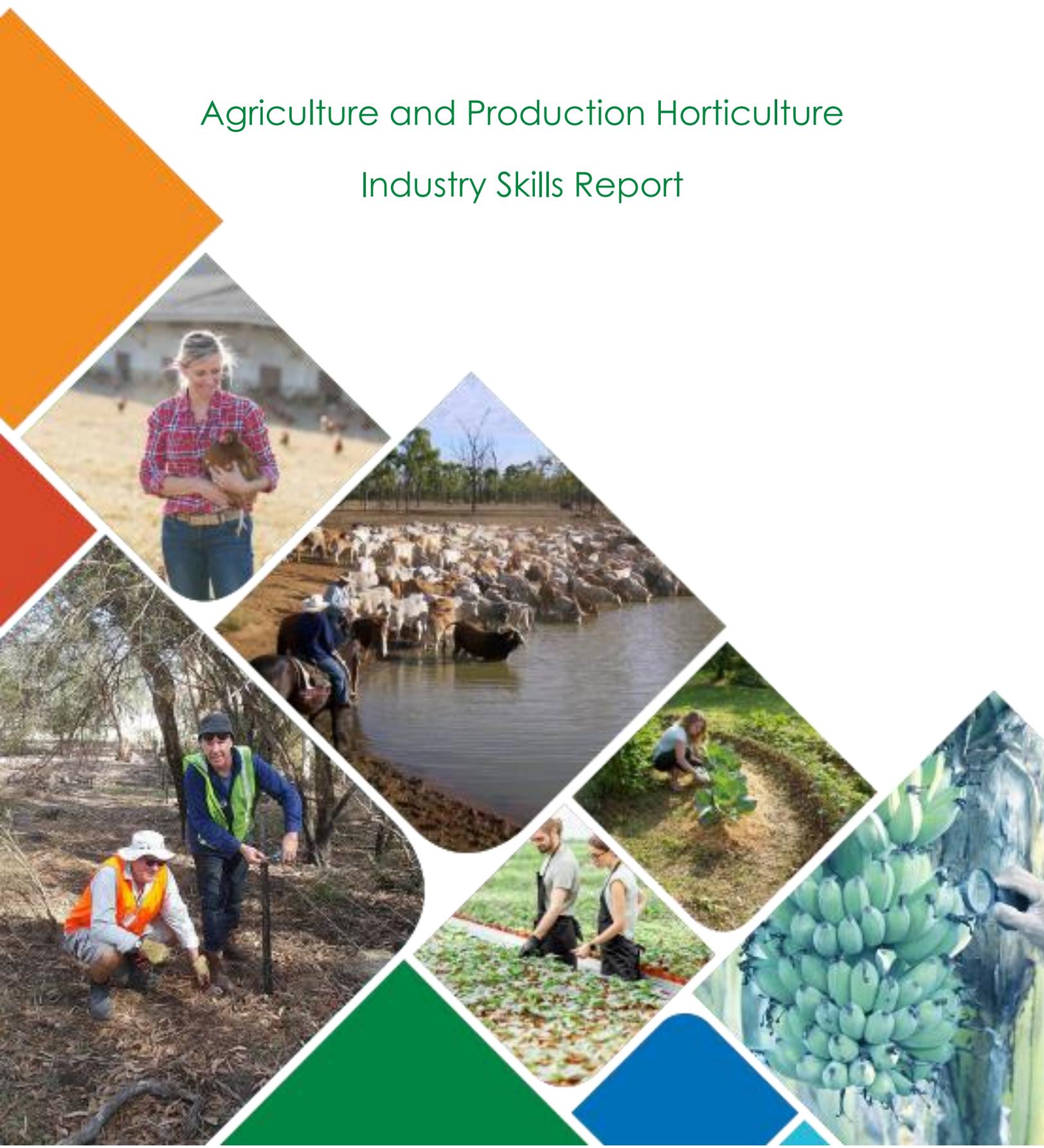


Agriculture and Production Horticulture

Industry Skills Report



Contents

- Acknowledgement of the work of IRCs3**
- Acknowledgement of Country3**
- Purpose4**
- Key Findings and Priorities5**
- Industry Reference Committee6**
 - Agriculture and Production Horticulture IRC6
- Method6**
- Environmental Analysis7**
 - Whole of Value Chain Approach.....7**
 - Traceability, provenance and blockchain7
 - Capital investment and training provision.....9
 - Current crossovers and divisions of the value chain in the VET system10
 - Biosecurity, Invasive Species and Pest Control.....11**
 - National Plant Biosecurity Strategy11
 - Animal Biosecurity12
 - Sustaining plants and animals13**
 - Plants13
 - Animals13
 - Ecosystem Management, Continuing Climate Adaptation and Carbon Capture and Storage14**
 - Aboriginal and Torres Strait Islander Custodianship16
 - Climate and carbon.....16
 - Water and soil.....17
 - Digital & Automation Practices.....19**
 - Transforming Practices.....19
 - Environmental regulations, codes of practice and guidelines21**
 - Workplace and Value Chain Risk Management and Safety Culture21**
 - Workplace safety21
 - Natural disaster planning, response and recovery22
- Industry Summary and Trends24**
 - Workforce, Business and Market Summary24**
 - Shortage of skilled workers and skills priorities25
 - Workforce management and planning strategies27
 - Training Summary32**
 - VET participation32
 - Rural, Regional & Remote Summary34**
 - Aboriginal & Torres Strait Islander Peoples Summary34**

Acknowledgement of the work of IRCs

We acknowledge the work of the members of Industry Reference Committee (IRC) in the preparation of this report and continuing phases of the project. Their voluntary participation and provision of intelligence and data makes the compilation of this information possible.

This report has been developed from six years of contributions from the Industry Reference Committee.

Acknowledgement of Country

Aboriginal and Torres Strait Islander peoples have a proud and continuous connection to Australia's land and waters. We acknowledge the traditional owners and custodians, and the continuing connection of Aboriginal and Torres Strait Islander peoples to the lands, waters and communities. We pay our respects to Elders and Leaders, past and present, and to all Aboriginal and Torres Strait Islander peoples who have supported our work.

We acknowledge the importance of learning from Aboriginal and Torres Strait Islander peoples' unique history of land and ecosystem management, art, culture and society. Their connections are particularly important given our involvement in work directly connected to utilisation, care and stewardship of Australia's land, waters and ecosystems, and the animals, trees and plants that thrive across Australia.

The Industry Reference Committees and Skills Impact have been working to develop improved participation of Aboriginal and Torres Strait Islander enterprises, businesses, communities and people in our work. We will continue to work to develop strong, mutually beneficial relationships with Aboriginal and Torres Strait Islander partners who can help us deliver better outcomes for Aboriginal and Torres Strait Islander peoples, recognising their expertise in improving quality of life, employment opportunities and skills outcomes in their communities and for the whole of Australia.

Purpose

Skills Impact has prepared this Industry Skills Report at the request of the Agriculture and Production Horticulture Industry Reference Committee (IRC). It provides in-depth information about industry-specific skills and issues covered in the *Agribusiness, Food and Fibre Industries Skills Report*.

As one of nine industry-specific Skills Reports with matching structures, this document is designed to assist collaboration across industries and the streamlining and reform of the Australian skills and VET system. This may aid the implementation of the Skills Minister's Priorities by supporting:

- Greater labour mobility through stronger recognition of cross-sector and transferable skills
- Better use of industry and educator expertise to ensure better quality outcomes
- Improved pathways advice to support lifelong learning and build peoples' labour market resilience
- Australia's capacity to grow, compete and thrive in the global economy, especially in context of the concurrent impacts of COVID-19, automation and digital transformation on the skills required for jobs now and into the future.

The IRC requested that this report be prepared to support improvements in the skills system, including work on:

- Industry workforce planning and strategies to address workforce shortages
- Documenting shared standards and regulations across industries to support end-to-end systems planning and avoid duplication
- The provision of evidence, data and intelligence to add value for industries beyond a narrow focus on training package development, and to inform future Industry Clusters or similar bodies approved to undertake work within the Australian skills and VET system
- Creating foundations for potential qualification reforms with a greater emphasis on skills families and portable skills
- Identifying shared 'skills domains' to aid in simplifying and streamlining national VET qualifications across industry groupings.

Key Findings and Priorities

The Agriculture and Production Horticulture industries are going through significant transformation and facing challenges from multiple sources, including natural disasters, global markets, changing consumer taste, technological development and the COVID-19 pandemic.

With such a smorgasbord of issues impacting on agriculture, it is difficult to identify the priorities relating to workforce planning and skills needs. Currently it is clear that the industry needs access to labour, recovery from natural disasters, stabilisation of markets, and access to new and recently closed markets before workforce planning and skills needs can be addressed.

The Agriculture and Production Horticulture Industry Reference Committee has identified priorities which they recommend for future consideration, including:

- The finalisation of the Unit Sector Approach for reviewing the *AHC Training Package*, and further consideration of the Rural Operations qualifications, including the potential for broader skills requirements as a key part of rural activities.
- Working with other industry clusters, identify qualifications that need to incorporate new and updated units from the current *AHC Training Package* project to establish:
 - a quick way to ensure adequate consultation can take place to update qualifications to ensure access to the most recent training standards and to assist delivery of units by RTOs
 - any assistance that can be provided across all industries utilising AHC training products to enhance appropriate implementation, enrolments and viability of training delivery
- evaluation of the Unit Sector Approach for the review of the *AHC Training Package*
- working with other agribusiness, food and fibre industries on research and planning projects to identify and address skills gaps relating to traceability, provenance and blockchain
- identifying digital skills needs using the Agricultural Digital Workforce Framework, and the Digital Workforce Capability and VET framework currently in development (along with other digital capability frameworks).

An additional requirement is to change the codes of qualifications and skill sets that are impacted by unit code changes resulting from projects in 2022 (to be released in the forthcoming AHC V9). A broad review of units in 2022, including through the Unit Sector Approach, has led to unit code changes, and in some cases content changes are Not Equivalent. There are still 45 AHC qualifications and 20 skill sets that would be subject to major changes. It is proposed the work required to make these updates is done as part of a small project in 2023 so that:

- Stakeholders can comment on the changes, including whether updated units that are Not Equivalent are still suitable or should be replaced within the qualification by other existing units
- Stakeholders are provided with adequate time to prepare for the changes
- Other SSOs projects planned endorsed at the end of 2022 will be able to update a greater number of imported units at the same time, avoiding separate updates and reducing qualification churn.

Signed on behalf of the Agriculture and Production Horticulture Industry Reference Committee:



Chair: Geoff Harvey

Date: 28/09/2022

Industry Reference Committee

The Agriculture and Production Horticulture (APH) Industry Reference Committee (IRC) is responsible for national training package qualifications relevant to agriculture and horticulture. Qualifications overseen by the IRC are in the *AHC Agriculture, Horticulture and Conservation and Land Management Training Package*. The APH IRC is supported by the Skills Service Organisation, Skills Impact.

Agriculture and Production Horticulture IRC

Name	Organisation or Area of Expertise
Dianne Fullelove	Expertise in production horticulture and agricultural chemicals
Geoff Harvey (Chair)	Expertise in agricultural irrigation
Greg Owens	NT Farmers Association
Gordon Verrall	Expertise in agricultural business practice
Jacqueline Heap	Expertise in livestock and production horticulture
Jane Wightman	Horticulture Innovation Australia
John Kargotich	Western Australian Farmers' Federation
Judi Forsyth	Expertise in livestock and broadacre farming
Meg Parkinson	Expertise in livestock-poultry production
Reginald Kidd	National Farmers' Federation
Rick Whistler (Deputy Chair)	Expertise in livestock and agricultural support services
Rob Fenton	Expertise in organic farming
Ron Paynter	Expertise in livestock – dairy production
Shane Roulstone	Australian Workers Union

Method

Industry Reference Committees oversee the work of Skills Service organisations in the collection and analysis of industry intelligence, which is used to:

- Identify industry skills needs and challenges
- Identify issues and potential improvements to the Skills and VET system
- Provide the basis for work to update VET training package products
- Provide an information source for industry to assist with business, workforce, skills and training planning.

The information in this report has been collated from a variety of sources identified by Industry Reference Committee members and industry stakeholders who have participated in consultations with Skills impact. It also utilises data and information from official sources and major commercial providers through the assistance of the Australian Government Department of Education, Skills and Employment.

Environmental Analysis

Whole of Value Chain Approach

The Agriculture and Production Horticulture (AHC) value chain is key to the Australian economy and indirectly supports many value chains in Australia, especially those related to regional, rural and remote Australia. It encompasses all stakeholders who are linked in collaborative relationships to provide consumers with agricultural and horticultural products and services. Value-adding occurs when skilled workers representing different industries or businesses conduct work on specific products or resources that results in them changing form or taking on an additional attribute (see the *Agribusiness, Food and Fibre Industries Skills Report* for more details). This occurs prior to farming applications, through custodianship of the land and the sea; within the farm, by adopting multiple or specialist production methods, including organic or permaculture farming methods; and further down the supply chain in food processing, and packaging.

The value added to a product or service is often determined by consumer demand, and local and international markets, which are shaped by variables such as government policy and concerns for sustainability. The *National Agriculture Workforce Strategy (NAWS)*¹ notes that a whole of value chain approach is essential not only for understanding the ways in which industries work together but also to implement robust and adaptable systems, especially to meet changing consumer demands.

All stages of the Agriculture and Production Horticulture value chain are supported by cross-sectoral skills and knowledge in biosecurity, infection control, traceability, sustainability and safety (each addressed in greater detail below). These technical skills are further enabled by employability skills in communication, strategic planning, data analysis, management and leadership, digital literacy, and science, technology, engineering, mathematics (STEM). Employers' ability to access workers with such skills creates unique challenges and opportunities across the value chain.

Various strategies and initiatives are developing collaborative approaches across value chain industries; for example, the Ag Innovation Expo in Tasmania acts as a key networking event, bringing together primary producers, agricultural product processors, agribusinesses, vendors of farm machinery and technology, and government, to share knowledge and ideas about how to advance integrated value systems approaches for mutual benefit. The 2022 Expo highlighted that holistic strategies are required to develop value chain resilience, including for issues of mutual concern such as technological transformation, soil health, animal health, environmental sustainability, new products, new practices, biosecurity, safety protocols, and regulatory compliance – all of which requires collaboration and a skilled workforce to enable progress towards the National Farmers' Federation's \$100 billion target².

Traceability, provenance and blockchain

Traceability is the ability to follow the movement of animal, plant, food, feed, chemical or other products through relevant stages of production, processing and distribution (see the *Agribusiness, Food and Fibre Industries Skills Report* for more details). Over the last five years, multiple Industry Skills Forecasts and Annual Updates prepared by the Agriculture and Production Horticulture Industry Reference Committee have emphasised the importance of traceability and provenance knowledge and skills for national and international consumer markets, compliance, safety and welfare, licensing and prevention of fraud.

¹ J. Azarias, R. Nettle & J. Williams (2020); *National Agricultural Workforce Strategy: Learning to excel*; National Agricultural Labour Advisory Committee; Canberra, December; p.xiv

² Premier of Tasmania (2022); *Future of agriculture on display at 2022 Ag Innovation Expo*; https://www.premier.tas.gov.au/site_resources_2015/additional_releases/future_of_agriculture_on_display_at_2022_ag_innovation_expo; viewed 30/05/2022.

The National Farmers Federation has welcomed the Federal Government's recent \$68.4 million investment in the expansion and streamlining of agricultural product traceability to improve consumer and trading partner confidence in Australia's sustainable and bio-secure production³. Key elements of the investment include:

- A National Agricultural Traceability Alliance between industry and all levels of government to develop national leadership and more collaborative approaches to traceability
- A National Agricultural Traceability Hub to progress data standardisation to ease administrative and compliance barriers
- Agricultural Credentials Initiatives to develop an online tool to provide information on existing and emerging credentials; a roadmap to harmonise the fragmented credentialing approaches that underpin Australian farm products; and grants to support industry capabilities development.

Various systems, research projects and educational offerings are being implemented to further expand traceability systems in agriculture and production horticulture; for example, the Australian wool industry has begun trials on e-bales, which track wool through the supply chain electronically using QR codes. A commercial trial is underway at Alma, a sheep station with 8,000 merino ewes, where the technology is expected to improve efficiency, biosecurity and, at the end of the value chain, consumer access to wool provenance information (transparency on the geographic origin and source of products to meet legal and cultural demands)⁴. Skilled workers are required to implement such innovative traceability systems, and this is supported by specialist wool classing qualifications (such as the *Certificate IV in Wool Classing* within the VET system) that also enable wool classers to apply for registration with AWEX Ltd. as a professional Australian wool classer.

In the livestock and dairy sectors, Australia's National Livestock Identification System (NLIS) is a traceability system for the consistent identification of cattle, pigs, sheep and goats, and associated biosecurity and food safety monitoring. The NLIS is endorsed by major producer, feedlot, agent, saleyard, and processor bodies, and is underpinned by state and territory legislation, which forms the regulatory framework for the system. The NLIS includes three principles to enable the traceability of animals across the value chain:

1. All livestock are identified by a visual or electronic eartag or device at the property of their birth.
2. As animals are bought, sold and moved along the supply chain, each movement is recorded centrally on the NLIS central database.
3. A life history of an animal's movements can be mapped because all physical locations that they occupy are recorded with a Property Identification Code (PIC).⁵

Such traceability systems help protect the reputation of Australia's livestock industry as a supplier of 'clean' meat and dairy products for domestic and export markets⁶.

The horticulture industry is now trialling and implementing traceability systems to tell the story of where products come from. For example, Agriculture Victoria has recently partnered with Citrus Australia to trial traceability along the citrus value chain to track fruit 'from tree to table'. The intention is to give consumers assurances about how and where their food is produced, and to provide growers with more information about where their food is going, which can inform decisions on future investments, market access and value

³ National Farmers Federation (2022); *Improved traceability aims to unlock better returns for farmers*; <https://nff.org.au/media-release/improved-traceability-aims-to-unlock-better-returns-for-farmers/>; viewed 24/01/2022.

⁴ ABC News (2021); *Commercial trial of e-bales for wool traceability underway at Riverina's Alma Station*; <https://www.abc.net.au/news/2021-11-01/qr-codes-to-track-wool-provenance-in-wool-industry-ebale-trial/100584594>; viewed 24/01/2022.

⁵ National Livestock Identification System (2022); *Welcome to NLIS*; <https://www.nlis.com.au/>; viewed 24/01/2022.

⁶ Agriculture Victoria (2022); *National Livestock Identification System (NLIS)*; <https://agriculture.vic.gov.au/livestock-and-animals/national-livestock-identification-system>; viewed 24/01/2022.

chain partnerships⁷.

Traceability systems are enabled through various technologies, such as distributed ledger technology (e.g. blockchain) and apps used by on-farm workers to scan individual items. Blockchain-based traceability systems are being trialled in the fruit industry to harmonise data sets within a single online platform, which allows for effective product control, safety, recall, supply chain management, and consumer information and quality⁸. In the pork industry, state and territory governments have been introducing mandatory reporting of all pig movements to the PigPass database since 2018. All states have either passed this into legislation or have made progress towards this. To support these endeavours, the PigPass mobile app was created and rolled out in 2019. This application is to strengthen the quality and accuracy of pig traceability data collected by the PigPass system and increase the efficiency of emergency animal disease responses⁹.

Developing and streamlining the technology and workforce skills to enable advanced traceability systems is key to unlocking additional value from agricultural products. It will help maximise the credentials – and hence value – of in-demand products, save businesses money and time through harmonised traceability systems, and reduce the potential economic impact of biosecurity outbreaks¹⁰.

Capital investment and training provision

Capital investment in Agriculture and Production Horticulture is essential for lifting productivity across the value chain. Access to efficient capital is a key driver for strong, sustained sectoral growth over the short-, medium- and longer-terms; however, the level of capital investment in agribusiness has not kept pace with the consumption of capital over the last decade. AgriFutures Australia describes bridging this investment gap as a 'daunting challenge'¹¹, requiring action from governments, industry, and businesses to attract new capital.

This is reflective of concerns for the sustainability of the industry due to escalating input costs, workforce issues and input supply chain insecurity. QFF chief executive officer Jo Sheppard has reported on members' concerns:

'Fuel, fertiliser, chemicals, and many other inputs are sourced from overseas. Over the last 2 years we have seen the costs of these increase by, in some cases, 150%. Most consumers have not yet seen the impact of this as farmers have absorbed many of these price increases, however this is not sustainable.'

<https://www.qff.org.au/media-releases/qff-says-farmers-need-input-costs-surety-security/>

Input volatility destabilises operating environments and compromises the ability of businesses to raise sufficient capital to support consolidation, productivity, and investments to raise efficiency.

Alongside technology and infrastructure capital investments, investing in workers' capabilities development is extremely important to business strategies. While there is an understandable focus on investing in technology, better data provision, and market diversification to pursue immediate financial returns, there is a rising shortage of people to fill technical and leadership roles and to make business decisions on the most effective use of that technology across the value chain. As the NAWS states:

'Only well-educated and skilled people who understand the importance of business and HR

⁷ Agriculture Victoria (2021); *Citrus Traceability Pilot*

⁸ Agriculture Victoria (2022); *Growing food and fibre markets*; <https://agriculture.vic.gov.au/export/pathways-to-export/growing-food-and-fibre-markets>; viewed 05/07/2022.

⁹ Australian Pork Ltd (2022); *Welcome To PigPass*; <https://pigpass.australianpork.com.au/faq>; viewed 05/07/2022.

¹⁰ Australian Government (2022); *Stepping up agricultural traceability*; https://www.awe.gov.au/sites/default/files/documents/traceability_fact_sheet.docx; viewed 05/07/2022.

¹¹ Natural Capital Economics (2020); *Capital requirements of Australia's agriculture, fisheries, and forestry sector*; AgriFutures, Project number: 0920016.

management, of land and sea custodianship and of the potential of technology are able to take advantage of technological solutions. In other words, it is people who come first and the right technology will follow naturally.'

J. Azarias, R. Nettle & J. Williams (2020); National Agricultural Workforce Strategy: Learning to excel; National Agricultural Labour Advisory Committee; Canberra, December; p.iii

Current crossovers and divisions of the value chain in the VET system

Agriculture and production horticulture has critical value chain connections to other industries, as outlined in detail in the Agribusiness, Food and Fibre Industries Skills Reports.

Key links and crossovers requiring collaboration include:

- The Amenity Horticulture, Landscaping, Conservation & Land Management industry (covered by the AHC *Training Package*)
- Processing and Retailing
 - Fruit, vegetable and grape growers collaborate with other food processing businesses to add value to products, and share skills requirements associated with food safety and handling practices. Some large agricultural businesses and producers particularly in the organic production and viticulture sectors have vertically integrated and undertake functions across farming or production, processing, packing and sales. Others are adding retail operations to improve viability.
- Water-based trading, habitat protection and restoration
 - Water trading has relationships with other industry sectors, as Australia works to ensure adequate water supplies for multiple needs. There is cross-over in the skills and the locations of work relating to water-based environmental protection and restoration in the river systems and sea reserves, as well as habitat and species management
- Tourism and Hospitality
 - Tourism and hospitality (covered by the *Tourism, Travel and Hospitality Training Package*) is connected with the regional and remote industry operators. Some businesses and operators are now creating partnerships to supply goods and services through tourism and hospitality functions, including emersion tourism. Biosecurity management is become a higher priority for the agritourism sector.
- Professional Support Services
 - Supportive occupations such as veterinary services, environment, water and waste management expertise, financial and carbon traders
- Transport & Logistics
 - The disruptions of the COVID-19 pandemic, especially during 2020 and 2021, highlighted the risk to the agricultural industry in both import and export supply chain failures. Agriculture has seen significant issues in the supply of fossil-based fuel, fertiliser and chemical products which has led to increase overall in the cost of production
- Research
 - All agricultural industries work closely with research bodies on improving production including plant and animal genetics, control of pest, weeds and biosecurity, environmental impacts including soils and climate

Biosecurity, Invasive Species and Pest Control

Please see the *Agribusiness, Food and Fibre Industries Skills Report* for information on the significance of biosecurity incursions and corresponding skills and knowledge.

The Australian Government Department of Agriculture, Water and the Environment's consultation draft for the forthcoming *National Biosecurity Strategy* acknowledges that, while Australia's biosecurity system has served us well, there are growing and more complex biosecurity risks emerging from phenomena such as climate change and land use changes, which have an impact on the prevalence and incidence of animal disease outbreaks and pest incursions. The number of risks *and* sources of risk are increasing simultaneously, requiring that Australia develops and sustains 'a highly skilled workforce to ensure we have the right capability, in the right place, at the right time'¹².

Biosecurity in Agriculture and Production Horticulture involves the skills and knowledge required for the protection and preservation of crops, plant and animal species, and to control weeds and pests across multiple, complex ecosystems on land and in water. Duties are undertaken within a range of occupations, including weed management field officers, pest management field officers, pest management contractors and vertebrate pest management field officers. Senior pest management officers and managers fulfil roles for planning and managing small- to large-scale pest management programs, which may include participating in emergency operations, such as disease outbreaks. This often involves coordinating programs and practices around strategic invasive species management, weed management programs that require chemical spraying, maintaining required records, and assessing the efficacy of different programs.

Sessions of the *2022 Australian Biosecurity Symposium* highlighted that human behaviour creates the greatest risks of transporting pests and disease, and that education and public awareness is key to lessening potential dangers associated with pest animals, weeds, wildlife, aquatics, humans and the environment¹³.

National Plant Biosecurity Strategy

Exotic plant pests can damage the natural environment and severely impact on Australian agriculture and production horticulture. The National Priority Plant Pests have been reviewed by the Department of Agriculture, Water and the Environment's Plant Health Committee. For example, the khapra beetle, while not present in Australia, is identified as the number two National Priority Plant Pest and the number one pest for grains. A widespread incursion could cost the economy \$15.5 billion over 20 years because, if the beetle were to establish, many trading partners would reject stored produce from Australia, which is significant as much of the grain grown domestically is exported. As such, government action and investment are focussing on national preparedness capabilities¹⁴.

The *2021-2031 National Plant Biosecurity Strategy*¹⁵ was released in April 2022 by Plant Health Australia to provide a framework for strengthening Australia's plant biosecurity system over the next ten years. The strategy outlines key areas for building a 'resilient and contemporary national plant biosecurity system that will continue to support Australian plant industries, economy, environment, and communities. These focus on supporting diagnostic capabilities, preparing for potential plant biosecurity incidents through training and professional development activities, developing and utilising digital resources and tools to prevent, identify and respond to plant biosecurity incidents, and to use technology in the appropriate collection, synthesis, and analysis of plant biosecurity data. The document summarises a strategic priority for 'sustained support', the ability to manage plant biosecurity risks and retain Australia's favourable biosecurity status, which 'relies

¹² Department of Agriculture, Water and the Environment (2022); *National Biosecurity Strategy – Consultation draft*; Canberra, February. CC BY 4.0; p.10.

¹³ The biosecurity collective (2022); About the Symposium; <https://www.biosym.com.au/about/>; viewed 31/08/2022.

¹⁴ Australian Government (2022); *Plant pests and diseases*; <https://www.awe.gov.au/biosecurity-trade/pests-diseases-weeds/plant>; viewed 31/08/2022.

¹⁵ Plant Health Australia (2022); *National Plant Biosecurity Strategy*

on skilled and responsive participants across the entire system'. The skills and knowledge within the national biosecurity system must therefore be 'enhanced, retained and shared'.

To reinforce these messages, Plant Health Australia hosted its second Joint Industry Government Surveillance workshop in April 2022 to promote the value of collaboration and skills concerning surveillance, data collection and data use. The series was designed with respect to the objectives of *Northern Australia Biosecurity Strategy* and the *Tropical Plant Industries Biosecurity Surveillance Strategy*, which both note that collaboration and partnerships are crucial because no single agency can meet all biosecurity needs across northern Australia. The focus of the workshop was also to describe the different data being collected by government and industry, and identify the skills needed to ensure complementary crop production and biosecurity surveillance outcomes¹⁶.

Animal Biosecurity

To maintain animal disease freedom, Animal Health Australia highlight necessary knowledge and skills for preparedness and response, including to improve national African swine fever (ASF) arrangements¹⁷. Such objectives have also been identified by projects initiated as part of the *Agricultural Competitiveness White Paper*, with project outcomes including:

- strengthened animal health surveillance capacity and enhanced capability to show freedom from pests and diseases (facilitated through targeted training)
- improved community-based biosecurity activities
- improved scientific capability
- improved ability to collect, store, analyse and share biosecurity information for interpretation and analysis¹⁸.

To support these national strategies, there have been a number of industry-led biosecurity initiatives:

- In its 2021 Annual Update, the Australian Beef Sustainability Framework (ABSF) reported that 91% of Australian Livestock Production Assurance (LPA) accredited cattle properties had a documented biosecurity plan in 2020, up from only 25% two-years previously¹⁹.
- Implementation of a *National Sheep Industry Biosecurity Strategy*²⁰, including to access the resources and skills necessary to effectively manage new and existing biosecurity threats.
- The chicken meat industry updated its *National Farm Biosecurity Manual for Chicken Growers* in 2020. Compliance with the manual is required for chicken growers under contractual arrangements with the chicken-processing companies they supply.

Recent biosecurity concerns in Australia, including Japanese encephalitis and foot-and-mouth disease, have highlighted the need for cohesive strategies to ensure the welfare of humans, animals, and industries generally. These events have significant implications for worker safety, biosecurity surveillance systems and response mechanisms, pest animal management, and skills training²¹. Government advice is that

¹⁶ Plant Health Australia (2022); *Joint Industry-Government Surveillance workshop series*;

<https://www.planthealthaustralia.com.au/joint-industry-government-surveillance-workshop-series/>; viewed 31/08/2022.

¹⁷ Animal Health Australia (2021); *Animal Health in Australia Annual Report 2019–2020*; Canberra, Australia; p.1.

¹⁸ Australian Government (2021); *Outcomes of animal health-related projects funded under the Australian Government's Agricultural Competitiveness White Paper*; <https://www.awe.gov.au/agriculture-land/animal/health/animal-health-related-projects/>; viewed 31/08/2022.

¹⁹ MLA (2022); *Case study: The role of biosecurity in industry sustainability*; <https://www.mla.com.au/news-and-events/industry-news/case-study-the-role-of-biosecurity-in-industry-sustainability/>; viewed 31/08/2022.

²⁰ Animal Health Australia (2019); *National Sheep Industry Biosecurity Strategy*

²¹ QFF (2022); *Jev raises biosecurity and pest management concerns*; <https://www.qff.org.au/presidents-column/jev-raises-biosecurity-pest-management-concerns/>; viewed 15/03/2022.

workforce needs to continue skilling in biosecurity practices and management so that workers can identify signs of disease, where to report suspected incidences, and how to take steps in protecting animals, controlling pests, and ensuring worker safety.

Sustaining plants and animals

The Agriculture and Production Horticulture industry is founded upon cultivating, growing and utilising plants and animals, which are biological substances and entities. In common with the human health and services industries, there is an expectation that Agribusiness, Food and Fibre workers will have the skills required to deal with the complexities of caring for living bodies.

Plants

Sustaining plants and crops requires the development of sophisticated skills and knowledge. Depending on what is being harvested and where growers need to be able to carry out sowing, soil sampling and testing, crop rotation, irrigation, and pest, disease and weed control. There are also areas that require additional skills for navigating business management and regulatory system challenges. An example of this complexity was in the recent development of training package products for medicinal cannabis, an emerging market in Australia. While it was anticipated that existing horticulture training package products could be augmented with minimal additions, it became apparent through consultation that, for this product to be prepared for human therapeutic purposes, there were substantial additional knowledge and growing method requirements. There was additionally a need to meet complex licensing requirements and to address high-level security issues. This resulted in the Australian Industry and Skills Committee (AISC) endorsing the release of two qualifications and additional skill sets.

The complex care associated with conservation and ecosystem management is addressed under '**Ecosystem Management, Continuing Climate Adaptation and Carbon Capture and Storage**' below.

Animals

Looking after animals, like caring for humans, is fundamentally different from tending to machinery, equipment and infrastructure, and requires skills that take into account the biological complexities and behavioural variability that animals demonstrate. Agriculture and Production Horticulture stakeholders have been key contributors in articulating animal welfare standards across the value chain, which are described in both industry-wide and sector-specific standards:

- *Animalplan 2022 to 2027* will be Australia's first national action plan for agricultural animal health. The plan consolidates topics from numerous current frameworks, strategies and plans, and proposes priority animal health activities that were determined through engagement with governments, industry organisations and animal health experts²². The *Animalplan* is also intended to support the National Farmers' Federation's '\$100 billion by 2030' goal
- Sheep: following the introduction of animal welfare regulatory changes to manage heat stress in live sheep exports to the Middle East, there was an almost 80% reduction in sheep mortality in 2019 compared to the average for the previous six years²³
- Poultry: The federal government is working with the states and territories to develop and implement nationally consistent standards and guidelines for farm animal welfare, and the Australian Animal Welfare Standards and Guidelines for Poultry will replace the Model Code of Practice for the

²² Australian Government (2022); *Animalplan 2022 to 2027: Australia's National Action Plan for Terrestrial Agricultural Animal Health*; www.awe.gov.au/animal-plan; viewed 18/07/2022.

²³ Australian Government (2021); *Live animal export trade*; <https://www.awe.gov.au/agriculture-land/animal/welfare/export-trade>; viewed 18/07/2022.

Welfare of Animals Domestic Poultry²⁴. The chicken meat industry has also developed guidelines in 2020 to minimise the risks associated with potential production system closures and to guarantee suitable monitoring of animal welfare during substantial business disruptions, as seen with COVID-19²⁵

- Goats: in collaboration with Animal Health Australia, the Goat Industry Council of Australia, reviewed and developed the Australian Industry Welfare Standards and Guidelines for Goats in 2019-2020 and released a tool to enable industry uptake of best-practice animal welfare, improve production and maintain market access²⁶.

Ecosystem Management, Continuing Climate Adaptation and Carbon Capture and Storage

In Agriculture and Production Horticulture, farmers and landowners are stewards of the land on which they work, and maintain much of Australia's natural capital, including trees and grasslands. A large proportion of farmland is under family farm arrangements, and the sustainability of this land is their long-term asset.

Biodiversity is fundamental to environmental sustainability as it helps to regulate climate, water quality, pollination, animal and plant health and habitats, flooding, and storm surges. The leading driver of biodiversity loss in recent decades has been population growth, which requires greater areas of land to be farmed to provide food (please also see the *Agribusiness, Food and Fibre Industries Skills Report* for discussion of the *Australia State of the Environment 2021* report). For the Agriculture and Production Horticulture industries, the challenge is to use increasingly sustainable practices to produce the food we need while conserving and managing biodiversity.

Farmers, as managers of the land and environment, are seeking to formalise their best-practice activities, but many small- and medium-sized farms experience difficulties in gaining recognition.

'Farmers have always been frontline stewards of Australia's environment, managing 51% of our continent's landmass. Unfortunately, efforts to incentivise and reward environmental practices historically have been short-term or based on ad-hoc grants and programs. They have also been interfered with through complex and poorly understood regulatory requirements. We need a comprehensive approach that delivers the right incentives, and the right outcomes for farmers and the environment.'

Fiona Simson, NFF President

National Farmers' Federation (2019); NFF & KPMG reveal opportunities to unlock new income for farmers; <https://nff.org.au/media-release/nff-kpmg-reveal-opportunities-to-unlock-new-income-for-farmers/>

Initiatives to support ecosystem management leadership across regional industries include the *Australian Agricultural Sustainability Framework*²⁷, due for release in 2022. The Federal Government Department of Agriculture, Water and Environment (DAWE) has provided \$4m in funding to the National Farmers' Federation to develop and trial the Framework, which is being designed with respect to three interrelated themes to support regional businesses of all sizes in their roles as stewards of the environment and contributors to regional economies and communities:

²⁴ Australian Government (2022); *Australian Animal Welfare Standards and Guidelines for Poultry*; <https://www.awe.gov.au/agriculture-land/animal/welfare/standards-guidelines/poultry>; viewed 23/08/2022.

²⁵ AgriFutures Australia (2020); *Effective stunning and slaughter for poultry training workshops*; <https://agrifutures.com.au/related-projects/effective-stunning-and-slaughter-for-poultry-training-workshops/>; viewed 23/08/2022.

²⁶ Animal Health Australia (2020); *Australian Industry Welfare Standards and Guidelines – Goats*

²⁷ National Farmers' Federation (2022); *Australian Agricultural Sustainability Framework*; <https://nff.org.au/programs/australian-agricultural-sustainability-framework/>; viewed 09/03/2022.

Figure 1: Australian Agricultural Sustainability Framework themes



Source: Australian Farm Institute (2022); Australian Agricultural Sustainability Framework; <https://www.farminstitute.org.au/product/aasf-australian-agricultural-sustainability-framework/>; viewed 09/03/2022.

The objectives for the Framework include:

- to integrate productivity, sustainability, and biodiversity in regional industries to provide lasting benefits for businesses and the community; and
- to ensure primary producers can demonstrate best practice sustainability/biodiversity management of natural resources – and ensure these actions are identifiable by supply chains, markets, investors, the community and other regional operators and collaborators.

Articulating national standards is intended to facilitate a new sustainability paradigm, which will encourage and empower more businesses to develop increasingly sophisticated implementation skills and knowledge.

Such frameworks also support the implementation of methods that harness natural capital. In 2020, the federal government launched the Environmental Stewardship Program as part of the National Landcare Program to provide support for stewardship activities²⁸. This contains the four-year, \$34 million Agriculture Stewardship Package²⁹, with objectives to improve agriculture’s social license by incentivising the adoption of ecosystem-boosting practices.

Responding to this new emphasis, farmers are looking to harness the benefits of their natural capital³⁰. An emerging methodology is regenerative agriculture, a system of farming principles and practices that increases biodiversity, enriches soils, and improves watersheds, resulting in sustainable production and resilience to change. A project commissioned by the federal government concluded that regenerative management has ‘the potential to increase the health of Australia’s grassy woodlands and at the same time improve financial and farmer wellbeing’³¹.

There is a strong link between regenerative agriculture and various other methods and systems that are attracting consumer and, therefore, producers’ attention, for example, permaculture, the circular economy, biological farming, carbon farming and organic farming. Such holistic farming systems and practices are becoming increasingly important as the world adapts to and counters climate change, and consumer demand for best-practice agricultural products rises. There is likely to be strong interest in training and education in these methods, especially to build on school-level learning, and bridge the gap to science-focussed university curricula through the delivery of applied skills training.

²⁸ Australian Government (2020); *Environmental Stewardship Program*; <http://www.nrm.gov.au/national/continuing-investment/environmental-stewardship>; viewed 09/03/2022.

²⁹ Australian Government (2020); *Sustaining the Future of Australian Farming*; <https://www.agriculture.gov.au/about/reporting/budget/sustaining-future-australian-farming>; viewed 09/03/2022.

³⁰ Australian Farm Institute (2019); *Valuing Agriculture’s Natural Capital*

³¹ ABC News (2019); *Regenerative agriculture finds solid backing as decades of success show renewal*; <https://www.abc.net.au/news/rural/2019-03-10/regenerative-agriculture-attracts-solid-backing-amid-success/10871130>; viewed 09/03/2022.

Aboriginal and Torres Strait Islander Custodianship

Traditional land management strategies play an important role in the preservation and maintenance of the natural ecosystems, Indigenous culture and heritage, and wildlife habitats. Please see the *Agribusiness, Food and Fibre Industries Skills Report* for more details on the growing demand for effective training to help develop the skills and knowledge to implement these management strategies.

Climate and carbon

Farmers for Climate Action³² note that climate change is raising the risk of food shortages associated with extreme weather events and pandemics. Climate change is seeing fewer supplies on supermarket shelves, increasing food prices, reduced availability of some products, and decreasing the nutritional value of staples such as wheat and rice. Problems arise not from a lack of food being produced but rather disruptions to the value and supply chains required for its distribution. Farmers for Climate Action note that many businesses in the Australian food value chain are already actively implementing climate change strategies. To alleviate negative impacts from climate change, they recommend four categories of skills, knowledge and action required of governments and businesses:

- Resilience
 - Requiring improved transport connections and associated infrastructure; food storage and stockpiles; and shorter supply chains.
- Risk management
 - Governments have an important risk management role in helping address gaps in data and information on climate change impacts, to allow businesses to plan more effectively.
- Adaptation
 - Examples include: grains production moving away from monocultures to more diverse cropping and planting genetically diverse varieties; horticulture moving locations and mixing production as climate changes regional ecosystems; the dairy industry utilising genetically modified herds; investment in new equipment, electrification, and other changes to business practices.
- Mitigation
 - The process of slowing or reversing human-induced global warming, involving reducing greenhouse gas emissions, or enhancing 'sinks' that store greenhouse gases in vegetation and soil.

In its report on *Future-proofing the Australian grains sector*, Australian Farm Institute confirms the importance of climate change action to the agricultural sectors by linking mitigation strategies to profitability. A lack of action would not only affect future crop yields and the environmental but also, in turn, productivity and commercial prospects:

'First and foremost, the grains industry must recognise the existential threat posed by climate change to sectoral productivity and profitability as the primary driver for carbon neutrality. Compounding this fundamental threat, a failure to proactively move to net zero targets could see the industry 'locked out' of key trading markets and the supporting business environment.'

K. McRobert, R. Heath & T. Fox (2022); Future-proofing the Australian grains sector; Australian Farm Institute; p. 1

Each sector within agriculture encounters distinct challenges and opportunities pertaining to emissions

³² Farmers for Climate Action (2022); *Fork in the Road: Impacts of Climate Change on Our Food Supply*

reduction. Debates on the 'cost vs benefits' of climate action often becomes politicised and divides opinion. However, climate change is already impacting on agricultural productivity (see **Natural disaster planning, response and recovery**) and determining Australia's trading status with the rest of the world.

While businesses may struggle to obtain appropriate levels of knowledge and skills – and capital – to implement systems and practices to achieve net zero targets, actions towards these 'should be regarded as investments with powerful dividends in future performance'³³.

Initiatives to support farmers that are already underway include Drought Resilience Adoption and Innovation Hubs³⁴. Eight hubs across Australia are supporting drought preparedness by connecting farmers with regional agricultural experts, and innovative and new practices. Each hub retains a Knowledge Broker, who can help operators translate theory into practice relating to such activities as:

- on-farm trials of transformational technologies and practices
- training farmers in the use of decision-support tools
- upskilling farmers in innovation, entrepreneurship, and commercialisation.

Water and soil

Water

Water and soil issues remain at the forefront of Agriculture and Production Horticulture planning. Water is a crucial but scarce resource, exemplified by Australia's status as the driest inhabited continent on earth. This has led to rising water prices, as well as unequal and inconsistent access to water at different times and under different conditions for different businesses.

Water trading and regulation is a growing sector in Australian agriculture. Water trading has evolved into a multifaceted market with an annual value estimated at more than \$1.5 billion. The Bureau of Meteorology describes that, 'Water markets facilitate the buying and selling of water entitlements and allocations to allow water to move between various rural, agricultural, and environmental uses. However, in Australia, water trading occurs mainly between agricultural users'³⁵. The Australian Competition & Consumer Commission (ACCC)³⁶ reports that, across agribusiness, fragmented understanding of changing water markets is undermining their efficiency and regulatory compliance. One of the recommendations of the Keely Report³⁷ into management of Murray-Darling Basin water resources was to incorporate water literacy into education, including via VET. A project is underway to develop training products that will deliver skills to understand and work within the complex regulatory environment, as well as negotiate and trade water for all purposes across Australia³⁸.

Water efficiency is strongly linked to the social licence of different sectors. The rice sector, for example, is known as highly water-intensive, which creates issues associated with water access and social concerns. The comparative profitability of rice-producing businesses (which typically also grow other crops with irrigation water, such as cotton) tends to be variable from year to year due to water and commodity prices

³³ K. McRobert, R. Heath & T. Fox (2022); *Future-proofing the Australian grains sector*; Australian Farm Institute; p.1

³⁴ Australian Government (2022); *Drought Resilience Adoption and Innovation Hubs*; <https://www.awe.gov.au/agriculture-land/farm-food-drought/drought/future-drought-fund/research-adoption-program/adoption-innovation-hubs>; viewed 03/06/2022.

³⁵ Bureau of Meteorology (2021); *Water in Australia 2019-20*; p.43.

³⁶ Australian Competition and Consumer Commission (2020); *Murray–Darling Basin water markets inquiry - Interim report*

³⁷ Interim Inspector-General of Murray–Darling Basin Water Resources (2020); *Impact of lower inflows on state shares under the Murray–Darling Basin Agreement*; Canberra. CC BY 4.0.

³⁸ Skills Impact (2021); *Water Allocation & Entitlement Skills Project*; <https://www.skillsimpact.com.au/agriculture/training-package-projects/water-allocation-entitlement-skills-project/>; viewed 17/02/2022.

and seasonal conditions³⁹. To combat the challenges experienced by rice growers, the industry has set an ambitious target of improving water efficiency by 75% by 2026⁴⁰. This target is to future-proof Australian rice growers against the severe impacts of drought, the most significant challenge facing the sector. To support farmers during the transition, research and development corporations are developing new varieties of rice that require less water, have greater cold tolerance, and larger yields (as part of 'aerobic rice production systems')⁴¹.

Soil

Research, including by the Soil Cooperative Research Centre⁴², has found that many farmers experience soil problems, such as erosion and low biological activity, leading to production losses. Education and knowledge translation is considered a key driver for addressing these issues. However, many farmers are yet to invest in developing the business management skills to enable effective land management decisions that would secure long-term sustainability.

The *National Soil Strategy 2021 – 2041* ('the Strategy') envisages that 'Australia's soil is recognised and valued as a key national asset by all stakeholders', and that skills and knowledge are developed 'to benefit and secure our environment, economy, food, infrastructure, health, biodiversity, and communities – now and in the future'⁴³. One of three key goals of the Strategy is to 'Strengthen soil knowledge and capability', which would enable better decision-making for sustainably managing farmland, and the measurement and sharing of outcomes to verify and promote returns on investment. The Strategy reports that, at present, more action is needed to attract people to, and retain them in, occupations requiring soil-related skills and knowledge. It recommends that efforts to address this should include RTOs ensuring the alignment of curricula with new career opportunities and industry needs. Further initiatives may also consider delivering a greater diversity of soil-related training, including programs to appropriately engage with and apply Aboriginal and Torres Strait Islander Traditional Knowledge in soil science.

Industry participants, governments, and research organisations are now taking steps to learn about, promote and support better soil health, including:

- At the 2022 Ag Innovation Expo, farmers and land managers shared new techniques and products to improve soil management and lead to increased fertility, improved soil nutrient levels and disease suppression⁴⁴.
- In January 2022, the Australian Government announcement an extra \$3 million for Drought Resilience Adoption and Innovation Hubs to host Regional Soil Coordinators, whose role is to support farmers in increasing their productivity, profitability, and sustainability⁴⁵.
- Rising fertiliser prices have created massive production cost pressures for farmers. This has seen some businesses replace a reliance on chemical fertilisers with more economically and ecologically sustainable methods. These include using composting to catalyse microbial growth and aerate poor

³⁹ ABARES (2021); *Australian rice markets in 2020*; <https://www.awe.gov.au/abares/research-topics/agricultural-outlook/rice>; viewed 17/02/2022.

⁴⁰ ABC News (2022); *The rice industry aims to improve water efficiency by 75 per cent by 2026*; <https://www.abc.net.au/news/2022-03-02/rice-industry-sets-ambitious-water-efficiency-target/100871450>; viewed 02/03/2022.

⁴¹ AgriFutures Australia (2021); *Rice genetics the key to water efficient production*; <https://agrifutures.com.au/news/rice-genetics-the-key-to-water-efficient-production/>; viewed 03/08/2021.

⁴² H. Luke, C. Baker, C. Allan & S. McDonald (2020); *Agriculture on the Eyre Peninsula: Rural Landholder Social Benchmarking Report 2020*; Southern Cross University, NSW, 2480.

⁴³ Australian Government (2021); *National Soil Strategy*; p.2

⁴⁴ Premier of Tasmania (2022); *Future of agriculture on display at 2022 Ag Innovation Expo*; https://www.premier.tas.gov.au/site_resources_2015/additional_releases/future_of_agriculture_on_display_at_2022_ag_innovation_expo; viewed 28/04/2022.

⁴⁵ Australian Government (2022); *Drought Resilience Adoption and Innovation Hubs*; <https://www.awe.gov.au/agriculture-land/farm-food-drought/drought/future-drought-fund/research-adoption-program/adoption-innovation-hubs>; viewed 03/06/2022.

soil, and responsibly utilising biosolids (the by-product of sewage treatment plants)⁴⁶.

- Australian soils are generally carbon poor but that there are opportunities for carbon sequestration that improves soil productivity, resistance to drought, and delivers a pathway towards net zero greenhouse gas emissions (GHG)^{47,48}. A paper abstract by Alex McBratney, Budiman Minasny and José Padarian of the University of Sydney Institute of Agriculture states what skills are needed now and for the future:
 - 'Soil carbon increase is a worthwhile goal in farm-business management. It can improve ecosystem services, productivity resilience, and may help to diversify income streams. [...] Offsetting may be the way forward for the near future. Insetting soil carbon to achieve farm business carbon balance may become the bigger priority in the next five years and income-generating certification schemes which recognise the more general ecosystem benefits of soil carbon will become a universal option. Baselineing farm soil carbon now would seem to offer the most flexible way to optimise future options.'

A. McBratney, B. Minasny & J. Padarian (2022); Soil carbon: the complexity of offsetting, inseting or resetting; Farm Policy Journal Vol. 19, No. 1: Autumn Quarter 2022; p.4

Digital & Automation Practices

Please see the *Agribusiness, Food and Fibre Industries Skills Report* for additional information and data on digital and automation practices, including the *Agricultural Workforce Digital Capability Framework*, drone usage, digital ecosystems (including connectivity issues in regional areas) and digital and automation skills delivery.

Transforming Practices

Digital technologies are having a transformative effect on Agriculture and Production Horticulture. Precision agriculture utilises digital technologies, including automation, sensors, data collection and processing, satellites, and mapping. Adoption of such technologies is to increase crop yields, reduce input costs, compensate for labour shortages, and maintain environmental assets. In the context of these developments, it is estimated that 'in the next ten years one in three new jobs created in Agriculture, Forestry and Fishing will be tech related'⁴⁹.

At the 2022 ABARES Conference, Craig Bailey (University of Southern Queensland) presented on 'game-changing' technologies in agriculture, including:

- Data analytics and AI
 - Robotics; smart equipment; big data; machine learning; predictive tools; connected supply and value chains
- Farm management software, sensing and Internet of Things
 - Protocols for data exchange; technologies linking software and control; GIS based software providers

⁴⁶ ABC News (2022); Soil health in focus as fertiliser prices soar and farmers look for alternatives; <https://www.abc.net.au/news/rural/2022-05-17/alternative-soil-fertilisers-for-sustainable-farming/101070806>; viewed 17/05/2022.

⁴⁷ Grain Central (2022); *Australia well placed in green space: ABARES*; <https://www.graincentral.com/trade/australia-well-placed-to-maximise-green-credentials-abares/>; viewed 09/03/2022.

⁴⁸ Australian Farm Institute (2022); Upsides, offsites, blindsides: considerations for an ag offsets market; *Farm Policy Journal* Vol. 19, No. 1: Autumn Quarter 2022; p.2

⁴⁹ KPMG and Skills Impact (2019); *Agriculture Workforce Digital Capability Framework*; p.48

- Automation to autonomy
 - Data collected and stored on cloud servers, typically for machine diagnostics and monitoring; data on farming inputs such as crop yield variables to provide insights; smaller, multiple machines, such as robot swarms with high degrees of autonomy³
- Novel farming systems
 - Urban farms with vertical crop plantations, controlled light and environmental conditions; individual plant management through AI, automation and robotics; use of less land, water and pesticides, but gaining higher yields.

There are various benefits from adopting digital technologies⁵⁰. Robotics can help improve operational efficiencies and productivity, and support workplaces in the following ways:

- work can continue 24 hours a day, regardless of the weather or disruptions caused by events such as pandemics
- repetitive, boring, physically demanding, and unsafe tasks can be automated, therefore improving workplace WH&S
- tasks can be standardised such that they are completed with greater speed and accuracy
- precise data can be monitored and contribute to traceability and sustainability records
- following high initial set-up costs, efficiency and profitability can be increased
- workplaces impacted by labour shortages may implement digital solutions, which creates augmented and new employment opportunities.

With digital transformation underway, industry is experiencing various barriers to the wider and quicker implementation of digital technologies. Current challenges, limitations or concerns for industry include:

- affordability and investment capital
- an absence of skills and training services for teaching people to operate digital machinery effectively
- challenges establishing digital infrastructure plans (hardware and software)
- power source requirements and low internet connectivity
- an absence of local suppliers
- expensive consulting fees for agronomists with specialist digital skills
- servicing and maintenance requirements: issues include both skills gaps and ambiguities over owners' legal right to maintain and repair machinery⁵¹
- safety concerns when processes are automated
- data management, cyber-security, and intellectual property issues.

Due to these barriers, the *National Agriculture Workforce Strategy* reports that there is presently a low level of digital maturity across the Agriculture and Production Horticulture industries, which must be addressed through leadership and strategic direction and infrastructure development (including connectivity)⁵².

⁵⁰ Queensland Government (2022); *Robots*; <https://www.daf.qld.gov.au/agtech/be-inspired/future-trends/robots>; viewed 31/08/2022.

⁵¹ Countryman (2021); *Tractor and Machinery Association of Australia supports right to repair with caveats*; <https://www.countryman.com.au/countryman/machinery/tractor-and-machinery-association-of-australia-supports-right-to-repair-with-caveats-ng-b881939358z>; viewed 31/08/2022.

⁵² J. Azarias, R. Nettle & J. Williams (2020); *National Agricultural Workforce Strategy: Learning to excel*; National Agricultural Labour Advisory Committee; Canberra, December; p.102

Raising the capabilities of the workforce is also acknowledged as a vital solution to implementation barriers. Using tools such as the *Agricultural Workforce Digital Capability Framework*⁵³ will enable industry to understand the digital skills required and to address any gaps in the abilities of the workforce to meet future demand. It also provides education providers with a framework for developing education pathways to upskill the workforce and aid decision-making on the adoption of new technology. In some cases, this involves bridging theoretical knowledge and skills for the practical application of technologies. This informed the development of a nationally recognised qualification, *Diploma of Applied Agronomy*, which is to assist farmers and business operators to identify and source technology to meet their needs⁵⁴.

It should be noted that each agribusiness has a unique situation with respect to variables such as sector (i.e., what is produced), geography, climate and capital. Each farm, therefore, is currently in different stages of its business plan and technological development – including traditional family farms, early adopters of innovative practices and technologies, and everything in between. It is crucial that skills and training providers are agile enough to contextualise educational offerings appropriate to the circumstances of the customer, while, ideally, advancing knowledge of best-practice systems.

Environmental regulations, codes of practice and guidelines

Sectors within Agriculture and Production Horticulture face specific environmental regulations, codes of practice and guidelines which need to be addressed through skills development.

Please see the *Agribusiness, Food and Fibre Industries Skills Report* and *AHC Training Package Companion Volume Implementation Guide*⁵⁵ for more details on conservation legislation; environmental regulations; regulation of genetically modified crops; livestock management legislation; the Australian ruminant feed ban; the Agriculture and Veterinary Chemical Regulatory Framework (Agvet); industry codes of practice; and information on regulated occupations.

Workplace and Value Chain Risk Management and Safety Culture

Across the Agriculture and Production Horticulture industries, numerous strategies are being implemented to support and improve workplace safety outcomes. The industry has been identified as a high-risk industry and recent legislative changes have emphasised the need to improve workplace practices.

Workplace safety

Workplace safety is of particular concern in these industries due to the specific environments, tools and animals that people work with. Examples of situations requiring heightened safety precautions include arborists working at height, working with and transporting livestock, using agricultural and veterinary (agvet) chemicals and operating quad bikes and side-by-side vehicles.

Workplace safety awareness and skills are especially crucial for employee cohorts who are most at risk. Among workers, people 50 years of age and over accounted for almost 50% of all on-farm non-intentional injury deaths between 2001 and 2015. The death of Aboriginal people by injury occurs at three times the rate of non-Aboriginal farm workers, especially from transport incidents, drowning and poisoning. Acknowledging these high rates of injury and death requires that employees are engaged in safety programs with appropriately targeted and culturally relevant injury prevention resources and strategies.

⁵³ KPMG and Skills Impact (2019); *Agriculture Workforce Digital Capability Framework*

⁵⁴ Skills Impact (2019); *Agronomy Project*, <https://www.skillsimpact.com.au/agriculture/training-package-projects/agronomy-project/>; viewed 31/08/2022.

⁵⁵ Australian Government (2022); *VETNet: Agriculture Horticulture and Conservation and Land Management Training Package*; <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72>; viewed 31/08/2022.

They must be inclusive of measures for the protection of self and others, such as children, who account for almost 15% of farm injury deaths⁵⁶.

In recent years, there have been various high-profile farm safety awareness and education initiatives to help prevent accidents. Farmsafe has released a National Farm Safety Education Fund Strategy, aimed at significantly reducing injuries and fatalities in agriculture by 2030, while the National Farmers' Federation⁵⁷ has set a goal for 90% of Australian farms to be employing risk management tools by 2030, including through education and training.

Safety measures across industries are continually being reviewed and updated by state and federal governing bodies. For example, in Queensland, the Office of Industrial Relations is currently investigating the introduction of regulations to improve the safety of workplace employees and others when operating quad bikes and side-by-side vehicles (SSV)⁵⁸. Research indicates that many operators overestimate their driving abilities, while underestimating the inherent risks of operating quad bikes and SSVs. Nationally, there were 64 quad bike fatalities between 2017 and 2021, with at least 22 of these work-related (which is greater than the number of fatalities associated with being trapped by moving machinery).

A 2015 coronial inquest in Queensland examined deaths caused by quad bike accidents and, since then, several safety initiatives, awareness campaigns and changes have been implemented to influence rider safety behaviours, including training and education during field days and workshops. Coroners in New South Wales and Tasmania have made similar recommendations for mandatory regulation. At present, national regulations have not been agreed.

Following these coronial inquests, *AHC Training Package* units of competency for operating quad bike and SSVs were created in 2018, notably *AHCMOM217 - Operate quad bikes* and *AHCMOM216 - Operate side by side utility vehicles*. Many regulators actively encourage workers to undertake these units to develop the skills and knowledge to safely operate these vehicles, manage risks, and use appropriate personal protective equipment.

Natural disaster planning, response and recovery

Drought, floods, and bushfires create massive social and economic challenges that threaten the continuity of industry sectors, businesses and workforces, and have severe impacts on peoples' mental health. During such times, there is increased demand for workers to carry out response and recovery work to help businesses re-establish disrupted operations; yet many of the seasonal workers who populate Agriculture and Production Horticulture may have moved on to guarantee continued income.

There are also implications for workforce skills because training delivery may be discontinued when RTOs' property and employees are similarly affected by events such as floods. Workplace training delivery is also likely to be halted when businesses are grappling with the response and recovery from extreme events; and affected stakeholders' ability to participate in training package review and development work is curtailed. This situation is exacerbated because fewer workers or trainers will choose to relocate to the affected areas, especially when housing and food supplies are disrupted.

Responses to these situations requires a well-trained workforce and public awareness. Improving risk management strategies and enhancing the overall safety cultures across industries, especially in regional, rural and remote Australia, is likely to mitigate some of the devastating effects of future natural disasters on both populations and industries. Industry Reference Committees have advised that the Australian skills and

⁵⁶ AgHealth Australia (2021); *Projects – populations at risk*; The University of Sydney; <https://aghealth.sydney.edu.au/projects-and-reports/projects-populations-at-risk/>; viewed 01/09/2021.

⁵⁷ National Farmers' Federation (2021); *NFF completes farm risk management study*; <https://nff.org.au/media-release/nff-completes-farm-risk-management-study/>; viewed 01/09/2021.

⁵⁸ Workplace Health and Safety Queensland (2022); *Quad bikes and side-by-side vehicles safety – Proposed work health and safety regulations*

training system can do more to ensure the critical skills for planning, response, and recovery, including through the creation of skills sets for swift and targeted upskilling of impacted workers.

Floods

Floods, which have coincided with the start of the 2022 horticulture production period, have impacted significantly on Agriculture and Production Horticulture businesses. Widescale issues include:

- crop losses
 - crop farmers in northern New South Wales lost entire crops worth millions of dollars after floodwaters completely submerged hundreds of hectares of soybean, rice, cane and macadamia farms⁵⁹.
- livestock losses
- machinery losses and property damage
- waterlogging, silt build-up, and the need to repair and re-level farmland (often at great expense and time)
- invasive species, such as fire ants, colonising new areas after been transported by flood waters, and creating new biosecurity risks⁶⁰
- losing seasonal workers during maintenance work and production delays
- having to source and upskill new staff to fill the gaps left by departed workers, which creates further issues associated with productivity loss during peak harvest time⁶¹.

To provide flood assistance, the NSW Department of Education is repurposing a portion of the remaining AgSkilled program funding to flood recovery efforts, including for training on fencing, flood defence and rebuilding agricultural livelihoods.

Recovery efforts by industry stakeholders are continuing and have created significant additional pressures compared with 'normal' business operations. The demand for new training delivery, or continuing established programs, has been impacted, and affected stakeholders' ability to offer time to support training package development work has diminished.

The need for relevant skills and knowledge has become even more crucial in these uncertain and challenging times, necessitating that more proactive – rather than reactive – training is delivered in anticipation of these increasingly frequent disasters.

⁵⁹ ABC News (2022); *Northern NSW farmers face total crop losses after widespread flooding*; <https://www.abc.net.au/news/2022-03-03/northern-nsw-crop-flood-damage/100875454>; viewed 03/03/2022.

⁶⁰ The Guardian (2022); *The ants go rafting: invasive fire ants take to Australian flood waters to colonise new areas*; <https://www.theguardian.com/australia-news/2022/apr/12/the-ants-go-rafting-invasive-fire-ants-take-to-australian-flood-waters-to-colonise-new-areas>; viewed 12/04/2022.

⁶¹ ABC News (2022); *Calls for JobKeeper style support as flood-impacted Lockyer Valley farmers battle to keep staff during rebuild*; <https://www.abc.net.au/news/rural/2022-05-25/farm-worker-support-call-for-lockyer-valley-farmers-hit-by-flood/101095236>; viewed 25/05/2022.

Industry Summary and Trends

Workforce, Business and Market Summary

The Agriculture, Horticulture, Conservation and Land Management industries contribute to Australia's food security, health, and wellbeing. They produce essential food products and work with and protect Australia's environmental assets, now valued at more than \$6.5 trillion according to the ABS⁶² and CSIRO⁶³.

The Agriculture, Horticulture, Conservation and Land Management industries account for almost half a million employees. Around 184,000 individual businesses operate and trade in locations spanning all states and territories, and comprise a variety of small, medium, and large enterprises. The sectors across these industries are extremely varied, with large agribusinesses, as well as niche, specialist, and regional operators. Overall, the Agriculture, Horticulture, Conservation and Land Management industries have a total revenue of over \$171 billion and contribute almost \$43 billion to overall GDP ('industry value added').

Table 1: Industry Financial Activity

Training Package-Related Industries	Revenue (\$billion)	Industry Value Added (\$billion)	Businesses	Employment
Agriculture, Horticulture and Conservation and Land Management	\$171.18	\$42.78	184,186	499,054

Source: IBISWorld Industry Wizard

As with all industries since the start of 2020, Agriculture and Production Horticulture have experienced disrupted supply chains and labour supplies because of the COVID-19 pandemic; however, the robust adaptations, innovations, and evolution of these 'essential industries' mean that, in spite of on-going challenges, they are thriving⁶⁴.

Over 90% of daily food consumed in Australia is provided by Australian farmers and associated food producers and processors within the value chain⁶⁵, seeing the gross value of production reach an all-time high⁶⁶. Australia is one of the most food secure nations in the world, with around 71% of 'agriculture, forestry and fisheries' products being exported because there is substantially more food produced than consumed across the nation⁶⁷.

Such trends ensure the products, services and economic contributions of Agriculture and Production Horticulture businesses continue to grow. While these industries are playing a critical role in rebuilding Australia's economy following the most severe impacts of the pandemic, however, their contributions are constrained skilled worker shortages, especially in regional, rural and remote areas. The *National Agricultural Workforce Strategy* notes that the best way of future-proofing industry is by preparing all levels of the workforce through 'learning in all its forms, at all levels, in all the relevant parts of the nation'⁶⁸. Such

⁶² ABS (2019); 4655.0 - Australian Environmental-Economic Accounts, 2019; <https://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4655.0Main%20Features22019?opendocument&tabname=Summary&pr odno=4655.0&issue=2019&num=&view=>; viewed 22/02/2022.

⁶³ CSIRO (2020); *Australia's Biosecurity Future*

⁶⁴ R. Heath (2021); Editorial: Ag thriving in disruption; *Farm Policy Journal Vol. 18, No.2, Winter Quarter 2021*

⁶⁵ Department of Agriculture, Water and the Environment (2021); *Delivering Ag2030*; Canberra, May. CC BY 4.0.

⁶⁶ ABARES (2021); Agricultural Commodities: December quarter 2021; Canberra. CC BY 4.0

⁶⁷ ABARES (2020); Australian food security and the Covid-19 pandemic; Canberra. CC BY 4.0.

⁶⁸ J. Azarias, R. Nettle & J. Williams (2020); *National Agricultural Workforce Strategy: Learning to excel*; National Agricultural Labour Advisory Committee; Canberra, December. CC BY 4.0; p.xiii.

capabilities development will unlock opportunities, including through the improved use of knowledge, practices, and technologies, for realising the National Farmers' Federation's plan for agriculture becoming a \$100 billion industry by 2030.

Please see the *Agribusiness, Food and Fibre Industries Skills Report* for additional information on industry workforce demographics, including diversity and educational attainment.

Shortage of skilled workers and skills priorities

There are widespread skills shortages across all sectors of the Agriculture and Production Horticulture industries, jeopardising the short- and long-term viability of many businesses. Such issues are both reflective of the impacts of COVID-19 on international workers' entry to Australia and longstanding concerns associated with an ageing workforce.

The National Skills Commission (NSC) regularly reviews the national skills needs of Australia and, from June 2021, has responsibility for releasing a Skills Priority List (SPL) annually. A key element of the SPL is the determination of occupational shortages. This is when employers are 'unable to fill or have considerable difficulty filling vacancies for an occupation or cannot meet significant specialised skill needs within that occupation, at current levels of remuneration and conditions of employment and in reasonably accessible locations'⁶⁹.

Occupational shortages designated by the NSC for Agriculture and Production Horticulture are:

Table 2: Skills Priority List Occupations

ANZSCO Code	Occupation	Current national shortage overall?	Future demand (five-year period)
234111	Agricultural Consultant	Yes	Strong
234112	Agricultural Scientist	Yes	Strong
361211	Shearer	Yes	Strong
721111	Agricultural and Horticultural Mobile Plant Operators	Yes	Strong
121216	Mixed Crop Farmer	Yes	Soft
121318	Pig Farmer	Yes	Soft
121215	Grape Grower	Yes	Soft
121321	Poultry Farmer	Yes	Soft
311111	Agricultural Technician	Yes	Moderate
121313	Dairy Cattle Farmer	No (shortage in SA, TAS & NT)	Soft
121217	Sugar Cane Grower	No (shortage in QLD)	Soft
121214	Grain, Oilseed, or pasture Grower	No (shortage in NT)	Soft
121311	Apiarist	No (shortage in NSW & NT)	Soft
841913	Pest Controller	No	Strong
233912	Agricultural Engineer	No	Moderate
399917	Wool Classer	No	Moderate
611112	Stock and Station Agent	No	Moderate
121211	Cotton Grower	No	Soft

⁶⁹ National Skills Commission (2021); *Skills Priority List Methodology*; p.5

121212	Flower Grower	No	Soft
121213	Fruit or Nut Grower	No	Soft
121221	Vegetable Grower	No	Soft
121212	Beef Cattle Farmer	No	Soft
121314	Deer Farmer	No	Soft
121315	Goat Farmer	No	Soft
121317	Mixed Livestock Farmer	No	Soft
121322	Sheep Farmer	No	Soft
121411	Mixed Crop and Livestock Farmer	No	Soft

Source: National Skills Commission (2021); Skills Priority List

Feedback from industry stakeholders suggests that regional and state-based shortages are more severe than the NSC represents. Stakeholders also report that, on top of the above in-demand occupations, farm businesses are experiencing difficulties in hiring people in leadership and middle-management roles, such as farm managers and irrigation managers.

In addition to occupational shortages, industry operators have been describing skills gaps and needs, including a range of technical and employability skills, that are common across all sectors of the Agriculture and Production Horticulture industries. As part of their workforce planning activities, the Queensland Farmers' Federation (QFF) and Rural Jobs and Skills Alliance (RJSA) have identified skills gaps across the industry relating to the general enterprise workforce. These are:

Skills gaps identified by the Queensland Farmers' Federation and Rural Jobs & Skills Alliance

1. Work ready skills (Entry Level)
 - Preparing to work
 - Starting work
 - Work culture

2. Leadership skills (Medium Level)
 - Becoming a team leader
 - Communication and conflict resolution
 - Planning and time management
 - Understanding production systems

3. Skills to manage business risk (Higher Level)
 - Financial understanding
 - Decision making
 - Sustainability, climate change
 - Digital infrastructure planning

4. Emerging skill needs for both enterprise and advisory

- Digital literacy
- Technology operation
- Data management
- Data monitoring, analysis and interpretation
- Digital communication
- Business disruption
- Cyber security

Workforce management and planning strategies

Strategies for attracting, retaining, and developing industry employees

In light of an ageing workforce and widespread labour shortages, training the next generation of skilled workers is more critical than ever for sustaining and growing operations across Agriculture and Production Horticulture. Multiple approaches have been implemented to attract new employees to industry careers, and have been designed in consideration for:

- addressing widely held community misconceptions about poor working conditions and pay in the Agriculture and Production Horticulture Industries (including changes to the Horticulture Award that mean farm workers are now guaranteed a minimum hourly rate⁷⁰)
- showcasing jobs and careers with a modern image
- brokering employment experiences for young people to enter the Agriculture and Production Horticulture industries
- making general information available on the location, timing and labour requirements for Agriculture and Production Horticulture roles
- providing targeted industry entry pathways (training, experience, mentoring and ongoing positions/education)⁷¹.

With the development of Industry Clusters as part of the Australian Skills system, industry stakeholders are beginning to formulate attraction methods based on workplace-based experience and training opportunities for transferable skills that may be applied across multiple industries. While the Agriculture and Production Horticulture industries wish to attract new entrants into specific occupations, there have been difficulties attracting initial interest, which may be overcome through strategies such as showcasing industry careers during public events and developing resources that 'speak' to young people. Various initiatives have been developed in agriculture and horticulture, including through NELLEN workforce development projects⁷², and as described in the case study below.

⁷⁰ ABC News (2022); *Fruit and veg pickers' minimum wage arrives this month and then we'll see the true cost of food*; <https://www.abc.net.au/news/rural/2022-04-08/fruit-and-veg-pickers-minimum-wage-arrives-this-month-/100975464>; viewed 08/04/2022.

⁷¹ J. Azarias, R. Nettle & J. Williams (2020); *National Agricultural Workforce Strategy: Learning to excel*; National Agricultural Labour Advisory Committee, Canberra, December; pp.165-169

⁷² Nellen (2022); Workforce Development; <https://www.nellen.org.au/projects/workforce-development-project/>; viewed 31/08/2022.

Case study: Brotherhood of St. Laurence addressing youth unemployment with promotion of agriculture careers

Youth-led videos to showcase dairy farming careers

Youth-led videos to showcase dairy farming careers have been developed through the Brotherhood of St. Laurence's National Youth Employment Body. To address higher rates of youth unemployment and underemployment in the Barwon South-West region of Victoria, a Community Investment Committee (CIC) was established in 2021 to bring together stakeholders from youth services, industry, employers, and education. One of the CIC's guiding principles is youth participation, specifically to highlight young people's capabilities by bringing their voices into the design and delivery of projects.

Many of those involved in the CIC have strong links to the area's agriculture sector and identified challenges in attracting young people to the sector. Through engaging with young people involved in the CIC and young people working in the dairy sector, a career inspiration video was produced: *Pathways into Agriculture* (<https://vimeo.com/708926700>). The project was led by Sidney, a trainee at Gunditjmara Aboriginal Cooperative and former Transition to Work participant. Sidney's team participated in an eight-week program and were given autonomy over the planning and content of the video, with support from Colleen Hughson of First Ladies Production. The resulting video features Coorimungle Farm workers Rebecca and Chloe, who share their skills and employment journey and insights on the positive aspects of working on a dairy farm.

A cross-sectoral partnership for strengthening agricultural pathways

In September 2021, the Brotherhood of St Laurence convened a system design workshop with Skills Impact, employers, industry, government, community and training stakeholders from agriculture (including included Brophy Family and Youth Services, South West TAFE, Dairy Australia, and Food and Fibre Great South Coast). The aim of the workshop was to identify ways to encourage young people to seek employment in the industry, especially in the context of increasing rates of youth unemployment and longstanding agricultural labour shortages being exacerbated by COVID-19. In the workshop and follow-up consultations, an opportunity was identified to trial a new training approach for encouraging young people into agriculture occupations in the Barwon South West region. Alongside youth underemployment, this *AgFutures* project aims to address issues around declining uptake and completion of entry-level agricultural programs among new workforce entrants.

In March 2022, Skills Impact and the Brotherhood of St Laurence co-ran a workshop with employers and key stakeholders in Warrnambool, Victoria, to understand employers' skills needs, especially for entry level positions on farms. Following these consultations, the *AgFutures* project has designed a short-form qualification that teaches young people the skills needed to enter the dairy industry while meeting the skills needs of employers.

As part of a high-level workforce planning strategy, the Queensland Farmers' Federation (QFF) and Rural Jobs & Skills Alliance (RJSA) have mapped their attraction and retention pathways both to ensure a pipeline of skilled workers and to develop the capabilities of those already in employment. This points to work that must be undertaken through the media, educational partnerships that must be developed, information campaigns that must be run, and different cohorts that must be targeted:

Strategy	Activity/Target Cohort
Attract	Branding
	Story telling
	Social media
	School excursions
	Industry partnerships
	Teacher training and education
	Parent/guardian education
Taste	School programs that inspire
	Non-specific STEM programs that include or combine agribusiness, food and fibre topics
Engage	Work experience
	Gap year
	Induction and work ready programs
	Career pathways
	Employment programs
Skill	VET qualifications, including traineeships and apprenticeships
	Skill sets and introduction courses
	Work placements
	Tertiary
Upskill	Skill sets
	Extension
	Short courses
	Industry training
	Mentoring
Reskill	Skill sets

Skills reform

To ensure that training is offered where and when it is needed, the *National Agricultural Workforce Strategy* (NAWS) highlights that it should be demand-driven and designed with extensive industry consultation. Industries must contribute by better articulating ‘the demand for education and training and do so with greater clarity.’ As the nature of work in the primary industries changes, with new technologies and roles being introduced, ‘industry leadership is required to guide education and training development in emerging and new areas that span sectors and states such as digital agriculture and ethical supply chain auditing’.

The NAWS warns, however, that:

‘It is the Committee's view that the current mechanisms by which the sector can demonstrate leadership in education and training are insufficient to influence education and training provision at the depth, scale and rate required to meet future agricultural workforce needs. In addition, there is not enough incentive for education and training providers to respond to industry needs in a timely and meaningful way. Further, decades of underinvestment by the sector itself and government to leverage education and training outcomes for the sector have undermined performance.’

J. Azarias, R. Nettle & J. Williams (2020); National Agricultural Workforce Strategy: Learning to excel; National Agricultural Labour Advisory Committee; Canberra, December; p.133

Efforts by the Australian Government, industry and the VET system have already started addressing these

concerns⁷³. The Australian Government response to the NAWS outlines a roadmap with linked themes for government and industry action:

Figure 2: Australian Government roadmap directions



Source: DAWE (2021); *Building the Agricultural Workforce of the Future*; Department of Agriculture, Water and the Environment, Canberra.

Through the Heads of Agreement for Skills Reform, all governments have committed to VET system reform to improve quality and relevance as part of a series of high-level reform priorities within a new Industry Cluster system. These include:

⁷³ Department of Agriculture, Water and the Environment (2021); Australian Government roadmap to attract, retain, upskill and modernise the agricultural workforce; p.6

Table 3: Proposed VET Reform Industry Cluster functions

Function	Key objective	Related activities
Workforce planning	To understand and address workforce challenges	<ul style="list-style-type: none"> • Examining current, emerging and future workforce challenges • Identifying strategies to address workforce and skills needs • Prioritising a forward plan for training product development • Drawing on and informing labour market analysis and other evidence developed by the National Skills Commission
Training product development	To develop training products that meet evolving industry needs	<ul style="list-style-type: none"> • Developing training products that comply with the Training Package Organising Framework and Standards for VET Accredited Courses • Testing new approaches to skills and workforce development
Implementation, promotion and monitoring	To drive improvements in the development and delivery of training and assessment	<ul style="list-style-type: none"> • Building engagement in the national training system • Collaborating with employers and education and training providers • Identifying and promoting relevant career pathways, working with the National Careers Institute • Supporting end-to-end development and delivery of training
Industry stewardship	To provide a strong, strategic industry voice	<ul style="list-style-type: none"> • Providing intelligence on industry workforce issues • Establishing feedback loops across the training system • Providing strategic advice to Ministers on workforce and skills needs, policies and standards, and system improvements • Working with other Industry Clusters

Source: Transition Advisory Group (2021); *Final Advice – New Industry Engagement Arrangements*; p.6

The National Farmers’ Federation (NFF)⁷⁴ have welcomed skills reform through the proposed Industry Cluster Model for Australia’s vocational education and training (VET) system. The NFF state that reform proposals are good news for agriculture’s future workforce needs, and for working towards doubling the number of tertiary and vocational agriculture graduates by 2030, as per their *2030 Roadmap*. NFF CEO Tony Mahar has said:

‘As an industry and with Government support, there’s much more work to do to create clear pathways to attract and develop workers and nurture the skills agriculture needs for the future. [...] This is a unique opportunity for Industry Clusters to affirm and expand industry leadership in VET, while ensuring all employers have greater engagement in, and access to, the training system. The training needs of Australian farms and the service sector continue to evolve, and we need a system that can evolve with it. These reforms give industry a strong say in the direction skills development and training takes and is a big step forward. [...] We have unique and complex challenges training

⁷⁴ National Farmers Federation (2022); *Training changes support NFF’s goal to double agriculture vocational graduates by 2030*; <https://nff.org.au/media-release/training-changes-support-nffs-goal-to-double-agriculture-vocational-graduates-by-2030>; viewed 18/05/2022.

people in regional and remote areas, one of those being small numbers of course placements needed to make a big impact on agricultural industries. The metrics for large cohorts of city-based placements don't always work in the bush and we need to ensure decision makers take these factors into consideration. [...] Now is the time to invest heavily in our food and fibre industries and ensure that we have the skilled people available to work today, but also on the farms and in food businesses of tomorrow.'

Tony Mahar

<https://nff.org.au/media-release/training-changes-support-nffs-goal-to-double-agriculture-vocational-graduates-by-2030/>

Please see the *Agribusiness, Food and Fibre Industries Skills Report* for additional information on government support for attracting workers to the Agriculture and Production Horticulture industries.

Training Summary

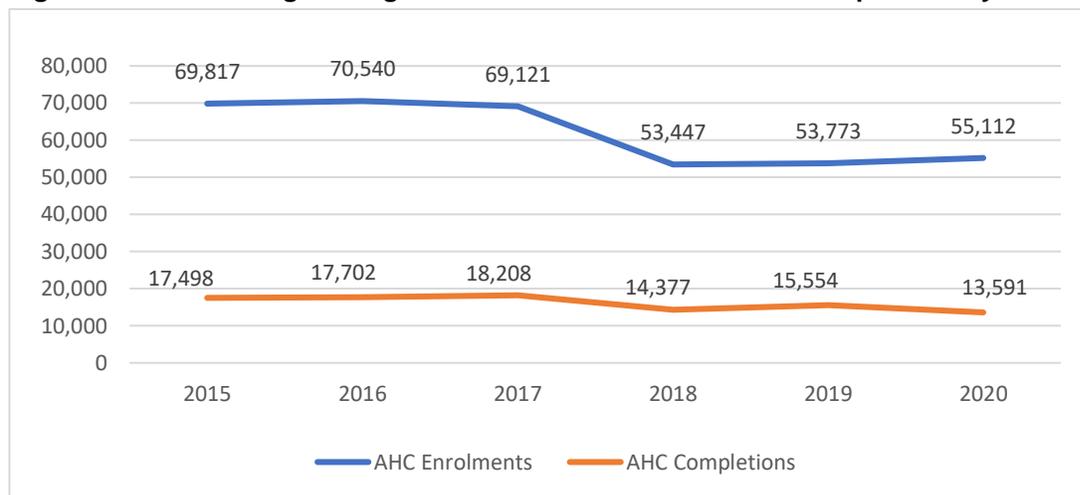
VET participation

AHC Qualifications

In 2020, there were 55,112 enrolments in *AHC Training Package* qualifications.

There were 13,591 qualification completions in 2020.

Figure 3: AHC Training Package Qualification Enrolments and Completions by Year



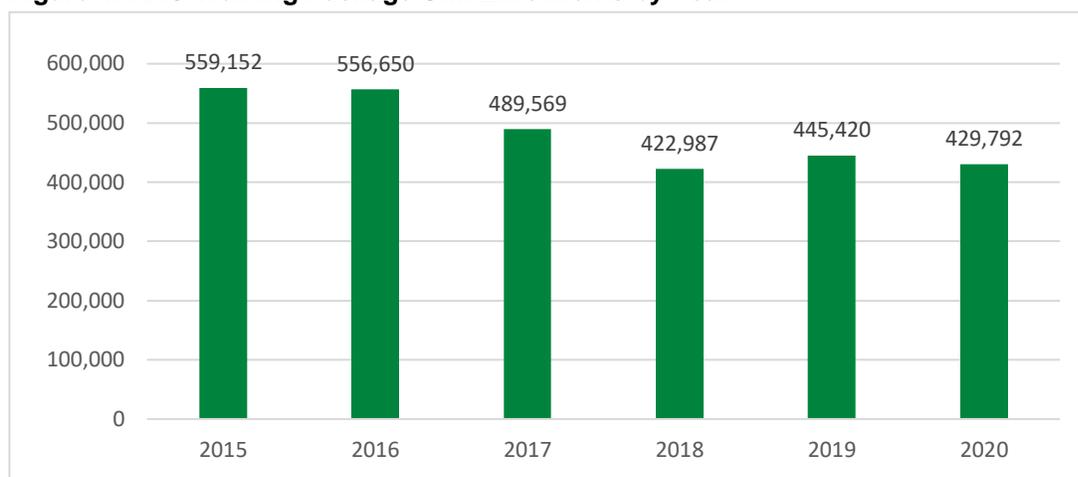
Source: NCVET VOCSTATS, TVA program enrolments 2015-2020

The greatest number of qualification enrolments in 2020 were in Queensland (16,377), followed by New South Wales (14,959) and Victoria (12,211).

AHC Units of Competency

In 2020, there were 429,792 enrolments in AHC units of competency (hereafter 'units'). This includes enrolments through qualifications (in any training package), apprenticeships and non-apprenticeships, skill sets and micro-credentials.

Figure 4: AHC Training Package Unit Enrolments by Year



Source: NCVER VOCSTATS, TVA subject enrolments 2015-2020

AHC Training Package units are developed with multiple industries and delivered by the training providers servicing those multiple industries, because of their capacity to be contextualised. This transferability ensures the training system supports individuals to move easily between related occupations and sectors. Such is the relevance and portability of AHC Training Package products, there are 752 instances of AHC units being imported into non-AHC Training Package qualifications.

The AHC Training Package is one of the most extensive and diverse in the Australian VET system, and is currently being delivered by 1,041 RTOs⁷⁵. Two Industry Reference Committees (IRCs) are collaboratively overseeing reviews and development of the training package, including through a 'Unit Sector Approach' (described in previous Skills Forecasts), an innovative strategy for reviewing the entire training package more efficiently. In 2022, year three of this four-year project saw a broad review of units leading to unit code changes, which in some cases were reflective of not-equivalent content. There are still 45 AHC qualifications and 20 skill sets that would be subject to major changes, including code change, because of these recently reviewed units being Not Equivalent (minor changes to qualifications were actioned as part of AHC V9). It is proposed the work required to make these updates is done as part of a small project in 2023.

Employers' use and views of nationally recognised training

Please see the *Agribusiness, Food and Fibre Industries Skills Report* for additional information on learners' motivations for undertaking training, and employers' tendency to adopt mixed models of training, comprising formal VET, extension, and informal workplace-based capabilities development.

Employers' choice of training provider is influenced by such variables as local availability of training services, training provider reputation, time constraints, capital (associated with business size and sector) and seasonality. There are also barriers to engaging in nationally recognised training, including:

- difficulties establishing and clarifying the value proposition of VET
- preferences for engaging in flexible and shorter-form training that addresses immediate and

⁷⁵ National Training Register (2022); RTOs approved to deliver this training package; <https://training.gov.au/Search?SearchType=Rto&searchTgaSubmit=Submit&scopeNationalCode=AHC&includeImplicitScope=true®istrationStatus=0%2C1%2C2%2C3>; viewed 21/07/2022.

practical workplace needs, and

- RTOs' challenges with delivering in thin markets (where supply and demand is imbalanced, often due to the practical challenges of operating in regional areas).

Rural, Regional & Remote Summary

Please see the *Agribusiness, Food and Fibre Industries Skills Report* for additional information on the many and intersecting challenges of stimulating industry growth and communities in rural, regional and remote areas. It is described how many Agriculture and Production Horticulture enterprises are located in regional locations where access to skilled workers, and resources for inexperienced workers' development, is limited. A lack of infrastructure, housing, public transport, health services, broadband and mobile connectivity, and access to education and skills training services makes moving to some locations an unattractive proposition, and businesses are forced to incentivise potential employees by offering higher wages, which can often be challenging financially⁷⁶.

Implementing the recommendations of the *National Regional, Rural and Remote Tertiary Education Strategy* ('the Napthine Review')⁷⁷, as has been asked of Australia's first Regional Education Commissioner, will complement the VET reform agenda as well as efforts by regional industries to improve productivity and profitability. The Transition Advisory Group⁷⁸ are clear that businesses in regional areas must be adequately represented in the reformed VET system so that appropriate training is delivered where and when it is needed. This requires improving employer engagement with the national training system, creating collaborative relationships between employers and training providers, and working towards longer-term workforce development objectives.

Aboriginal & Torres Strait Islander Peoples Summary

Aboriginal and Torres Strait Islander cultures possess skills and knowledge that are crucial to land and sea management activities, including conservation and cultural heritage roles. Some of these skills are described in nationally endorsed qualifications, skill sets and units that are used by registered training organisations (RTOs) to equip learners for various jobs in the AHC industries. Please see the *Agribusiness, Food and Fibre Industries Skills Report* for more information.

With extensive and increasing **Aboriginal and Torres Strait Islander Custodianship** of land across Australia, efforts to harness and improve the productivity of agricultural activities are impacting positively on social, economic and cultural outcomes for Indigenous communities⁷⁹.

Various Indigenous-led operations, businesses and training providers are operating in Agriculture and Production Horticulture, especially the pastoralism sector, to develop peoples' capabilities and nurture employment opportunities, for example:

- Yawuru traditional owners have taken over pastoral operations at Roebuck Plains Station (30km from Broome in the West Kimberley). As part of the transfer of management of Roebuck Plains, native title holders Nyamba Buru Yawuru (NBY) will purchase 15,000 head of cattle from the Indigenous Land and Sea Corporation⁸⁰. NBY intend to create many employment opportunities for

⁷⁶ Infrastructure Australia (2022); *Regional Strengths and Infrastructure Gaps Overview*

⁷⁷ Commonwealth of Australia (2019); *National Regional, Rural and Remote Tertiary Education Strategy*.

⁷⁸ Transition Advisory Group (2021); *Final Advice – New Industry Engagement Arrangements*; Australian Government Department of Education, Skills and Employment; p.2.

⁷⁹ KPMG and National Farmers' Federation (2018); *Talking 2030*; p.66

⁸⁰ ABC News (2022); *Yawuru traditional owners take the reins at outback cattle station in WA's Kimberley region*; <https://www.abc.net.au/news/rural/2022-02-01/roebuck-plains-station-handover-to-yawuru-traditional-owners/100793486>; viewed 01/02/2022.

Indigenous people, including with traineeship programs⁸¹.

- The Aboriginal Pastoral Academy program was started by the Yawuru native title holders in Broome, WA, to train school leavers to work on cattle stations. The program has now been extended through a formal collaboration between the Kimberley Pilbara Cattlemen's Association, Nyamba Buru Yawuru, and the WA government, with hopes it will create more job pathways for young people and address workforce shortages. This program is intended to complement the Warrmijala Murrugulayi Rise up to Work program to help improve links between school-based programs, pre-employment, and vocational training (with additional support through refresher courses, mentoring and workplace placements)⁸².
- The Real Jobs program, an initiative by the Northern Territory Cattleman's Association, is designed to involve young Indigenous people in the pastoral industry. The program delivers skills in fencing, motorbike riding, horsemanship, and cattle work⁸³, and guarantees participants a full-time job in a stock camp on a Northern Territory cattle station at the end of their two-week course⁸⁴.
- Aboriginal leaders and pastoralists in Coober Pedy, SA, are collaborating to provide training and employment opportunities for Indigenous people, while helping to address a skills shortage in the pastoral industry. Saltbush Ag have taken up a sub-lease on Mabel Creek Station and have approved training for more Indigenous people in sheep and cattle skills⁸⁵.
- First Nations farmers are to participate in a pilot scheme in Victoria to improve agricultural skills and develop opportunities for creating businesses to sell products such as honey. Trainees will learn regenerative practices at Outback Academy Australia, an Indigenous-led not-for-profit that focuses on inclusive and traditional approaches to agriculture⁸⁶.

While recognising the successes of these initiatives, it is important also to acknowledge that Aboriginal and Torres Strait Islander peoples' representation in the workforce is still low. In addition to environmental targets, the *Australian Beef Sustainability Framework*⁸⁷ sets social and economic objectives, including to increase Indigenous participation. The *Annual Update 2021*, however, reports a 'setback' from survey results that show a decline from 5% in 2019 to 2.8% in 2020. Stakeholders have identified that training and support opportunities and funding are critical for attracting and retaining people in industry careers⁸⁸.

As per the *NFF's 2030 Roadmap*, work continues with Indigenous leaders to grow opportunities for Aboriginal and Torres Strait Islander peoples in agriculture, including to reduce disadvantage, attract new labour and skills, and have better representation of Indigenous agriculture and leadership.

⁸¹ ABC News (2020); *From boarding school to station school: Meet the next-generation cowboys of the Kimberley*; <https://www.abc.net.au/news/rural/2020-11-29/kimberley-cowboys-finding-valuable-work-on-station/12923958>; viewed 31/08/2022.

⁸² ABC News (2022); *Kimberley pastoral partnership boosts job prospects for Indigenous youth, fills vacancies*; <https://www.abc.net.au/news/2022-04-06/kimberley-pastoral-partnership-creates-indigenous-youth-jobs/100968362>; viewed 31/08/2022.

⁸³ ABC News (2021); *Aspiring Indigenous cattlemen and women hone their skills in the Red Centre*; <https://www.abc.net.au/news/rural/2021-02-17/indigenous-stock-handlers-learn-their-craft-in-the-red-centre/13159542>; viewed 31/08/2022.

⁸⁴ ABC News (2022); *Aspiring cattlemen and women learn the skills of the pastoral industry*; <https://www.abc.net.au/news/2022-02-25/aspiring-cattlemen-and-women-getting-back-to-their-roots/100858594>; viewed 31/08/2022.

⁸⁵ ABC News (2021); *Saltbush Ag to provide pastoral training and employment at Coober Pedy's Mabel Creek Station*; <https://www.abc.net.au/news/2021-05-27/mabel-creek-outback-pastoral-training-indigenous/100170760>; viewed 31/08/2022.

⁸⁶ The Guardian (2022); *First Nations farmers to get traditional lessons of the land in Victorian pilot scheme*; <https://www.theguardian.com/australia-news/2022/jun/02/first-nations-farmers-to-get-traditional-lessons-of-the-land-in-victorian-pilot-scheme>; viewed 31/08/2022.

⁸⁷ RMAC (2021); *The Australian Beef Sustainability Framework: Annual Update 2021*; https://www.sustainableaustralianbeef.com.au/globalassets/beef-sustainability/documents/bh02_annual-update_v18.pdf

⁸⁸ ABC News (2021); *Indigenous workforce in beef industry nearly halves over short period*; <https://www.abc.net.au/news/rural/2021-07-07/naidoc-indigenous-employment-beef-cattle-pastoral-grazing/100270438>; viewed 31/08/2022.