 25 per cent of total direct employment.

Farm numbers have been declining slowly, but the average farm size has increased. In Queensland most businesses involved in AFF are small businesses based on employee numbers, with 56 per cent having no employees apart from the family business owners, and 40 per cent having less than 20 employees. Of the 464,990 registered businesses in Queensland as of 30 June 2020, 40,690 or 8.8 per cent were operating in AFF. Only three industries had a greater proportion of Queensland businesses than AFF, as shown in Table 3. From 30 June 2018 to 30 June 2020, the total number of registered AFF businesses declined by 1.5 percent with fewer than 614 businesses.

Table 3:
Registered
businesses
by industry,
Queensland, 30
June 2020

Source: ABS, 8165.0, 2021,
Counts of Australian
Businesses, including
Entries and Exits

Industry	Number	%
Construction	77,077	16.6
Professional, scientific and technical services	53,856	11.6
Rental, hiring and real estate services	52,993	11.4
Agriculture, forestry and fishing	40,690	8.8
Financial and insurance services	38,743	8.3
Transport, postal and warehousing	35,302	7.6
Health care and social assistance	29,187	6.3
Retail trade	25,761	5.5
Other services	22,597	4.9
Administrative and support services	19,711	4.2
Accommodation and food services	17,651	3.8
Manufacturing	16,653	3.6
Wholesale trade	13,644	2.9
Education and training	6,745	1.5
Arts and recreation services	5,648	1.2
Information media and telecommunications	3,463	0.7
Mining	1,817	0.4
Electricity, gas, water and waste services	1,394	0.3
Public administration and safety	1,383	0.3
Not classified	678	0.1
Total (a)	464,990	100.0

Occupations

The *National Agricultural Workforce Strategy literature review* identifies 400 occupations in AFF ANZSCO classifications from the 2016 Census. Jobs Queensland's Anticipating Future Skills data identifies the top 10 occupations by the number of people employed in selected agricultural industries in Queensland in 2020, as shown in Table 4. The occupation with the highest number is livestock farmer which is defined as workers who "plan, organise, control, coordinate and perform farming operations to breed and raise livestock".

Table 4: Top 10 occupations for selected agricultural industries, Queensland, 2020

Source: Jobs Queensland, 2020, Anticipating Future Skills

No.	AFF occupation	Number employed
1	Livestock farmers	15,467
2	Crop farmers	9470
3	Mixed crop and livestock farmers	6136
4	Crop farm workers	5764
5	Livestock farm workers	5663
6	Agricultural, forestry and horticultural plant operators	2120
7	Packers	1080
8	Mixed crop and livestock farm workers	1051
9	Garden and nursery labourers	989
10	Truck drivers	843

The occupation with the highest number is livestock farmer which is defined as workers who "plan, organise, control, coordinate and perform farming operations to breed and raise livestock".



Supplied by Department of Agriculture and Fisheries

Demographics

The agriculture industry workforce is diverse with a significant reliance on women and overseas workers whose data is not currently reflected in the current collection of official statistics. Self-employment is very common and family farming is officially recognised as the dominant mode of agricultural production.²⁰ While family and other Australian workers make up most of the workforce, overseas workers are used substantially in the horticulture sector.²¹

Age

The 2016 ABS Census data showed the median age of all categories of agricultural industry workers – 49 years – was older than the median of the general Australian workforce of 40 years. In Queensland, agriculture has the highest average age of any industry subdivision of 47.1 years, seven years older than the state average.

Nationally, as of February 2021, the occupation with the highest percentage (55.3 per cent) of workers over the age of 55 were farm managers, an increase of 7.5 per cent. The number of people employed as skilled animal and horticultural workers increased by 2.1 per cent, with 22.8 per cent of people in this occupation aged over 55. The occupation other farm, forestry and garden workers increased its level of employment by 4.4 per cent, with 21.4 per cent aged over 55.

Gender

Women represent 36.1 per cent of the AFF workforce in Queensland. Just over a third of business owners and managers in regional Queensland are women.²² However, these figures are widely acknowledged by industry representatives as underestimating the extent of women's contribution to the sector. A Griffith University report prepared in conjunction with the QFF estimates that women contribute about half of the total value of output (49 per cent) attributed to farming communities through their paid and unpaid activities including the majority (84 per cent) of off-farm income and this is vital for the maintenance of the farming enterprise.²³

The *National Agriculture Workforce Strategy* also notes that while ABS data showed women in 2019 account for 29.9 per cent of the official agricultural workforce in Australia, this figure is likely to be much higher because the additional work of female family members on farms was not reported.

Women represent 36.1 per cent of the AFF workforce in Queensland. Just over a third of business owners and managers in regional Queensland are women.²²



Supplied by Department of Agriculture and Fisheries

Aboriginal and Torres Strait Islander People

The intersection of Aboriginal traditional knowledge and contemporary agriculture is providing innovative and collaborative enterprise and employment opportunities. This includes the development of partnerships and enterprises for bushfoods and medicine, carbon farming and other traditional land management practices, and agritourism based on cultural heritage. Some ventures in bushfoods are established and in development in partnership with Aboriginal communities and corporations with the intention of providing employment²⁴. However, there is scope for increasing the involvement of Indigenous people. The CSIRO framework for growing this sector in Northern Australia in partnership with Aboriginal communities was developed with an aim of providing employment.²⁵

Modest gains in employment of Aboriginal and Torres Strait Islander people in the agriculture industry are evident. Based on the 2016 census, one per cent of people employed in agriculture in Queensland identify as Aboriginal and/or Torres Strait Islander – 26 per cent of whom were employed as managers.²⁶ The *Queensland Agriculture Snapshot 2018* reported that 2% of the agriculture workforce identify as Aboriginal and/or Torres Strait Islander, which is equivalent to overall workforce representation.²⁷ Aboriginal pastoral and land holdings provide the basis for business, training and employment in fields such as traditional land management, bushfoods, carbon farming and livestock farming.

Overseas workers

Regions differ significantly in the extent to which overseas workers are employed throughout the year and during key harvest periods. Reliance on casual and contract labour from overseas is highest in regions with high volumes of horticultural production and a range of seasonal crop types, such as the vegetable producing regions of the Lockyer Valley and Wide Bay as well as tropical fruit and strawberry production on the Sunshine Coast.²⁸

The supply of overseas workers on Working Holiday Maker visas and from the Seasonal Worker Program declined significantly following the introduction of COVID-19 containment measures which curtailed international travel. The major impact was on the number of Working Holiday Makers, which fell by 64 per cent in 2020 to around 61,000.²⁹ While ABARES projections assume a staged return to pre-COVID-19 levels of overseas labour supply in 2021-22 and 2022-23, the fall in labour supply in 2020-21 is expected to impact horticulture production.³⁰

Education and training

While historically most farm workers acquired skills through on-the-job learning, the industry is also supported through university and vocational education and training courses, extension programs, registered training organisations (RTOs), agriculture high schools, apprenticeships, and courses via remote delivery. TAFE Queensland offers a range of practical courses in rural operations, agriculture, and agribusiness management, as well as conservation and land management, as do other RTOs. Unaccredited training including industry extension and technical advice services also have a strong history in the agricultural industry. No formal data is available on the number of people who take part in unaccredited training in the agriculture industry.

Of the 11 universities operating in Queensland, the University of Queensland and University of Southern Queensland offer the

broadest range of agriculture-related undergraduate and post-graduate courses. Prior to 2021, national university enrolments in agriculture studies were declining. However, with the reduction of tuition fees for agriculture studies, enrolments increased significantly in 2021 with the University of Queensland reporting that enrolments more than doubled, increasing from 22 in 2019 to 50 in 2021.

Compared with the Australian workforce at the time of the 2016 census, agriculture had a greater proportion of workers with no recognised non-school qualification and higher-level qualifications were less prevalent (Table 5).

The field of education in agricultural industries in Queensland is predominately Certificate III and IV level qualifications (Figure 7).

A detailed profile of education and training is at Appendix 1.

Table 5:
Comparison
of completed
formal
qualifications,
2016

Source: Binks et al. 2018,
based on ABS Census of
Population and Housing
data

Qualification	% of agricultural workforce	% of Australian workforce
Postgraduate Degree level	2	7
Graduate Diploma and Graduate Certification level	1	3
Bachelor Degree level	10	22
Advanced Diploma and Diploma level	9	11
Certificate level	23	24
No recognised non-school qualification	55	33

Figure 7:
Qualification
levels for
selected
agricultural
industries,
Queensland,
2020

Source: Jobs Queensland,
2020, Anticipating Future
Skills



VET Employment Outcomes

The National Centre for Vocational Education Research (NCVER) provides VET data to 2020.³² NCVER reports that employment of all VET qualification completors in Queensland increased from 4,355 completions in 2016 to 4,735 completions in 2019. In 2020, employment outcomes declined to 68.1 per cent from 79.4 per cent in 2019. Employment of qualification completors in agriculture, environmental and related studies declined from 87.3 per cent in 2016 to 65.5 per cent in 2020. This represented a significant drop from 75.7 per cent in 2019. In the Agriculture, Horticulture and Conservation training package employment of all VET qualification completors in Queensland had declined overall from 85.8 per cent in 2016 to 74.3 per cent in 2019 and 63.9 per cent in 2020. The decline in 2020 is an anomaly in a pattern of increasing or relatively stable employment outcomes and possibly attributable to COVID-19 in 2020 and its impact on the labour market.

Of all VET qualification completors in 2020, 23.8 per cent gained

employment in the same occupation as their VET qualification in Queensland. This fell from 29.9 per cent in 2019. VET qualification completors in agriculture, environmental and related studies who secured employment in the same occupation as their qualification are lower than the results for all Queensland VET qualification completors. For 2019 and 2020, employment in the same occupation as the qualification was static at 16.4 per cent, having declined from 21.2 per cent in 2018. In the Agriculture, Horticulture and Conservation training package, employment in the same occupation as the completed VET qualification declined from 21.3 per cent in 2018 to 14.2 per cent in 2019 with a slight increase to 15.4 per cent in 2020. The pattern of declining or stable employment outcomes for qualification completors in 2020 in securing employment in the same occupation in 2020 is possibly due to COVID-19 and contraction of the labour market. Overall employment outcomes in the same occupation as agriculture qualifications are not high, while employment outcomes more generally are higher.

PART 2

DRIVERS OF CHANGE



PART 2: DRIVERS OF CHANGE

Agriculture in Australia continues to be challenged by social, economic, environmental, and technological challenges that are shaping the future of farming. These challenges include:

- Markets and trade including increasing competition, consumer preferences and global demand
- Technological innovation and disruption
- Climate change and biosecurity
- Environment including land management, water supply and soil quality
- Business practices and diversification
- Workforce demographics
- Workplace practices including health and safety

The RJSA's submission to the *National Agricultural Workforce Strategy* notes that agriculture remains a highly diverse job market. The rapid pace of technology provides significant opportunities for agriculture while also challenging current industry roles, education, and training requirements. Agritech is a developing area of innovation, start-ups, research and application bringing adoption challenges as well as efficiencies and gains to agribusinesses. Innovations in robotics, smart farms and blockchain are bringing new approaches to farm management and workforce. QFF suggests that, consequently, business decisions are less likely to be made solely by managers and more likely to be backed up by data-driven insights and that farm businesses will increasingly require knowledge of regulation, markets, and the ability to lead and manage staff.

Labour challenges are a constant issue in agriculture. Labour supply is impacted by the ageing workforce and internal migration to urban areas and in rural and remote regions these issues may be more pronounced. The available labour supply often does not meet agricultural needs due to the characteristics of the work, such as

Farm businesses are increasingly acknowledged in the industry as having to deal with a changing environment in terms of legislation, new technology, and work practices which will require farmers to handle a combination of managerial skills, technological, and environmental skills.

the remote locations, the casual nature of the job, the physically demanding roles, and the need for flexibility in working hours.

Farm businesses are increasingly acknowledged in the industry as having to deal with a changing environment in terms of legislation, new technology and work practices which will require farmers to handle a combination of managerial skills, technological, and environmental skills.

Farms will increase their reliance on experts and advisors with specialist skills. The RJSA's submission to the *National Agricultural Workforce Strategy* projects an increase in the number of contractors providing services to the farms in the next 10 years. The current workforce will also need to engage in continuous learning to adapt to evolving changes. The submission suggests it is likely that the workforce will require more people to be trained on the job and continuously update their skills.

Increased interstate and intrastate migration, especially since COVID-19 may present opportunities to boost workforces in regional Queensland.

Markets and international trade



The growing demand for food and agricultural exports in Asia is a source of both opportunity and risk for Queensland's agriculture and food industries. Rising living standards mean increasing demand for quality food products and for additional value-adding in all dimensions of quality.³³

Consumer tastes and an increasing interest in environmental and animal welfare issues, food origin and traceability, and production methods are all driving demand for new and different products that impact what the sector produces. This in turn influences production methods and workforce practices, as well technology adoption. For example, blockchain supports food provenance, which is particularly important for the organics sector and tracing food chains. To keep up with growing demand, Queensland farmers may need to expand their skills and knowledge of doing business overseas while also seeking ways to integrate new technologies.

The composition of Queensland's agricultural export market leaves the industry vulnerable to political influences in trade negotiations and arrangements.



Climate and biosecurity

The *Queensland Agriculture Snapshot 2018* acknowledges that the state's climate is diverse, variable and changing with significant implications for seasonal conditions and production schedules. The incidence of extreme weather, such as cyclones, floods, droughts and fires, as well as rising ocean acidification and heat will have impacts on the nature of work as well as the requirements for workers due to seasonal changes, labour supply and demand. Provision of a suitable skilled workforce in these conditions is a critical component of resilience, maintaining productivity and growth, and planning for and responding to workforce needs to take account of the different skills requirements of large and small operations.

Farmers are exposed to climate variability and its effects on production across Queensland's regions. Cropping farms can be more susceptible to the effects of climate variability than beef farms. The sector reports that farmers are increasingly using the weather forecast to assess their risk and put in place risk mitigation measures. Improvements in technologies can also contribute to mitigating risk.

Water is a critical input for agriculture. Dairy, cotton and sugar are the largest water users. Water security is at risk from climate change. While irrigated agriculture is highly productive, it is particularly exposed to climate risks. More efficient water management measures are being implemented with water use in agriculture decreasing. However, rising temperatures may impact water demand. Water challenges call for innovation in irrigation and irrigated agriculture based on water efficiency and management, crop breeds, new technology and improved agriculture practice and mix.

The *Agriculture Sector Adaptation Plan*,³⁷ produced in a partnership between the agricultural industry and state government in 2017, proposes that continuous improvement of capacity to adapt, coupled with increased knowledge and understanding of climate change, will enhance farm resilience. Farmers will need to be able to undertake assessments to inform decisions about risk, innovation, ecosystem services and adaptation. Feedback during the planning process indicated that the industry is adapting but requires more decision support and expertise. There are clear implications for skills and training in this changing scenario particularly in relation to farm operations and management.

The global pandemic has highlighted the importance of maintaining biosecurity, especially in Queensland's North where exposure to tropical diseases and pest risks are high.

Climate and biosecurity risks are strongly related with climate extremes expected to widen the range of significant pests and diseases. Biosecurity is critical for agriculture with recent advice issued by the State Government about measures for preventing African swine flu. Enhancing biosecurity capability across the agriculture industry is a policy priority. This has implications for the skills required by the workforce to effectively manage biosecurity risks and adhere to regulations. As was evinced in the ongoing COVID-19 outbreak, biosecurity risks can impact the supply and mobility of labour to meet demand, particularly for casual and seasonal work.

Technology

Development and adoption of technology and automation are key drivers of change that will affect the workforce as advances such as drones, autonomous vehicles, robotics, artificial intelligence, blockchain and biotechnology reshape the agricultural industry.

Upskilling the agricultural workforce to embrace technology will be vital for Queensland to remain globally competitive. Workers will need skills, not just to create and deploy the technology but to respond to it, such as data analysis. As well as technical skills, important enabling capabilities such as collaboration, critical thinking, complex problem solving, and entrepreneurship will be necessary across the industry.

Nationally an Agriculture workforce digital capability framework was created to map the digital capacity of the agricultural workforce. The framework defines the future-required skills for the agricultural workforce as:

- digital capabilities including digital literacy, data management, digital communication, technology operation, data monitoring, analysis and interpretation, and incident management
- enabling capabilities including process improvement, collaboration, personal learning and mastery, business transformation, and critical thinking.³⁴

The 2019 Joyce review of the VET system noted the impact of new technology on changes in the skills needs of jobs in agribusiness and related industries. Technologies such as the internet of things, artificial intelligence, automation, digital twins, and robotics are already changing the nature of jobs and it is generally accepted that the pace of change is increasing. In addition to these new skills, many traditional skills are also likely to remain in demand in the future.³⁵

Operational Pressures

Diversification

The *Queensland Agricultural Snapshot 2018* indicates that agriculture businesses are diversifying to enhance business resilience.

Diversification strategies include:

- Diversifying agricultural operations and production approaches including operating both cropping and grazing, growing multiple fruit trees and/or nuts, and growing multiple vegetables, as well as:
 - o Organics and regenerative agriculture
 - o Bush Foods (Indigenous and traditional foods)
- Agritourism including farm stay, tours and events, collaboration with traditional owners, retail and dining
- First stage processing and processing of speciality products such as cheese, ingredients (flours), condiments and others
- Energy including bio-energy, solar farms, gas wells
- New markets including carbon markets
- New business models such as subscription models and cooperatives
- Off-farm income including women's off-farm income in family run farms

Diversification of agriculture businesses will require workforce planning to cultivate and attract a flexible and capable workforce with business and high level skills.

Farm size and consolidation

Queensland agriculture is dominated by small and family businesses. While a gradual decline of farm businesses has occurred (1.1% annually), the amount of land used for agriculture has remained constant.⁴⁰ This indicates that farm size is increasing most likely due to consolidation. Farm size can contribute to diversification and competitiveness. About 29 per cent of farms in Queensland had an estimated value of agricultural operations (EVAO)⁴¹ between \$50,000 and \$150,000. These farms accounted for four per cent of the total value of agricultural operations in 2017-18. In comparison, 18 per cent of farms in the state had an EVAO of more than \$1 million and accounted for an estimated 62 per cent of the total value of agricultural operations in Queensland in 2017-18.⁴²

The *National Agricultural Workforce Strategy literature review* notes the underlying trends that were changing the size and nature of the agricultural workforce:

- aggregation of farms
- intensification of production
- gentrification
- corporatisation.

Economies of scale, increased productivity due to technology, and competition for labour with other sectors identified as drivers of the overall reduction in farm numbers and increase in farm sizes, often resulting in corporatisation. Farm aggregation and corporatisation has resulted in more reliance on labour from outside the family unit, in turn increasing demand for qualifications, training, and higher skill jobs such as leading farm hands, supervisors, and orchard managers.⁴³

Social licence

Agriculture depends on social licence to operate successfully. A social licence refers to the acceptance granted to a company or organisation by the community based on its social relationships and responsibility.⁴⁴ The agriculture industry is responding to societal expectations of responsibility and sustainability by engaging in animal welfare practices, fair work, water management, conservation and land management, cultural heritage management, reconciliation, and regenerative agriculture. Among a range of credentialing and certification initiatives, the Fair Farms initiative addresses fair and responsible employment practices in horticulture.

The RJSA's submission to the *National Agricultural Workforce Strategy* suggests that social licence provides opportunities for the agriculture industry and that industries that anticipate social licence issues have the ability to position themselves as drivers of change for good rather than clinging to practices which have lost public support. The social licence can also be attractive to workers who seek social purpose and fair conditions in their employment.

Legal and regulatory requirements

Evolving regulations from all levels of government are placing more pressures on the farming community. The *National Agricultural Workforce Strategy* notes that new commercial customer requirements and government regulations require farmers and employees to be educated and trained to understand and satisfy these requirements. In turn this will ensure agribusinesses and the wider agricultural sector maintains and improves its competitiveness as clean, green, and safe.

The Productivity Commission report, *Regulation of Australian Agriculture*, found that regulations applying to agriculture were "vast and complex".⁴⁵ Regulation is applied at every stage of the agricultural supply chain. In submissions to this report, one agriculture business reported that it complies with, or takes account of, over 300 Acts, regulations and codes. The agriculture industry acknowledges the benefits and necessity of regulation, which can enhance the reputation of Australian agriculture. However, a level of extraneous administration was identified in relation to various permits and reports that often impacted negatively on agriculture businesses, such as fees as well as processing and approval delays. Because of the breadth of regulation, contradiction and repetition was also identified. As regulation is regularly reviewed and reformed, knowledge of and the ability to navigate these regulatory landscapes is an integral for the effective operation of an agriculture business.

The *National Agricultural Workforce Strategy* suggests that workforce development is not only required for commercial reasons – roles such as auditors and compliance officers are also becoming increasingly critical. Achieving compliance requires workers in the supply chain to be skilled in certification, monitoring, record-keeping, labelling, quality assurance procedures, and auditing.

Workforce demographics

The combination of workforce demographics and broader population dynamics has resulted in significant challenges in relation to attracting and retaining workers to the industry and to regional areas. Diverse workforces have benefits for industries and there are indications that women, young people, migrants and Aboriginal and Torres Strait Islander people are not well represented in the workforce. Queensland has an annual population growth rate of 1.6 per cent in 2019-20 with most people relocating to capital cities and urban centres.

The agriculture workforce has the highest average age of any industry in Queensland and this is compounded by regional demographics. Regions outside of South East Queensland demonstrated a high proportion of residents aged over 65 years (17.2 per cent) and aged 45-64 years (26.1 per cent) than South East Queensland. In South East Queensland, the population aged over 65 years was 15.1 per cent and aged 45-64 years was 24.1%.⁴⁶ Acknowledging that regional populations are smaller than South East Queensland, this indicates a significantly smaller and ageing labour pool.

The sector continues to raise concerns about the impact of the ageing workforce and upcoming retirements on both labour supply and skills. Workforce planning will play a pivotal role in planning for future skills needs and supporting the ageing workforce as they transition to retirement through succession planning.



Supplied by Growcom, participants from the Growcom, Queensland Government funded, Skilling Queenslanders for Work program.

Workplace practices

Workplace Health and Safety

The farming community faces a range of workplace health and safety (WHS) issues from vehicle accidents to mental health, compounded by isolation and often limited access to medical services. The physical nature of much of the work has an impact on the agriculture workforce. The sector has the highest fatality rate of any Australian industry (9.1 fatalities per 100,000 workers in 2019).⁴⁷

Safe Work Australia identifies agriculture as one of the most dangerous industries to work in due to the combination of hazards including plant, chemicals, noise, dust, sun exposure, working with animals as well as the fact many in the industry work alone or in remote locations, highlighting the need to improve skills and capability in WHS in the industry.⁴⁸



Safe Work Australia identifies agriculture as one of the most dangerous industries to work in due to the combination of hazards including plant, chemicals, noise, dust, sun exposure, working with animals as well as the fact many in the industry work alone or in remote locations.

A photograph of an orange grove. A person wearing a blue long-sleeved shirt and dark gloves is visible on the right side, reaching into the branches. A large, light-colored woven basket is suspended from a wooden ladder or branch. The basket is filled with several ripe, bright orange fruits. The background is filled with dense green foliage and more oranges hanging from the trees. The lighting is bright, suggesting a sunny day.

PART 3

KEY INDUSTRIES AND WORKFORCE ISSUES

PART 3: KEY INDUSTRIES AND WORKFORCE ISSUES

Queensland's largest agricultural industries, measured by estimated GVP are meat products, horticulture, sugar cane and cereals, and cotton. Other industries of significance to agriculture in Queensland are pork, dairy and poultry and the emerging sector of aquaculture. An overview of each sector and commentary about current issues and workforce impacts is outlined below.

Beef cattle, sheep and grains

Queensland is Australia's main producer and exporter of beef, with almost half of the nation's herd. There are more than 11,600 specialist beef enterprises with beef cattle grown across most regions of the state. The principal regions in Queensland where cattle are produced are Fitzroy, Desert Channels, North Queensland Dry Topics, and the Murray Darling Basin.⁴⁹ The sector advises it provides direct employment for approximately 40,000 people in Queensland.

Sheep farming has been a staple of Queensland's primary industries since the 1840s. Queensland's current sheep belt covers an area of about 55 million hectares. Lambs for the meat trade are raised mainly on crop farms on the Darling Downs. Mutton sheep are usually culled from wool-growing Merino flocks. Wool production per head varies considerably between and within districts.

Over the worst years of the Queensland drought and wild dog problem, many sheep farmers either switched to other commodities like beef or left the sector. Since the expansion of cluster fencing and the improved seasonal rainfall in recent years, sheep farming has increased in most of the traditional sheep areas of the state. The wool sector is also making a slow comeback in Queensland with a subsequent increase in need for shearing and shed staff although this has been met to date by contractors and returning workers.

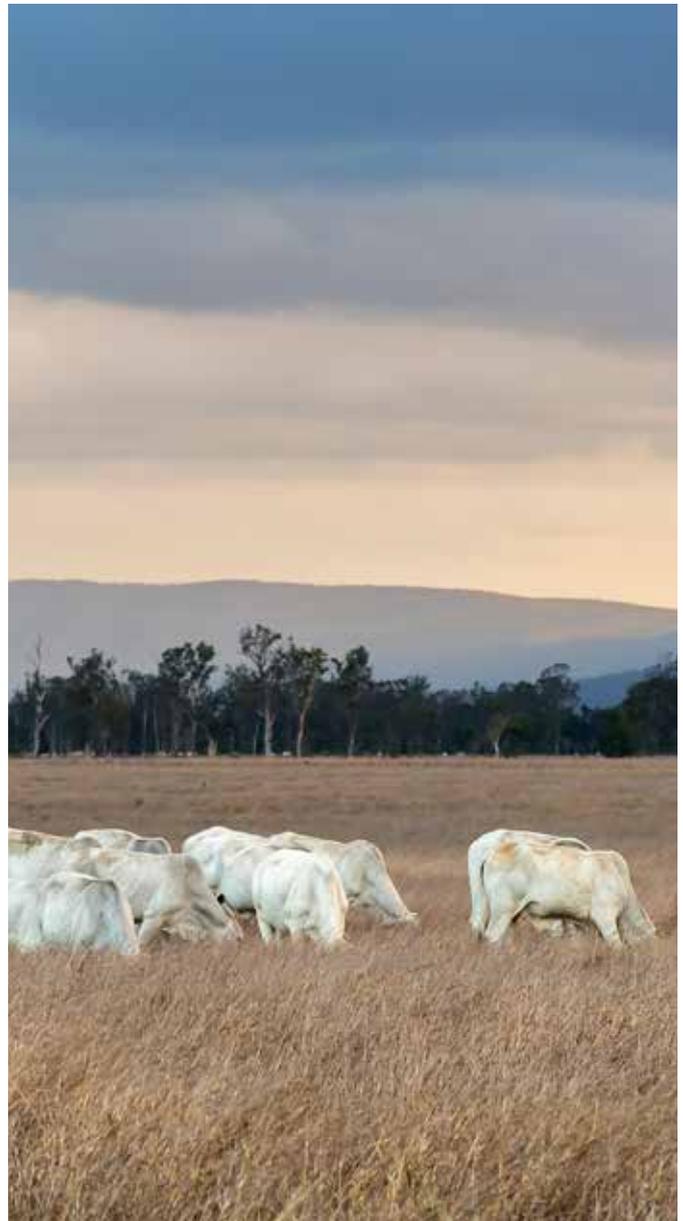
Queensland grows approximately one third of the nation's grains. The grain sector is increasingly becoming a professional, quasi corporate environment, and while direct jobs on farms may have decreased, new non-traditional agricultural jobs such as automation technicians, programmers, data analysts, agronomists, and precision advisers are on the rise.

Labour trends in the beef sector identified in the *National Agricultural Workforce Strategy* include efforts to keep labour within the family unit, northern Australia employing staff on an ongoing basis, and a high turnover due to isolation. For the sheep sector, there is limited mechanisation, with the main issue being shearing which has a long history of competition between capital and labour. Further the shift to sheep meat production reduces the importance of shearers.⁵⁰

AgForce advises of a real challenge in continuously re-employing workers for the northern beef season, due to high turnover or non-returnees as well as lack of training options resulting in higher WHS incidents and injuries. The perceived lack of options for training is considered by the sector to be contributing to a tension between getting people work ready and getting them employed.

Corporate cattle businesses have induction training for WHS, first aid and other skills, but follow up and continuing training is more difficult to deliver. AgForce considers the opportunities for employment growth are good because there is a shortage of staff. Finding ways to recruit, train and retain staff could have significant positive growth for employment in the northern cattle sector as well as the slowly recovering sheep sector. There is also a challenge for RTOs because few have sufficient resources to assist beyond niche courses.

According to AgForce the grain sector's main workforce challenges are access to labour with competencies in monitoring highly complex and expensive machinery and mechanics and service people. There are opportunities for employment growth in technology-based servicing. Skilling staff with the ability to monitor complex equipment and effectively problem-solve when needed are considered the main areas of future workforce development and training.



Horticulture - fruit and nuts, vegetables and nurseries

Horticulture is Queensland's second largest primary sector. Fruit and nuts are Queensland's largest horticultural sector, followed by vegetables, and then production nurseries, turf, and flowers and foliage. According to Growcom, the fruit, nut and vegetable sector is worth more than \$2.8 billion per year, employing approximately 25,000 people and growing one-third of the nation's produce.

Queensland AgTrends figures put the production nursery, flowers and foliage, and turf industries' value in excess of \$1.5 billion per year.⁵¹ More than 7000 people are estimated to work in this sector. The bulk of Queensland nursery, flower and foliage, and turf production is undertaken in the southeast corner with an estimated 70 per cent of all greenlife produced between Noosa and the New South Wales border and west to Toowoomba. It is almost entirely produced for domestic sale with significant volumes sent to other states.

The horticulture sector relies on a combination of skilled and unskilled workers. The fruit, nut and vegetable harvest workforce is highly mobile, moving across the country in line with harvest season and it can be challenging for the sector to attract local labour (and/or displaced workers), despite attempts to source both local job seekers and other Australian labour. Growcom advises that the fruit, nut, and vegetable sectors heavy reliance on casual employment has

a negative impact on workforce efficiency due to the high costs of training and administration from high staff turnover. Growers often rely on casual labour hire which has limited ability for new entrants to gain training. The inability to attract workers can result in lost crops and the Lost Crop Register was set up by Growcom for farmers to report their losses.

Due to a lack of supply of skilled and unskilled Australian job seekers to meet production horticulture's seasonal employment needs most unskilled, seasonal work is undertaken by WHMs. When appropriately qualified local workers are unavailable the PLS and SWP are used to meet seasonal and ongoing unskilled and semi-skilled vacancies. The remainder of horticultural positions are normally filled by Australians. Often these positions are semi-skilled and management positions. The workforce in the nursery, flower and turf sectors on the other hand are predominantly Australians who live nearby. Nursery and Garden Industry Queensland advises that a large part of the workforce is casual rather than seasonal and that skilled staff are in high demand. The effects of COVID-19 on the agricultural workforce have been most directly felt in the fruit, nut, and vegetable industries which have significant links to the tourism industry, providing income for backpackers and grey nomads every year.



Fruit, nut and vegetable sector is worth more than **\$2.8 billion** per year



Employing approximately **25,000** people



Growing **one-third** of the nation's produce



Other crops



Sugar cane

Sugar cane is grown along the east coast from Grafton in New South Wales to Mossman in Far North Queensland, with 95% of Australia's raw sugar being produced in Queensland's 21 sugar mills. Australia's approximately 4,000 cane farming businesses grow 30-35 million tonnes of sugar cane each year. The Australian Sugar Milling Council reports that the nation's 24 sugar mills process the cane into 4 to 4.5 million tonnes of raw sugar a year and 80 per cent is exported through six bulk storage ports. Australia is currently the second largest exporter of raw sugar onto the world market.

Sugar cane and its by-products are also used in the energy markets with cogenerations and ethanol production replacing fossil fuels.

The sugar cane price is directly linked to the volatile world sugar price. Forward pricing is a mechanism through which growers can manage the risk of price fluctuations. QFF has identified the need for improved forward sugar pricing skills; enhancing these skills can improve business decision making and marketing.

Sector groups advise that it struggles to attract haul out drivers every year and there is a need for more technical advisors. The sugar cane sector also has an older workforce, and succession planning is an issue.

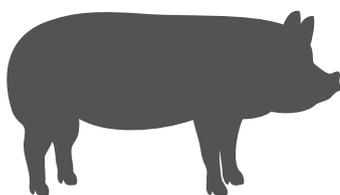
Cotton

Australian cotton is in high demand and can attract a price premium due to its high-quality characteristics, reliability, and a proven track record in meeting manufacturer and consumer needs. Queensland farms represent 40 per cent of Australia's 1200 cotton growers. They are mostly located in central and south western Queensland. The cotton growing season lasts approximately six months, starting with planting in September/October and ending with picking in March/April.

More than 99 per cent of planted cotton in Australia uses biotechnology. The Australian Cotton Industry Sustainability Report 2019 published a 97 per cent reduction in insecticide use and a 48 per cent improvement in water use efficiency since 1992.

Crop sectors are most successful at substituting labour with technology. There is high labour peak at harvest which is often filled by family and longstanding relationships. Because these sectors also regularly use skilled consultants, there is a need for highly skilled service providers and professional services.

Intensive animals

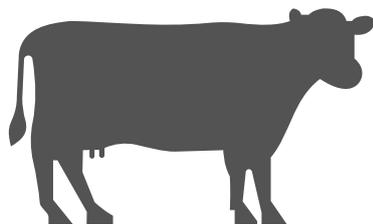


Pork

Queensland has around 22.4 per cent of the national pig herd with 61,624 sows and approximately 280 commercial herds with sows. Most pork production is for the domestic market. In 2014-15, approximately 1.1 million head were slaughtered in Queensland producing 87,191 tonnes.

Pig production in Queensland is located close to grain growing areas. The Darling Downs has 56 per cent of the state's total pig herd, followed by Wide Bay with 30 per cent and the Fitzroy region with 9.5 per cent of the herd. The pork sector is also exposed to biosecurity risks, such as various strains of swine flu, that producers must manage.

Australian Pork Limited (APL) investigated national labour issues in the sector as chronic shortages can result in lower pig productivity, risk to occupational health and safety and an impact on pig welfare. APL surveyed producers who also cited declining local populations (40 per cent) and the lack of available skills and development training (25 per cent), respectively, as leading causes of the skills shortage in the Australian pig sector. The pork sector is reliant on skilled overseas workers on temporary visas.

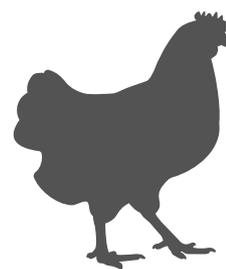


Dairy

Queensland dairy produces more than 300 million litres of milk annually from 70,000 cows on approximately 300 farms located throughout South East Queensland, Darling Downs, Wide Bay, Central Queensland around Monto, Rockhampton, and Eungella, and in Far North Queensland near the Atherton Tableland.

The sub-tropical dairy region, which is comprised of dairy in northern NSW, SEQ, central Queensland and FNQ, produced approximately 486 million litres of milk, representing about 5.5% of national milk output in 2018-2019.

Most dairy production in Queensland goes directly into providing fresh white milk, almost all of which is consumed within the state.



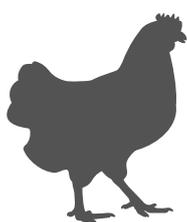
Poultry and eggs

Queensland's poultry production is supplied by approximately 90 farms, 90 per cent of which are located in the state's south east. Queensland chicken meat production accounts for 21 per cent of overall national production. Chicken meat growing farms are generally located within 200km of a processing plant, minimising transport stress on the chickens on the day of processing. Growers need to be near a feed mill, with guaranteed water, power, and access for trucks, as well as access to labour and services.

The relatively low cost of chicken comparative to other meats is expected to continue to drive consumption and sector growth. Chicken is the most consumed meat in Australia, with population growth the key driver in the growth of the sector.

Business Queensland reports that the state's egg sector is an important and growing intensive animal farming that employs over 550 people and has a gross value of production of \$202 million (2014-15 figures). Queensland is the second largest producer of eggs in Australia, producing over 25 million eggs per week, or about 28% of the nation's eggs.

The relatively low cost of chicken comparative to other meats is expected to continue to drive consumption and sector growth. Chicken is the most consumed meat in Australia, with population growth the key driver in the growth of the sector.



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Gross value of production of
\$202 million

Queensland is the second largest producer of eggs in Australia

Emerging sector

Aquaculture

Aquaculture is an emerging sector in Queensland, with significant increases in production across the prawn, redclaw and freshwater fish sectors contributing to a 39.3 per cent increase between 2013-14 and 2019-20.⁵⁹ Increased consumer demand for Australian-produced seafood is driving sector growth and creating opportunities to integrate production from the hatchery through to consumers.

In Queensland the prawn farming sector is the largest employer with 66.0 per cent of the sector's total labour force.⁶⁰ There were 418 registered aquaculture authority holders in 2019-20 with the majority of production in Cairns, Townsville, and Mackay.⁶¹

Of major consideration for Australian aquaculture is its ability to make its end product affordable and economical, both domestically

and internationally. The cost of production can be relatively high compared with other countries. Advanced techniques and technologies have the potential to reduce the costs of seafood produced by Australian aquaculture, making it increasingly more competitive for consumers.⁶²

Aquaculture forms a critical element of the future of global seafood supply and is the fastest-growing food sector in the world, already a \$243.5 billion sector and in 2018 provided 52 per cent of seafood for human consumption.⁶⁴ As demand for seafood continues to rise and wild-caught fisheries reach ecological sustainable levels, any substantial growth in seafood production will need to be driven by aquaculture.⁶⁵



Supplied by Pacific Reef Fisheries

Labour and skills shortages

The RJSA's submission to the *National Agricultural Workforce Strategy* confirms that labour concerns are among some of the top challenges that farmers report. The causes of labour shortages are complex and varied across industries and geographical areas. As well as seasonal labour needs, agricultural industries will increasingly need skilled workers. The QFF advises that as well as production horticulture workers, there are major shortages for farm supervisors across the sector, technical roles and agronomists.

Queensland AgTrends forecasts suggest that labour shortages in production horticulture may be up to 20 per cent of total labour demand, with small to medium sized producers more affected.⁶⁶ Latest DAF modelling shows the average monthly casual and contract labour demand in all horticulture is between 15,000 and 18,000 full-time equivalents.⁶⁷ Most of these available opportunities were located across many regional areas of Queensland with roles

available for both skilled and unskilled workers. Horticulture in Wide Bay Burnett, Moreton Bay-North, and Cairns regions have the highest demand for workers with estimated monthly job averages of 2860, 1830, and 1420 respectively. Other areas of high average monthly demand in horticulture include Mackay-Isaac-Whitsunday, Toowoomba, and Darling Downs-Maranoa.

The National Lost Crop Register was launched by Growcom in December 2020 to quantify the true cost to industry and the national economy from a lack of seasonal workers available to harvest fresh fruits and vegetables.

Identified shortages for agriculture-related occupations as reported in *National Agricultural Workforce Strategy* literature review are shown in Table 6.



Table 6: National skills shortages

Source: Department of Agriculture, Water and the Environment, 2020, National Agriculture Workforce Strategy literature review

Regional	agricultural technician
	mixed livestock farmer
	turf grower
	beef cattle farmer
	fruit or nut grower
	livestock farmers (other)
	pig farmer
	cotton grower
	poultry farmer
	wool buyer
	crop farmers (other)
	grain, oilseed or pasture grower
	mixed crop or livestock farmer
	shearer (494 ROL)
	stock and station agent (494 ROL)
	wool classer (494 ROL)
	dairy cattle farmer
mixed crop farmer	
sheep farmer	
sugar cane grower	
Medium and long-term strategic skills	agricultural consultant
	agricultural engineer
	agricultural scientist
	veterinarian
Short-term skilled	flower grower
	vegetable grower
	veterinary nurse

The National Skills Commission's Skills Priority List identifies ANZSCO occupation shortages in agriculture at the national and state levels.⁶⁸ At June 2021, these include:

- **Occupations in shortage with strong future demand** – agriculture consultant, agriculture scientist, veterinarian and agricultural, and horticultural mobile plant operator
- **Occupations in shortage with moderate future demand** – agriculture technician, farrier, and nurseryperson
- **Occupations in shortage with soft future demand** – mixed crop farmer, pig farmer, grape grower, and poultry farmer
- **Occupations not in shortage with moderate future demand** – land economist, environmental consultant, fisheries officer, and blacksmith
- **Occupations not in shortage with soft future demand** – aquaculture farmer, cotton grower, flower grower, fruit or nut grower, grain, oilseed or pasture grower, turf grower, vegetable grower, apiarist, beef cattle farmer, dairy cattle farmer, deer farmer, goat farmer, horse breeder, mixed livestock farmer, sheep farmer, and mixed crop and livestock farmer

Other occupations identified in the *Skills Priority List* include technical and service providers to agriculture such as software developers, engineers and trades.

An RJA survey identified the top skills needed Queensland wide, other than previous experience and a good work ethic, were:

- machinery skills including maintenance, welding, and fabrication
- information technology and computer literacy
- driving skills including truck, forklift and tractors
- managerial and supervisory skills
- appropriate licences.

The RJA proposes that the current ANZSCO Skilled Occupations List has continued to be a disadvantage, because roles listed on the ANZSCO either do not exist or do not match and represent industry needs.⁶⁹ They propose the codes are reviewed to better reflect the scope of skills required in the agriculture industry. In particular, RJA recommends that the Agriculture, Forestry and Fisheries scope be reviewed; as in the definition it excludes occupations involved in turning 'primary products' into 'secondary products'. As the agriculture industry grows, it will be useful to widen or adjust this scope i.e. Production versus manufacturing.

Other occupations identified in the Skills Priority List include technical and service providers to agriculture such as software developers, engineers and trades.

PART 4

**GROWTH,
OPPORTUNITIES
AND WORKFORCE
FOCUS AREAS**



PART 4: GROWTH, OPPORTUNITIES AND WORKFORCE FOCUS AREAS



Regions across Queensland are increasingly looking to the agricultural industry and its supply chain for economic growth and employment opportunities. Many of these regions also rely on industries such as tourism and mining which often compete with agriculture for workers in terms of both supply and wage rates.

The industry's strategy for growth relies on anticipating, creating, and responding to consumer demands that have the potential to increase its competitiveness. Understanding changing social expectations and adapting to keep up with contemporary practices will require a culture of continuous improvement. The CSIRO suggests that changing demands across the agricultural workforce could potentially attract a new generation of graduates with a diverse set of technical skills, as well as soft skills such as the ability to collaborate and solve problems. The future viability of the industry will depend highly on its ability to embrace innovation, technology, and change, as well as to promote agriculture as an attractive career for young people.⁷⁰

Success is very much underpinned by a need for the industry to adopt new technology and adapt to new ways of learning as well as its ability to attract new and different talent with the skills needed and the interest in living and working in regional and remote areas of the state.

Economic outlook

COVID-19 is expected to continue to affect agricultural supply chains – including international trade and on-farm labour supply – and consumer demand for agricultural products. Demand for most products will remain below pre-pandemic levels because of lower incomes, decreased consumer confidence, and higher unemployment. Consumer habits will normalise with more retail expenditure and a preference for staples and long-life products but lower expenditure on high-value products and restaurants.⁷¹

Agricultural trade is forecast to remain stable as bulk commodities are transported via shipping, which has been less disrupted than other forms of transport such as airfreight. Total Queensland agriculture production is forecast to increase by five per cent from 2019-20 to 2020-21, with volume increases expected for cotton and other field crops and decreases in livestock production.⁷²

Employment

Projected employment growth in AFF is positive with Jobs Queensland *Anticipating Future Skills* projecting growth of 2.3 per cent in AFF employment from 2020 to 2024. Jobs Queensland regional employment growth projections from 2020 to 2024 in aquaculture and the agriculture industries of nursery and floriculture production; mushroom and vegetable growing; fruit and tree nut growing; sheep, beef cattle and grain farming; and other crop growing are shown in Figure 8.

Aquaculture was projected to increase by 10 times that amount. Consequently, those regions with a higher level of aquaculture will experience significant employment growth. Mackay-Isaac-Whitsundays is the highest growth region in the sector with a forecast increase of 223 jobs between 2020 and 2024.

While there is very limited current data for Queensland, Figure 9 provides an indicative forecast of shifts in workforce composition for AFF as the number of owners and operators decrease and demand for managers and paraprofessionals increase. This will reflect the need for deeper knowledge and higher level skills in critical areas, such as, water management and irrigation, sustainable practice, precision agriculture, animal performance, breeding and nutrition.⁷³ Paraprofessionals undertake some aspects of skilled professional roles but are not fully qualified professionals.

Figure 8: Regional employment growth projections for selected agricultural industries, Queensland, 2020 to 2024 (%)

Source: Jobs Queensland, 2020, Anticipating Future Skills

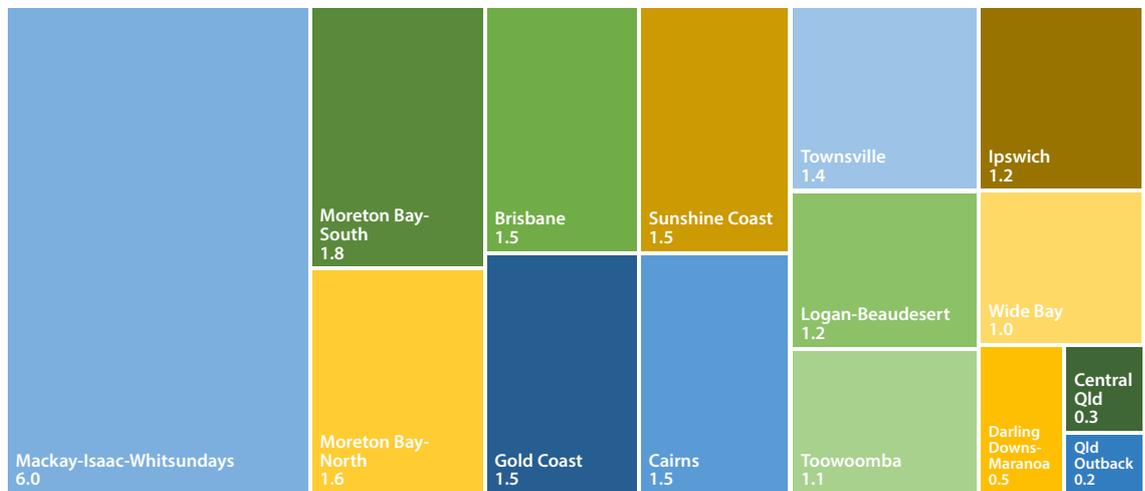
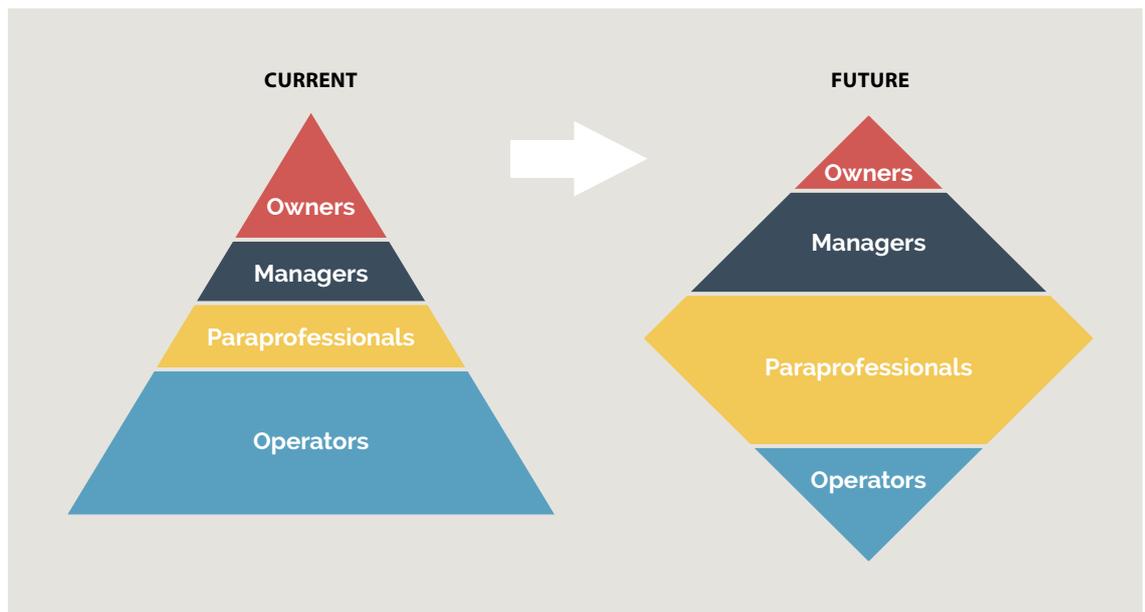


Figure 9: Projected agriculture workforce composition

Source: AgriFood Skills Australia, 2015, What lies beneath



Demographics

The ageing agricultural workforce combined with the need to adapt to emerging technologies and work practices presents opportunities to attract more young people into jobs in the sector.

The under-recognition of the contribution of women in the sector also indicates there is need to redefine gender roles in the rural landscape. QFF's *Cultivating Farming Women's Management and Leadership Skills* research project found that to better service

agricultural enterprises, business programs need to focus on supporting the process of renewal for mature businesses and, in particular, supporting the women driving this process.

Building on successes in bushfoods and cattle, opportunities exist to attract more Aboriginal and Torres Strait Islander people into a variety of roles as well as develop Aboriginal owned and operated agribusinesses.

Education and training

Jobs Queensland AFS data projects the change of employment by qualification level for selected agricultural industries in Queensland between 2020 and 2024 will decrease by 26.6 per cent for Certificate I and II and an increase for all other qualification levels. The highest increase is expected for tertiary level qualifications – Post Graduate Degree (18.7 per cent), followed by Bachelor Degree (10.5 per cent), and Graduate Diploma and Graduate Certificate (8.9 per cent), as shown in Figure 10.

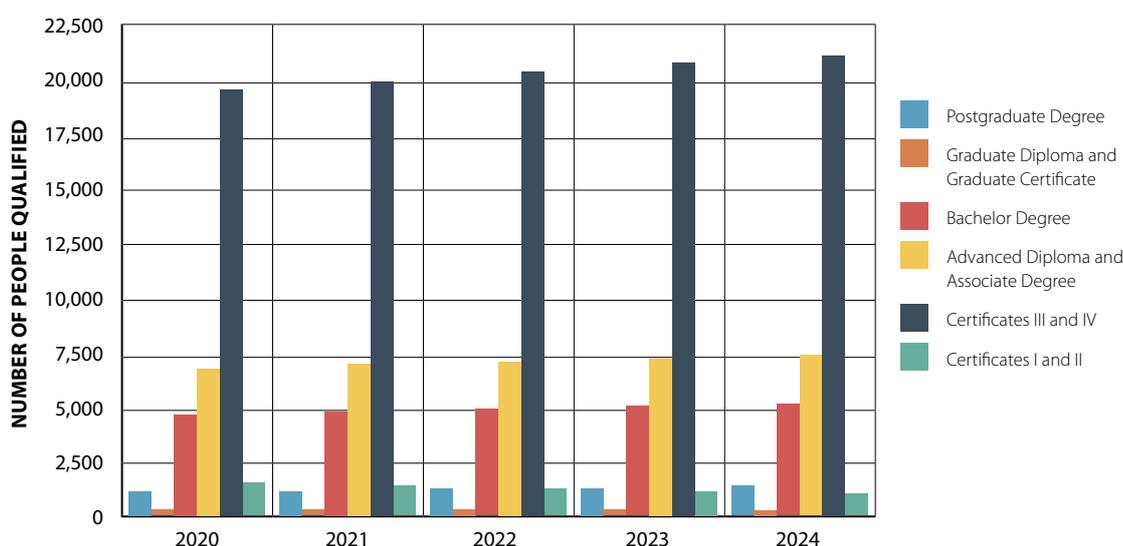
The RJSA's submission to the *National Agricultural Workforce Strategy* notes there is a growing professionalisation of roles to support the changing nature of modern farming businesses. Further, expectations on what is required of those who wish to enter agriculture as a career and maintain their employment have shifted towards higher-skills and specialisation. The QFF suggests that technological change will increase the demand for more professional and technical jobs in the sector. Predicted future skill needs include those of other occupations not traditionally associated with agriculture including engineers, data analysts, and business support services.

Agricultural businesses advise they are looking for workers who have experience, relevant skill sets, and demonstrated capabilities, rather than focusing on full qualifications. This is reinforced in the RJSA submission to the *National Agricultural Workforce Strategy*, which says training needs to promote reskilling and continuous learning in the workplace with a preference for micro-credentialing and stackable credentials that may over time lead to a qualification for individual workers. Work based training is currently a model that could help business provide a path to new entrants and to fill skills needs. Lack of effective industry led programs that partner with the training sector to deliver target solutions and use credible industry experts.

There is also a need to improve accessibility and affordability of relevant training and skills development programs for farming women and to remove the barriers to access subsidised training courses. For example, subsidised training is often restricted to those who do not hold any qualifications.

Figure 10:
Selected agricultural industries forecast of employment by qualification level, Queensland, 2020 to 2024

Source: Jobs Queensland, 2020, *Anticipating Future Skills*



Agricultural businesses advise they are looking for workers who have experience, relevant skill sets, and demonstrated capabilities, rather than focusing on full qualifications.

Employment opportunities

Nationally, Food Innovation Australia identifies 16 major opportunities that could unlock \$97 billion and create 147,000 jobs with potential economic gains to \$136 billion and 595,000 jobs by 2025⁷⁴. While this would leave the industry's overall workforce profile largely intact, there would be a slight decline in managers and farm labour offset by a small increase in professional and technical workers.

The report predicts that demand for people with technical, managerial, and numeracy skills will grow the strongest and that manual labourers, such as farmhands and administrative workers are expected to require the largest change in skills to do their jobs in 2025. It proposes some workers would be introduced to new technologies while others would be given new roles. The workforce would need substantially stronger technical skills (+21 per cent) by 2025 to facilitate the sector's growth and competitiveness.

Managerial skills (+ eight per cent) and numeracy (+ seven per cent) were also becoming more important. Demand for certain occupations could still vary significantly in specific fields. For example, for Australia to realise the full opportunity presented in the field of precision agriculture, a workforce comprising 70 per cent professional staff and six per cent sales workers by 2025 would be needed. In contrast, Australia's opportunity to support a global supply chain transformation would require only nine per cent professional staff and 45 per cent sales workers.

Figure 11 shows the 16 opportunities identified by Food Innovation Australia addressing critical issues such as food security and sustainability, enhanced production and value addition, global markets and future consumer behaviours.



Supplied by Pacific Reef Fisheries

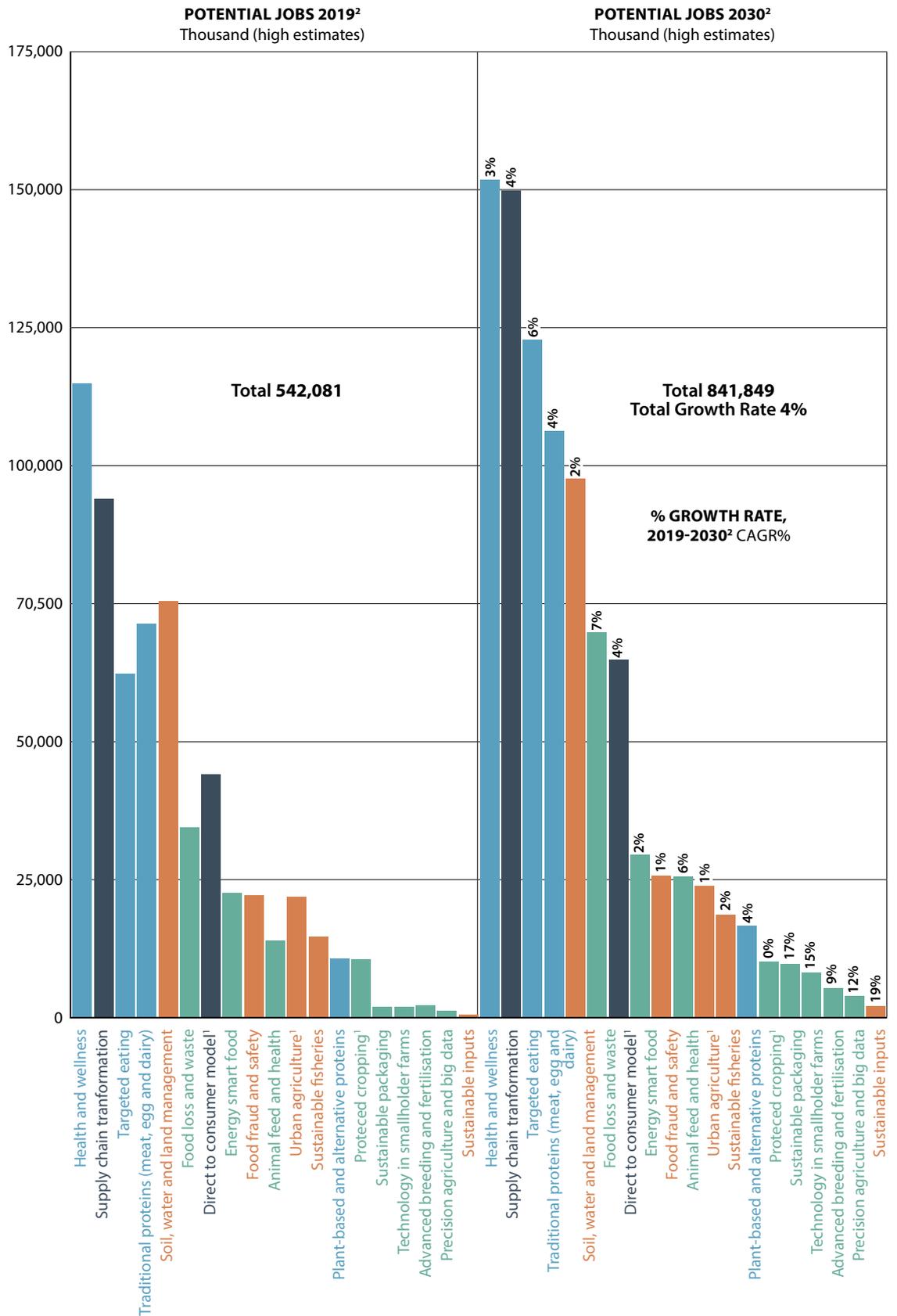
Figure 11: Potential jobs growth in the AgriFood industry⁷⁵

Source: Literature search; AlphaBeta analysis

1. This summation does not include 'Urban agriculture', 'Protected cropping' and 'Direct to consumer model' to avoid potential overlaps.

2. The 2019 job estimation comparison is not the current job estimate for Australia but rather the potential opportunity from full exploitation of all the identified opportunities.

- Food security & sustainability
- A global marketplace
- Enhanced production & value addition
- The future consumer



Focus workforce planning areas

To date, workforce planning in the agriculture sector has been led by specific commodities. While commodity-based approaches focus on a single commodity across multiple regions, regional approaches for the sector offer a cross-industry workforce understanding. This centres on the factors affecting workforce attraction and retention for that community, which better suits agriculture because it is predominantly located in rural and regional areas where attraction and retention of workforce is significantly influenced by local factors.

A regional approach, focused on place-based strengths and opportunities, in Queensland could enable significant economic and workforce development strategies by addressing labour needs across industries. The RJSA's submission to the *National Agricultural Workforce Strategy* proposes that a regional approach could create a pool of labour for a region, thereby using skills across industries rather than creating competition between industries. Regional networks, state government and local authorities play an important role in attracting and retaining workforce through a range of policy, land use, infrastructural, educational and industry relations initiatives. For example, in the Communities in Transition pilot program, the State Government worked with communities across Queensland to develop transition roadmaps that seek to expand and diversify economic activity while retaining and attracting skilled workforce, charting pathways to zero net emissions, and addressing, in some areas, population decline.⁷⁶ The vision for Ag2030 projects that the agriculture industry "are supported by vibrant rural and regional communities".⁷⁷

Industries such as construction have adopted a more regional approach to workforce planning, which has provided various benefits by creating community-based solutions. Participation from industry representatives, key influencers, and local government is critical to the success of place-based planning. This will build on the work of the Queensland Agricultural Workforce Network (QAWN) which plays a vital role in encouraging, placing, and keeping Queenslanders in agricultural work.

Priority sectors for place-based workforce planning in Queensland, based on GVP and employment growth are:

- **Grazing** - beef cattle and grains
- **Horticulture** - fruit and nuts, vegetables, and nurseries
- **Crops** - sugar and cotton
- **Emerging** - aquaculture.

The Queensland-specific action areas identified by the sector include:

- **Adaptability** – developing entrepreneurship and business capability for innovation and adaptation to change
- **Attraction and diversity** – developing a diverse and inclusive future agriculture workforce
- **Retention** – developing agriculture careers and opportunities and becoming employers of choice
- **Skilling** – developing future workforce skills in agriculture

Adaptability and business capability

The ability of agribusinesses to innovative and adapt to change is critical for the industry's prospects. The *National Agriculture Workforce Strategy* stresses the need for agribusinesses to orient to the future. The Strategy states that Australian agribusinesses are at risk of falling behind by relying on business as usual in an increasingly competitive market. As agribusinesses modernise, they will also need to adopt a lifelong learning mindset as well as adopting business case skills to support decision making about new methods and technologies. However, this can result in other stresses in agribusiness owners such as learning fatigue.

The composition of agriculture and its workforce has changed and continuously evolves and this poses challenges for agribusinesses. The growth of Agricultural technology, or Agtech, is key is evolution and is fast becoming a vital part of the industry. Other specialisations are emerging, including alternative proteins, energy production, composite and organic products, agritourism, which all necessitate business development.

Agribusiness owners and managers will need higher level skills in decision making and adaptive strategies. A skilled workforce needs skilled and flexible management, particularly as older workers retire. Additionally, agribusinesses will need to make decisions about service providers and consultants. The understanding and application of sound decision making will require higher skills in:

- the science of production, or need to engage advisors with this knowledge
- business transitions, business planning and workforce planning across all business sizes
- the need to be able to analyse financial documents and information
- resilience, adaptability, and flexibility
- the adoption of technology and automation
- increased use of best management and monitoring practices
- increased uptake of farm data, as well as weather and market information in decision making
- new models and understanding pertaining to debt management mechanisms
- management of pests and invasive species
- making advanced cropping decisions based on changing weather patterns and potentially lower water allocations.

Agribusinesses can also become more complex business operations through diversification and require additional business capabilities. In particular, banking and institutions are requiring increased levels of monitoring data pertaining to business risks and opportunities and risk management plans (as part of their Business Plans) from farmers when making applications and many farmers need upskilling to meet these requirements.

The growth of Agricultural technology, or Agtech, is key is evolving and is fast becoming a vital part of the industry. Other specialisations are emerging, including alternative proteins, energy production, composite and organic products, agritourism, which all necessitate business development.

Diverse and inclusive future agriculture workforce

The agriculture industry workforce is presently male-dominated and aging. However, women, Aboriginal and Torres Strait Islander people, young people and migrants all contribute to the industry. Attracting a more diverse and inclusive workforce can address issues of succession in the industry, as older workers retire. The current supply of suitably skilled agriculture workers (and farmers) is insufficient to replace the existing ageing and retiring workforce. The ability of the sector to work with schools and educational institutions to promote careers in agriculture and ensure that the workforce has the required skills, as well as an available pool of workforce such as immigrants is key to the sector's future.

The RJSA's submission to the *National Agricultural Workforce Strategy* notes that new employees are often ill prepared for the transition from school to employment because they lack the basic knowledge and understanding of work practices and culture. The foundations needed for working in the agriculture sector include language literacy and numeracy skills and WHS, combined with an understanding of the requirements of the job through work experience. When the labour supply does not meet agricultural needs due to the characteristics and perceptions of the work, such as the remote locations, casual nature of the job, physically demanding roles, and the need for flexibility in working hours, the sector becomes reliant on foreign workers to supplement labour requirements in peak periods.

Retention, agriculture careers and opportunities

The current workforce will need to engage in continuous learning to adapt to the evolving agriculture sector. It is likely that more and more of the workforce will require on the job training and to continuously update their levels of skills.

Transferable cross-sector skills will be critical for ensuring the workforce can adapt to the ever-changing environment. Creating career paths that encourage and enable people to progress to middle management positions may also contribute to attracting and retaining people in the sector. An opportunity for entrepreneurship to be embedded into training and the marketing of career pathways was identified by the RJSA VET Forum in 2018-19. Recognising the various roles of women in the agricultural sector and supporting their careers is an important component of future workforce planning and development.

There is also a need to work with the next generation of agricultural farmers and service providers to ensure they have the skills to be sustainable in the future. It is important that a culture of continuous improvement is supported to ensure that the next generation embraces technology uptake as part of everyday business.

Employment is not sufficient to retain skilled workers. Place also contributes to retention of workers in non-metropolitan regions. Access to a range of services, resources, amenities and opportunities can influence an individual's willingness to remain in a location for work.

Future workforce skills

The need for skill sets as a valued and funded pathway is commonly voiced by the sector. The primary industry skill sets currently funded under the Queensland Government's higher-level skills program are agricultural chemical, farm business management, irrigation contractor, irrigation installer, pressurised irrigation system operator, and technical skills for sport turf management. Training provision is not maintaining pace with agtech and innovation trends.⁷⁸

According to the *Agriculture, Horticulture, Conservation and Land Management IRC's 2019 Skills Forecast*, the top generic skills for agriculture are:

- learning agility, information literacy, intellectual autonomy, and self-management (adaptability)
- managerial and leadership
- financial
- technology
- science, technology, engineering, and mathematics (STEM) skills.⁷⁹

Results from the RJSA VET Forum in 2018-19 highlighted that training delivery and content needs to be:

- relevant and contextualised to the rural workplace with written information, work-based projects and the use of research and analytics to improve decision making and problem-solving
- practical and able to be incorporated into the real workplace
- industry driven or led and incorporate industry placements
- flexible, agile, and include non-traditional industry roles
- just in time, including micro-credentialing and skill sets
- assessed relevant to both current and future competency.

The forum identified a need for more qualified trainers and proposed that a pool of trainers could be established including experts or champions in the field.

Securing access to a readily available, flexible pool of local seasonal workers that can return in following seasons is important for industries such as cotton and horticulture. Funding for upskilling this highly mobile workforce in cross sector skill sets could potentially improve job opportunities across industries.

Management in agriculture will increasingly require knowledge of technology, regulation, markets, and the ability to lead and manage staff. In its submission to the *National Agricultural Workforce Strategy*, the RJSA says the level of skills of the future agricultural workforce will need to be higher and across multiple disciplines. It is expected that the greatest impact will be on enterprise owners, managers, and other decision makers, who will have a greater requirement to manage risk and develop strategies that are integral to sustainable growth and prosperity.

The four focus areas of adaptability, attraction and diversity, retention and skilling provide the basis for regional discussions to inform the development of an agriculture workforce plan for Queensland. These discussions will capture industry knowledge and identify solutions to shape the agriculture workforce plan that will include business capability needs, workforce, skills and training needs, and the strategies to build a sustainable workforce. The workforce plan will also provide an evidence base that informs future policy, industry programs, business and strategic decisions about the Queensland agricultural labour market.

APPENDIX 1

**EDUCATION AND
TRAINING IN DETAIL**



Higher education

Table 7: Undergraduate employment outcomes, by the agriculture and environmental study area and all study areas, Australia, 2019 and 2020 (%)

Source: Social Research Centre, Quality Indicators for Learning and Teaching, 2020 Graduate Outcomes Survey

In June 2020, as part of the Federal Government's higher education plan for producing graduates for high-priority jobs for growth sectors, the Minister for Agriculture, Drought and Emergency Management announced fees for students studying agriculture degrees would reduce by 62 per cent. This initiative is also aimed at lifting the education attainment for regional students.⁸⁰

COVID-19 has had a major impact on the Australian labour market, including graduate employment outcomes. Graduate employment rates have declined between 2019 and 2020 for agriculture and environmental studies and for all study areas, as shown in Table 7. There is no comparable study area for aquaculture in this survey.

Study area	Full-time employment		Overall employment		Labour force participation rate	
	2019	2020	2019	2020	2019	2020
Agriculture and environmental studies	72.6	67.4	89.1	84.4	92.7	93.6
All study areas	72.2	68.7	86.8	85.1	92.4	91.4

VET activity in Queensland

Table 8: AHC training package enrolments, total, government-funded, VETiS, Queensland 2016 to 2019

Source: NCVET, 2021, Australian VET statistics, DataBuilder 28 April

The most recently available NCVET data shows Queensland enrolments in the agriculture, horticulture, and conservation land management (AHC) training package decreased by 5455 (28.4 per cent) from 2016 to 2019 and government funded enrolments decreased by 2005 (19.2 per cent), as shown in Table 8. Total enrolments and government-funded and VET in schools (VETiS) enrolments all recovered slightly in 2019 after a four-year low in 2018. There were less than 85 enrolments per year in aquaculture qualifications (Seafood Industry training package) from 2016 and 2019.

Agriculture, horticulture, and conservation and land management enrolments	2016	2017	2018	2019
Total	19,235	17,735	12,825	13,780
Government-funded	11,015	9885	7985	9010
VETiS	3410	4370	2925	3065

VET and VETiS completions and enrolments for AHC training package in Queensland are presented in Table 9, showing an overall decline in both VET and VETiS enrolments and completions.

Agriculture, horticulture, and conservation	2016	2017	2018	2019
VET enrolments	17,245	16,035	11,625	12,570
VET completions	6,340	6,345	4,595	4,735
VETiS enrolments	2,755	3,320	2,190	2,210
VETiS completions	1,145	1,465	1,005	810

From 2016 to 2019 AHC enrolments were mostly male. More than half had successfully completed some form of post-secondary education, enrolments of Aboriginal and Torres Strait Islander Peoples increased each year, few spoke a language other than English at home, the majority were in major cities, followed by inner regional and outer regional, and enrolments in remote areas decreased.

In 2019, the greatest proportion of AHC enrolments were young people under 19 years (35.5 per cent), followed by people aged 30 to 39 years (16.4 per cent), 20 to 24 years and 40 to 49 years (both 14.9 per cent), 25 to 29 years (11.3 per cent), 50 to 59 years (9.8 per cent), and 60 and over (3.2 per cent).

The 10 most popular AHC qualifications delivered by Queensland schools in 2019 are shown in Table 10. Most popular was the Certificate II in Rural Operations, followed by Certificate II in Horticulture and Certificate I in AgriFood Operations. There were 35 VETiS enrolments in aquaculture qualifications in 2019.

Source: NCVET, 2021, Australian VET statistics, DataBuilder 12 July

**Table 10:
AHC VETiS
qualifications
by highest
enrolment,
Queensland,
2019**

Source: NCVET, 2021,
Australian VET statistics,
DataBuilder 28 April

Qualification	Enrolments
Certificate I in Conservation and Land Management	85
Certificate I in AgriFood Operations	395
Certificate I in Horticulture	50
Certificate II in Agriculture	250
Certificate II in Horticulture	525
Certificate II in Conservation and Land Management	120
Certificate II in Rural Operations	1160
Certificate III in Agriculture	285
Certificate III in Landscape Construction	60
Certificate III in Rural Operations	60

See Appendix 2 for details of the total and VETiS Queensland enrolments by AHC training package and aquaculture qualification.

Employers' use and views of the VET system

NCVER surveys all organisations in Australia with at least one employee⁸¹ as to their use and views of the VET system. Results are only available for AFF employers nationally as shown in Table 11, where they are compared with the results for all Queensland employers. Between 2017 and 2019, the proportion of AFF employers using the VET system, unaccredited training, and informal training in the past 12 months decreased while the proportion of employers providing no training had increased.

In relation to use of the VET system and unaccredited training in the past 12 months, the proportion of AFF employers with apprenticeships and traineeships had increased in 2019 and the use of nationally recognised and unaccredited training both remained stable, while vocational qualifications as a job requirement decreased.

In 2017 and 2019, AFF employers were very satisfied with training as a way of meeting their skill needs. Sector satisfaction with apprentices and trainees increased significantly from 2017 to 2019 but decreased for nationally recognised training.

**Table 11:
Employers' use
and views of
the VET system,
by employer
characteristics,
2017 and 2019
(%)**

Source: NCVET, Employers' use and views of the VET system 2019

Employer characteristics	2017	2019	2017	2019	2017	2019	2017	2019
Use of training in the last 12 months by employer characteristics								
	Employers using the VET system		Employers using unaccredited training		Employers using informal training		Employers providing no training	
AFF nationally	38.2	35.2	43.0	41.6	75.8	70.6	15.2	20.5
Queensland	54.5	53.2	51.4	49.9	81.0	76.0	9.5	10.9
Use of the VET system and unaccredited training in the last 12 months								
	The VET system							
	Employers with vocational qualifications as a job requirement	Employers with apprentices/trainees	Employers using nationally recognised training	Employers using unaccredited training				
AFF nationally	18.5	15.7	9.6	12.6	21.3	21.5	43.0	41.6
Queensland	36.9	37.3	25.2	24.5	25.8	21.3	51.4	49.9
Employers satisfied with training as a way of meeting their skill needs								
	The VET system							
	Employers with vocational qualifications as a job requirement	Employers with apprentices/trainees	Employers using nationally recognised training	Employers using unaccredited training				
AFF nationally	89.3	79.9*	78.7	96.5	85.1	79.2*	89.8	88.0
Queensland	70.6	65.5	80.5	77.6	80.7	78.2	89.2	89.2

* For 2019 data the estimate has a margin of error greater than or equal to 10% and therefore should be used with caution.

Student outcomes

NCVER survey results of Queensland students who completed a VET qualification in the broad area of study defined as agriculture, environmental and related studies over the past five years are shown in Table 12. Since 2016, a high proportion of students completing a qualification in this area of study reported their main reason for training had been achieved. Conversely a low proportion of students reported being employed in the same occupation as their course. In 2020, the proportion of students employed after completing their qualification in this study area was higher than for completers across all areas of study.

Table 12:
National Student Outcomes Survey, agriculture, environmental and related studies, VET qualification completers, Queensland, all providers, all funding sources, 2016 to 2020 (%)

	2016	2017	2018	2019	2020	2020
Study area	Agriculture, environmental and related studies					All ⁸²
Achieved main reason for doing the training	87.6	85.8	86.1	80.3	82.3	83.6
Developed problem-solving skills	70.4	75.2	77.3	73.3	76.9	83.3
Employed after training	87.3	81.2	83.3	75.7	65.5	56.0
Employed in different occupation to training course and training is relevant	47.6	47.3	42.3	39.7	30.0	25.0
Employed in same occupation as training course	27.8	16.5	21.2	16.4	16.4	25.4

Source: NCVER, VET student outcomes 2020

Queensland Government funded VET

From 1 July 2018 to 4 February 2021, the Queensland Government invested more than \$54 million in primary industry training through the User Choice and Certificate 3 Guarantee (C3G)/higher level skills programs. Primary industry training comprises the agriculture, horticulture and conservation, animal care and management, seafood industry, and forest work products training packages.

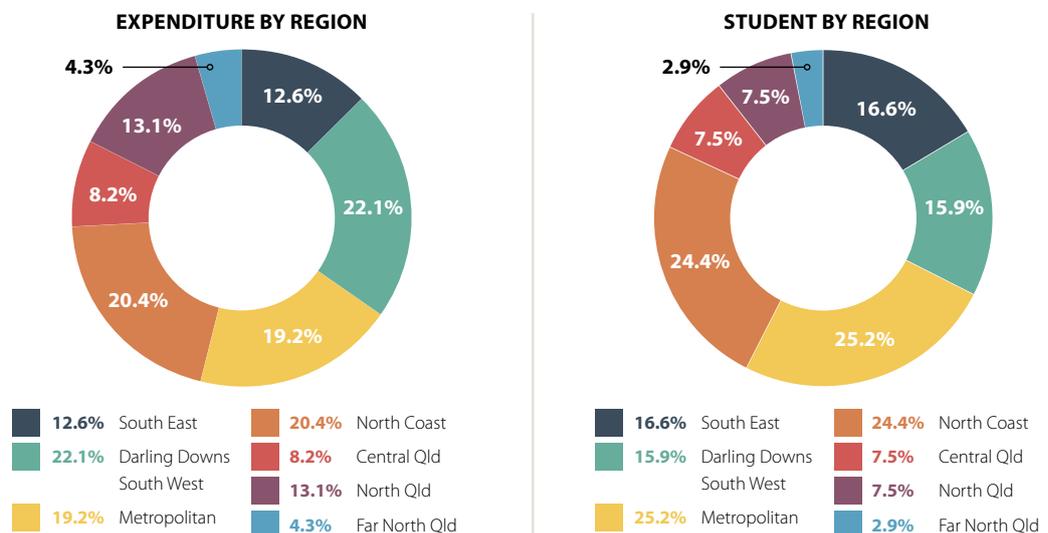
User Choice program

The User Choice program supports the delivery of accredited entry-level training to apprentices and trainees by providing a public funding contribution toward the cost of training and assessment. Between July 2018 and February 2021, more than \$13 million or 25.1 per cent was invested in User Choice with 6904 apprentices and trainees participating in the program.

The Darling Downs South West and Metropolitan regions had the highest level of User Choice expenditure while most students were in the Metropolitan and North Coast regions, as shown in Figure 12. North Queensland had the highest average investment per student (\$3439), followed by Far North Queensland (\$2924) and Darling Downs South West (\$2740).

Figure 12:
User Choice primary industry expenditure and students, by region 1 July 2018 to 4 February 2021

Source: Queensland Department of Employment, Small Business and Training, 2021, DELTA



As of 4 February 2021, the most popular primary industry qualification in 2020-21 was Certificate III in Agriculture, followed by Certificate III in Landscape Construction, Certificate I in Conservation and Land Management, Certificate III in Parks and Gardens and Certificate II in Horticulture. By certificate level the most popular qualifications were:

- Certificate II - horticulture, agriculture, animal studies, conservation and land management, and sports turf management
- Certificate III - horticulture, landscape construction, parks and gardens, sports turf management, and arboriculture
- Certificate IV - farriery, and veterinary nursing (only qualifications for this AQF level).

From 1 July 2018 to 4 February 2021, there were 1429 cancellations – 696 apprenticeships and 723 traineeships. While there were less cancellations overall in 2019-20 compared with 2018-19, the number of cancelled apprenticeships increased. The three regions with the most apprentices and trainees in 2019-20 had the highest number of cancellations – Metropolitan, North Coast and South East, as shown in Table 13.

Table 13: Primary industry user choice cancellations, by region, 1 July 2018 to 4 February 2021

Source: Queensland Department of Employment, Small Business and Training, 2021, DELTA

Region	2018-19			2019-20			2020-21 YTD		
	All	A	T	All	A	T	All	A*	T**
South East	117	57	60	91	58	33	39	24	15
Darling Downs South West	78	5	73	83	12	71	36	4	32
Metropolitan	146	91	55	147	97	50	61	43	18
North Coast	149	84	65	142	95	47	57	28	29
Central Queensland	36	5	31	41	12	29	22	8	14
North Queensland	52	11	41	43	17	26	25	17	8
Far North Queensland	27	14	13	18	8	10	8	6	2
Interstate	1	-	1	-	-	-	-	-	-
Total	606	267	339	565	299	266	248	130	118

* apprenticeships, ** traineeships

Table 14: Primary industry SATs, Queensland, 1 July 2018 to 4 February 2021

Source: Queensland Department of Employment, Small Business and Training, 2021, DELTA

School-based apprenticeships and traineeships

From 1 July 2018 to 4 February 2021, there were 510 students enrolled in primary industry school-based apprenticeships and traineeships (SATs). Most were in agriculture (334), followed by horticulture (153), as shown in Table 14.

	2018-19	2019-20	2020-21 YTD	Total
Agriculture	125	131	78	334
Horticulture	67	61	25	153
Land Management	9	13	1	23
Total	201	205	104	510

Table 15: Primary industry SATs, by region, 1 July 2018 to 4 February 2021

Source: Queensland Department of Employment, Small Business and Training, 2021, DELTA

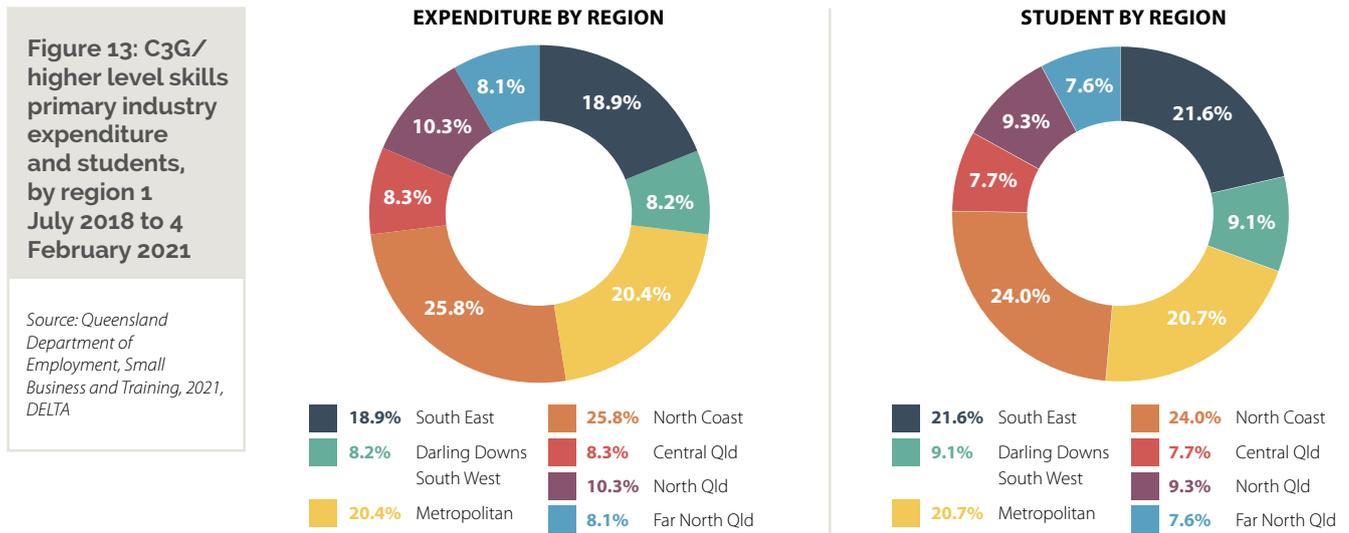
The Darling Downs South West region had the most SATs with 183, followed by the North Coast and South East regions with 86 and 84 respectively. Queensland's two most northern regions had the least number of SATs, as shown in Table 15.

Region	2018-19	2019-20	2020-21 YTD	Total
South East	28	38	18	84
Darling Downs South West	80	66	37	183
Metropolitan	19	17	10	46
North Coast	31	39	16	86
Central Queensland	23	33	13	69
North Queensland	9	7	10	26
Far North Queensland	11	4	-	15
Interstate	-	1	-	1

C3G/higher level skills

The C3G program supports eligible Queenslanders to complete their first post-school Certificate III qualification and increase their skills to move into employment, re-enter the workforce or advance their career. The program supports school students to access training and Year 12 graduates to transition to employment by providing fee-free training in high priority qualifications.

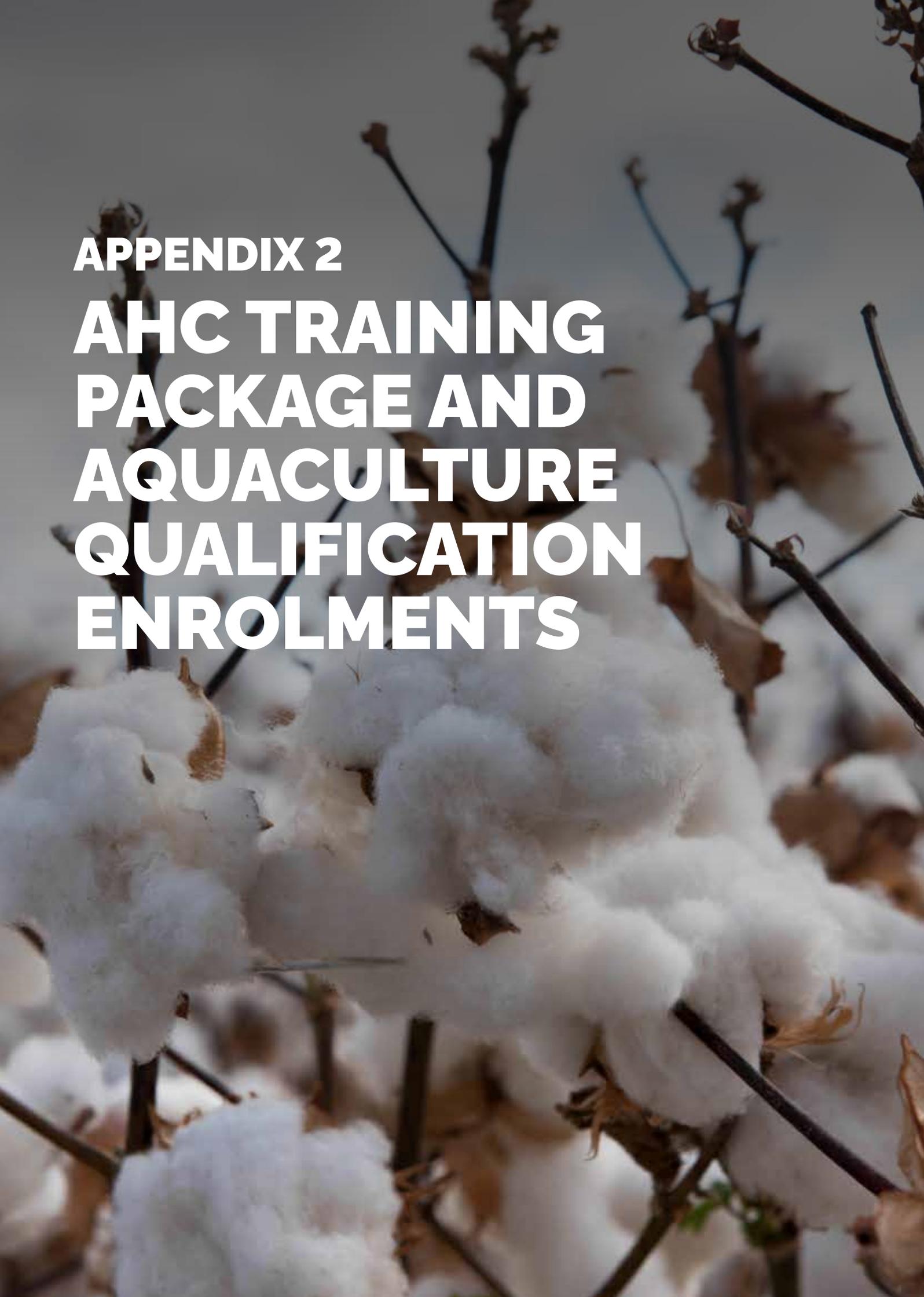
The Queensland Government invested more than \$40 million in C3G and higher skills for primary industry from 1 July 2018 to 4 February 2021 with 19,234 students participating. The North Coast region attracted the most expenditure and students, followed by Metropolitan and South East regions. The average per student investment however was highest for North Queensland (\$3439), followed by Far North Queensland (\$2924) and the Darling Downs South West (\$2740) as shown in Figure 13.



As of 4 February 2021, the most popular C3G qualification for 2020-21 was Certificate III in Landscape Construction, followed by Certificate III in Horticulture, Certificate III in Rural Operations, Certificate II in Rural Operations, and Certificate III in Animal Studies. The most popular qualifications by AQF level were:

- **Certificate II** - rural operations, horticulture, animal studies, conservation and land management, and agriculture
- **Certificate III** - land construction, horticulture, rural operations, animal studies, and parks and gardens
- **Certificate IV** - veterinary nursing, agriculture, agribusiness, and timber processing
- **Diploma level** - agribusiness management, and agriculture.

Skill sets currently funded by the Queensland Government are agricultural chemical, farm business management, irrigation contractor, irrigation installer, pressurised irrigation system operator, and technical skills for sport turf management, although industry feedback suggests the funding of more skill sets is needed.



APPENDIX 2

**AHC TRAINING
PACKAGE AND
AQUACULTURE
QUALIFICATION
ENROLMENTS**

Table 16: Total program and VETiS enrolments by AHC training package and aquaculture qualification, Queensland, 2016 to 2019

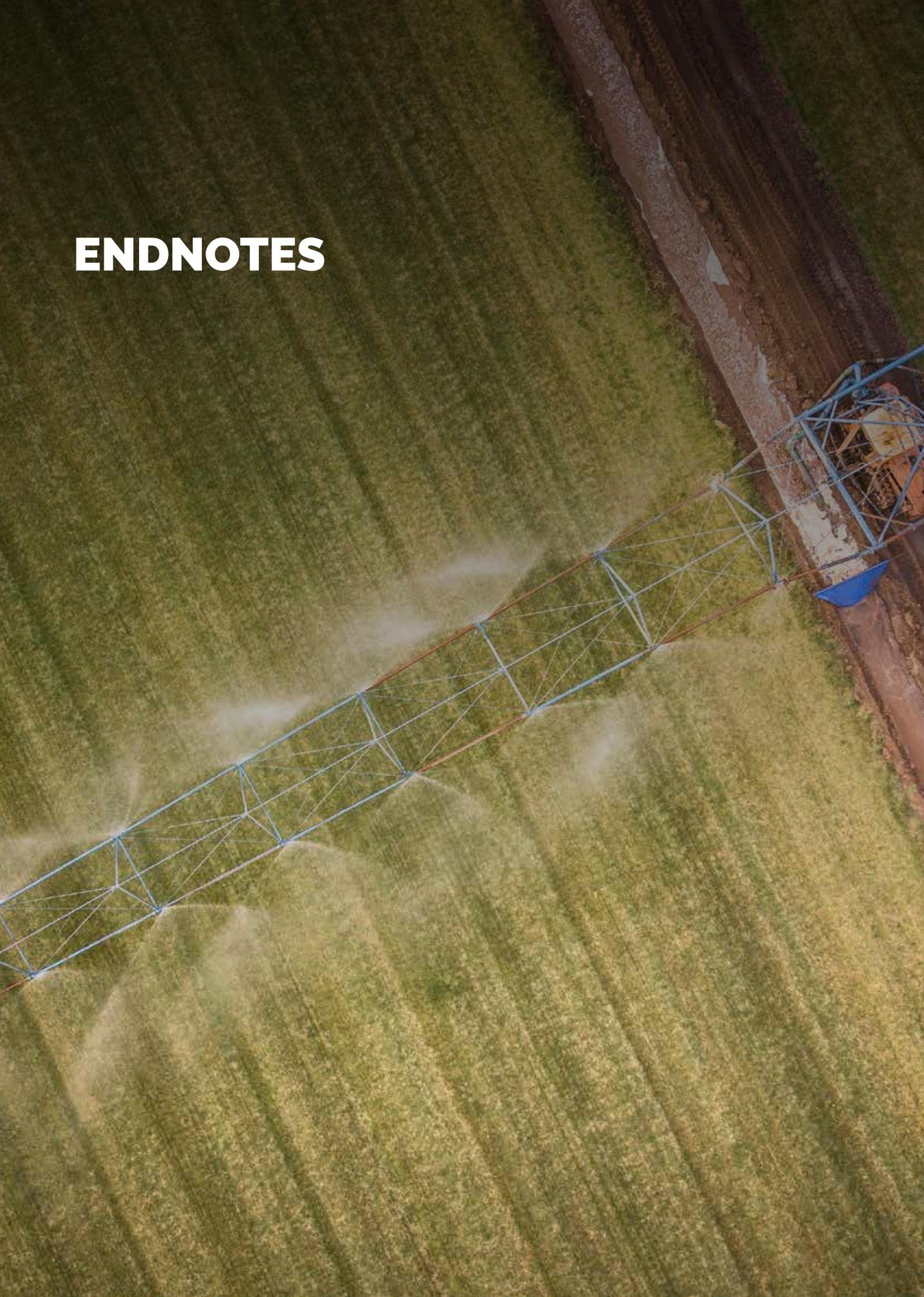
Source: NCVET, 2021, Australian VET statistics, DataBuilder
28 April

AHC and aquaculture qualification	Program enrolments				VETiS enrolments			
	2016	2017	2018	2019	2016	2017	2018	2019
Total enrolments	19,235	17,735	12,825	13,780	3410	4370	2925	3065
Certificate I in Conservation and Land Management AHC10110, AHC10116	1400	1140	990	960	100	125	75	85
Certificate I in AgriFood Operations AHC10210, AHC10216	515	405	285	395	420	405	295	395
Certificate I in Horticulture AHC10316		10	30	50		10	30	50
Certificate II in Agriculture AHC20110, AHC20116	480	410	325	405	310	270	240	250
Certificate II in Production Horticulture AHC20310, AHC20316	20	15	20	20	20	15	20	20
Certificate II in Horticulture AHC20410, AHC20416	1530	1690	1345	1440	605	565	425	525
Certificate II in Arboriculture AHC20513	25	5						
Certificate II in Parks and Gardens AHC20616			5					
Certificate II in Sports Turf Management AHC20910, AHC20916	5	5	10	5	5	5	5	5
Certificate II in Conservation and Land Management AHC21010, AHC21016	660	745	435	420	85	110	85	120
Certificate II in Rural Operations AHC21210, AHC21216	2670	3120	2020	1590	1370	2125	1310	1160
Certificate II in Shearing AHC21316			5					
Certificate II in Landscaping AHC21610, AHC21610	60	95	115	90	40	70	35	20
Certificate III in Agriculture, AHC30110, AHC30116	1120	905	655	565	255	470	280	285
Certificate III in Agriculture (Dairy Production) AHC30210	5							
Certificate III in Horse Breeding AHC30310	5							
Certificate III in Pork Production AHC30410, AHC30416	65	60	65	75				
Certificate III in Poultry Production AHC30516		10	40	35				
Certificate III in Production Horticulture AHC30610, AHC30616	20	50	230	340		10	10	5
Certificate III in Horticulture AHC30710, AHC30716	1635	1475	1350	1835	5	15	5	5
Certificate III in Arboriculture AHC30810, AHC30816	700	630	155	290	5			

AHC and aquaculture qualification	Program enrolments				VETiS enrolments			
	2016	2017	2018	2019	2016	2017	2018	2019
Certificate III in Landscape Construction AHC30910, AHC30916	1450	1610	1440	1645	40	30	35	60
Certificate III in Parks and Gardens AHC31010, AHC31016	910	820	535	660	5	10	5	10
Certificate III in Production Nursery AHC31110, AHC31116	30	30	25	65				5
Certificate III in Retail Nursery AHC31210, AHC31216	10	10	5	5				
Certificate III in Sports Turf Management AHC31310, AHC31316	135	180	145	135	10	15	10	5
Certificate III in Conservation and Land Management AHC31410, AHC31416	440	405	280	405	5	10	5	5
Certificate III in Indigenous Land Management AHC31510	15	10						
Certificate III in Natural Area Restoration AHC31716		5						
Certificate III in Vertebrate Pest Management AHC31810	5							
Certificate III in Beekeeping AHC31818, AHC32010, AHC32016	10	15	15	30				
Certificate III in Irrigation AHC32412, AHC32416	15	20	25	25				
Certificate III in Rural Operations AHC32810, AHC32816	3875	2700	1685	1735	130	105	45	60
Certificate III in Feedlot Operations AHC33311, AHC33316		60	75	55				
Certificate III in Permaculture AHC33816		5						
Certificate IV in Agriculture AHC40110, AHC40116	65	65	90	85				
Certificate IV in Production Horticulture AHC40310	55							
Certificate IV in Horticulture AHC40410, AHC40416	20	50	35	50				
Certificate IV in Parks and Gardens AHC40510	5							
Certificate IV in Sports Turf Management AHC40812	5	5						
Conservation and Land Management AHC40910, AHC40916	165	80	20	15				
Certificate IV in Agribusiness AHC41010	10							
Certificate IV in Wool Classing AHC41313, AHC41316	5			5				
Certificate IV in Pest Management AHC41716				15				
Diploma of Agriculture AHC50110, AHC50116	155	185	90	80	5	5	5	
Diploma of Pork Production AHC50213, AHC50216	5	10	5	5				
Diploma of Production Horticulture AHC50310	5	5						

AHC and aquaculture qualification	Program enrolments				VETiS enrolments			
	2016	2017	2018	2019	2016	2017	2018	2019
Diploma of Horticulture AHC50410, AHC50416	570	305	45	30				
Diploma of Arboriculture AHC50510, AHC50516	25	35	35	60				
Diploma of Landscape Design AHC50610, AHC50616	70	80	45	25				
Diploma of Sports Turf Management AHC51010, AHC51016	10	10	10	5				
Diploma of Conservation and Land Management AHC51110, AHC51116	160	180	65	45				
Diploma of Agribusiness Management AHC51410, AHC51416	75	60	45	65				
Diploma of Organic Farming AHC51812, AHC51816	5	10	5	5				
Diploma of Permaculture AHC52116		5	5					
Advanced Diploma of Agribusiness Management AHC60310, AHC60316	5	5	5	5				
Advanced Diploma of Conservation and Land Management AHC60410		5						
Certificate II in Aquaculture SF120111, SF120119	50	50	30	40	50	50	25	35
Certificate III in Aquaculture SF130111	5	20	40				20	
Diploma of Fisheries Compliance SF150411	10	5	5	5				

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82. All broad areas of study include natural and physical sciences, information technology, engineering and related technologies, architecture and building, agriculture, environmental and related studies, health education, management and commerce, society and culture, creative arts, food, hospitality and personal services, and mixed field programmes.



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Level 3, 183 North Quay, Brisbane QLD 4000
PO Box 12009 Brisbane QLD 4003
07 3837 4720

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