



Agriculture, Horticulture, Conservation and Land Management



The skills of the agriculture, horticulture, conservation and land management industry are key to preserving and managing Australia's national and state parks, public gardens, sporting grounds, farms and water bodies.

Due to agricultural production, Australia is one of the most food secure countries in the world. The skills of the landscaping and land management sectors have also increased in popularity with people spending more time at home and outdoors.

The skills across all sectors of the industry are constantly evolving with the introduction of new technologies and science. Robotics, satellites, sensors and other digital technologies are driving innovations, to increase productivity, safety and quality of products and services.

Employs over
470,000 people

More than 178,000
businesses

Contributes over
\$37 billion to Gross
Domestic Product

Revenue of over \$150
billion

Source: IBISWorld Industry Wizard, 2021

The gross value of Australia's agricultural production is forecast to reach a record \$73.0 billion in 2021-22. If accomplished, this will be the first time that agricultural gross value has surpassed \$70 billion.

The value of agricultural exports is forecast to hit record highs in 2021-22, increasing by 12% to \$54.7 billion.

Source: ABARES, 2021, *Agricultural Commodities: September quarter 2021*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

The industry experienced significant disruption over the last year as they continued to deal with the impacts of COVID-19, drought, bushfires, and trade issues on workforce development. Due to international and state borders being closed, many businesses experienced labour and skills shortages, at a time when domestic food supplies, nursery products and landscaping services encountered unprecedented levels of demand.

Australian farmers and horticulturalists showed their resilience with many businesses seeking alternative markets for their products. For example, barley growers reported increased market activity in the Middle East and Asia, and cotton growers moved into markets such as Indonesia, Thailand, Vietnam and Bangladesh. This diversification has enabled some sectors' relative recovery and reduced the risk of being over-reliant on any one market.

In December 2020 the National Agricultural Labour Advisory Committee delivered its National Agricultural Workforce Strategy. The strategy confirms that the industry is a complex and sophisticated system. Its performance relies heavily on the skills of its people. The Committee highlighted five key principles to meet future workforce needs:

- Education and training strategies should be industry-led, demand-driven and collaborative in vision with education providers.
- The AgriFood sector should strengthen the linkages between education and training and occupations across their sector.

- The education and training sectors should modernise the span of educational offerings and delivery modes in response to clear industry signals.
- Education and training should be underpinned by sufficient investment, reflective of a progressive and growing sector of the Australian economy.
- Stakeholders should share a commitment to demonstrate impact from investment and accountability for industry-defined outcomes in education and training.

The national skills standards and qualifications for the agriculture, horticulture, conservation and land management industry are overseen by the Agriculture and Production Horticulture Industry Reference Committee (IRC) and the Amenity Horticulture, Landscaping, Conservation and Land Management IRC.

Skills Forecast

Both IRCs have been overseeing a major review of the AHC Agriculture, Horticulture and Conservation and Land Management Training Package through a 'Unit Sector Approach', which commenced in 2019. Work this year focused on the sectors of landscaping, animal reproduction, dairy and milk harvesting, parks and gardens, land rehabilitation (mined land), crops, pastures and seed. The project work has focused on updating the national skills standards to meet current skills requirements, especially where technologies are quickly evolving. It has also focused on streamlining the skills standards, to remove duplication across the training package, enhance opportunities for identifying cross-sector units, and better support graduates' capabilities in moving between occupations and industries. The final phase of this project work will commence in 2021-22 and will look at the skills standards related to composting, organic production, permaculture, livestock, Indigenous, community and common work-related skills. An additional project for 2021-22 will look at the skills standards for the acquisition, management and trading of water.

Over the past year there has been an upsurge in demand for nursery and landscaping products and services. COVID-19 has impacted peoples' use of domestic space, notably gardens. Google searches for 'how to grow vegetables' hit an all-time high in April 2020. Nurseries and garden centres have been inundated with new and experienced customers seeking to develop and upgrade their gardens and veggie patches. With growing evidence that new customers plan to maintain and extend their home and community gardening endeavours, the demand for complementary skilled landscaping and nursery workers is likely to increase.

A challenge for the industry this year has been around skill shortages, due to the closure of state, territory and international borders. There has been an urgent need to replace backpacker, seasonal and visa workforces in entry-level roles, while protecting the Australian agricultural industries from the risks associated with the rapid deployment of new workers. It has been very difficult to retain or replace workers with experience in mentoring and leadership, especially as COVID-19 has accelerated the rate of people exiting industries (those with ageing workforces have been particularly affected), leaving fewer workers who would normally be relied upon to assist in the development of the next generation.

The agricultural workforce was already facing a labour and skills shortfall due to the challenges associated with attracting workers to the industry. These challenges are related to work being based in regional, rural and remote areas, barriers to labour mobility, and the availability of effective workforce training. There are also challenges in attracting new entrants based on the misunderstanding about what a career in the agriculture and horticulture industry offers.

“The technological innovation that is taking place within the sector and the new careers that are possible are not being communicated to students. In particular, urban students are unlikely to realise that the majority of roles in the agriculture sector occur after the farm gate.”

YouthInsight (2017); Developing student interest in the agriculture sector; Western Australia

Projects for 2020-21

The following projects have been approved by the Australian Industry and Skills Committee (AISC) for 2020-21:

Review of Unit Sectors

Given the size and complexity of the AHC Agriculture, Horticulture and Conservation and Land Management Training Package, this work involves a continuation of the unit sector approach for Year 3 of the strategy, as outlined in the current 2019 – 2022 Skills Forecast. It will consist of four sub-projects across the following areas and sectors:

- Community and common work-related skills
- Composting, organic production and permaculture
- Livestock
- Indigenous

“The organic farming industry is projected to grow at an annual rate of 15% over the next five years.”

IBISWorld, 2020

Water Allocation & Entitlement Skills

Access to water resources is vital to Australian farmers and it is equally vital that farming communities understand the water market. Water literacy in education, including VET, is one recommendation of the 'Keelty Report' inquiry into Murray-Darling Basin water resource management? The proposal for this project is to develop up to five units and one skill set to capture the skills needed for the acquisition, management and trading of water within the agricultural, pastoral and production horticultural sectors.

Project Work Between 2020-21

Outlined over the following pages is a summary of the projects Skills Impact managed between July 2020 and June 2021.

The Agriculture and Production Horticulture Industry Reference Committee (IRC) and the Amenity Horticulture, Landscaping, Conservation and Land Management IRC oversaw the project development, as part of their responsibility to support engagement with their industry and to ensure the projects meet stakeholder needs.

The skills standards and qualifications updated as part of the following projects are expected to be endorsed by the AISC and State and Territory Ministers in early 2022.

Animal Reproduction Project

For generations farmers have been managing the reproduction of livestock and poultry to support the welfare of animals and optimise return on effort, support the welfare of animals and increase sustainability. Identifying breeding objectives, genetic influences, animal soundness and breeding health can help improve production of products like meat, dairy, eggs and wool. Increasing access to technologies such as ultrasound equipment, sensors and trackers is making it possible to better monitor animals and build on these practices.

Thanks to the input of everyone involved in this project, the technical and digital skills required to take advantage of the many benefits of these technologies have been captured in updated skills standards.

Qualifications, a skill set and units of competency have been revised to reflect terminology relating to different livestock species; to incorporate the key skills for maintaining health and safety in the workplace, such as the use of

personal protective equipment and hygiene procedures; and to include current biosecurity, environmental and animal welfare legislation and regulations. The frequency and volume of evidence that needs to be collected by an assessor to determine competence has been added to units, including accuracy percentages in some units. The Diploma of Pork Production and four units are proposed for deletion as they have had low enrolments and the skills they describe are in low demand.

Key Outcomes

- The Certificates III in Pork Production and Poultry Production were revised, with updates made to the description, packaging rules, and titles of core and elective units. The Certificate III in Agriculture (Dairy Production) was also reviewed as part of the Dairy and Milk Harvesting Project and contains some units that were reviewed as part of this project.
- The Diploma of Pork Production and four units are proposed for deletion as they have had low enrolments and the skills they describe are not required by industry.
- The Pork Industry Stockperson Skill Set was updated to include a biosecurity unit of competency, as requested by representatives of the pork production industry sector.
- The Poultry Industry Beak Tipping Skill Set was discussed as having low enrolments and will be considered in a future project, as the IRC indicated further investigation may be required.
- Twenty units were revised to clarify terminology, performance criteria, performance evidence

and assessment conditions.

Animal welfare practices and the importance of consulting with a veterinarian have also been outlined for tasks within specific units.

Crops, Pastures & Seeds Project

The success of Australia's broadacre cropping and animal production industry is underpinned by skills to produce crops and pastures from high quality seed. With increasing global demand for food and fibre, and challenges brought about by changing environmental conditions, the broadacre farming and seed production sectors are turning to the latest technology and science, hoping to create crops that are drought resistant, higher yielding, and more nutritious. As a result, the skills for working in the sector are changing, with mapping technology, RADAR and stereoscopic sensors, LIDAR, satellite positioning and satellite imagery being used to record the volume, mass and moisture of crops, and to assess crop performance and soil characteristics. These skills are essential for supporting biosecurity and supplying farmers with seed that is free from disease, organisms and pests.

As a result of this project and consultation with industry throughout Australia, units across the seeds, crops and pastures sectors were updated and developed so that they accurately capture current industry practices and technologies. Concepts surrounding precision agriculture were also embedded in units relating to broadacre cropping. Feedback from industry, during the consultation phases of the project, indicated that the current units on the National Training Register did not accurately reflect current job roles. It is understood this has been a factor

limiting delivery demand for these units. To further enhance the delivery of these units, it is also proposed that a seeds specialisation or stream is added to the Certificates III and IV in Agriculture, which are approved for review in 2021-22. Therefore, for the short term and to avoid any units being orphaned, the indicative seven AQF level 3 and three level 4 seed units (AHCSTD and AHCSP0) will be added as elective units into the respective qualifications (Certificate III in Agriculture and Certificate IV in Agriculture). New units have been developed where necessary to reflect up-to-date industry practice and include an array of the new technology being implemented in the field, from satellite positioning guidance of farming equipment to laser tech designed to detect pests and disease.

Key Outcomes

- Thirty-three units revised or developed to reflect current industry practices, terminology and equipment.
- The five qualifications detailed below have been proposed for deletion as they are no longer required by industry. The request to add a seeds specialisation or stream to the Certificate III in Agriculture will be proposed as part of a future project to address the need for these skills to be retained and available within a qualification.
 - AHC32116 Certificate III in Commercial Seed Processing
 - AHC33416 Certificate III in Seed Production
 - AHC33516 Certificate III in Seed Testing
 - AHC41416 Certificate IV in Seed Production
 - AHC41516 Certificate IV in Seed Testing.

- Fourteen units are proposed for deletion because they include skills that are no longer required by industry or they are duplicated by another unit.
- Fourteen units that have similar learning outcomes have been merged. Examples of merged units include:
 - creation of a unit for processing planting seed, which merges the skills captured by five previous units
 - creation of a unit for performing advanced tests on seeds, which merges the skills captured by seven existing units
 - creation of a unit for performing quality tests on seeds, which merged AHCSDT303 Perform a fluorescence test on seeds and AHCSDT304 Perform a seed purity analysis.

Dairy & Milk Harvesting Project

Australia's dairy and milk industry directly employed around 46,200 people and generated \$4.4 billion in farm gate value in 2018-19³. Farms range in size from small niche herds of goats, camel, buffalo and sheep, through to large dairy businesses with more than 3,000 cattle. Technology in this industry is developing rapidly. Innovations in the industry have seen milking methods evolve from manual,

to herringbone and rotary sheds, to the more recent introduction of robotic technology and automatic milking systems. As a result, the range of skills used across the industry is expanding. At the same time, traditional work practices remain valuable in various farm settings. Foundational skills, such as those to support biosecurity and animal welfare, are integral to all methods. This project looked at the skills and knowledge required to operate the vast array of technologies, across dairy harvesting operations of various sizes and contexts

Consultation has taken place throughout this project to revise the current qualification and skills standards for dairy and milk harvesting, so that they better reflect modern terminology, equipment and job roles within the sector. The Certificate III in Agriculture (Dairy Production) has been renamed to the Certificate III in Dairy Production. Existing units were revised and some proposed for deletion, to reflect current skills needs. One skill set and one unit were developed to capture the skills and knowledge required to maintain complicated automated mass milking machines.



³ Department of Agriculture, Water and the Environment, 2021, 'Dairy in Australia', viewed August 2021 <<https://www.agriculture.gov.au/ag-farm-food/meat-wool-dairy/dairy>>

Key Outcomes

- The Certificate III in Agriculture (Dairy Production) was revised to better reflect current industry needs, including the proposal to rename the qualification to Certificate III in Dairy Production.
- A skill set was developed to support the skills for maintaining on-site equipment.
- Six existing units were updated to include modern industry practices, including troubleshooting automated milking machines to reduce dairy's reliance on external technical support to keep the equipment running. The language within the units has also been updated so that it is inclusive of a wider range of milking animals, including goats, camels, buffalo and other animals.
- A unit that describes the skills for carrying out a routine service of milking equipment was developed.
- Seven units are proposed for deletion due to no/low enrolments and no longer required by industry.

The Australian dairy industry is dedicated to the skills development of its future workforce. A new Dairy Passport has been launched by Dairy Australia and supported by the Victorian Government, under the Agriculture Workforce Plan.

Landscaping Project

Landscapers draw on a range of expertise in horticulture, plant care and construction materials to design, construct and maintain the green spaces in private and community spaces. With urban city blocks getting smaller and many backyards acting as an extension of the living room, landscapers are working to deliver the most out of every space. Special considerations need to be made for environment and site conditions to design, construct and maintain gardens, so they are safe, comfortable and sustainable. Well designed and

constructed gardens offer both social and economic value, improving the liveability of our communities.

Thanks to the input of those involved in this project, the skills standards for work in landscaping have been updated to reflect current safe work practices and standards, industry regulations, the latest in technology, and up-to-date knowledge of horticulture and ecology.

Qualifications and units have been revised to more accurately describe job functions and the range of tasks that landscapers are required to perform, as well as to incorporate the latest technologies, equipment, regulations and consumer trends. Industry considered the issue of low enrolments in qualifications, recognising that they had not been reviewed recently and had been designed with a focus on horticulture. Feedback indicated that the qualifications are required by industry to meet their training needs, but that they could be made more relevant to industry and support clearer career pathways by broadening their focus to encompass the full scope of skills required. The updated qualifications and units reflect the increased consumer demand for a wider range of services and products and recognise the distinct skills required for tasks involved in the construction and design of gardens.

Key Outcomes

- Five national qualifications and two state accredited qualifications were considered, resulting in six draft qualifications. They have been reviewed to clarify their focus and indicate clear career pathways. The updated qualifications include units relevant to addressing building codes and standards, building principles, design, project management, health and safety in the workplace and licensing arrangements.
- Four skill sets are proposed for deletion due to low enrolments and no longer being required by industry.
- One skill set has been developed to support landscape design within

Australia's burgeoning therapeutic horticulture sector. Allied health professionals who develop therapeutic horticulture programs are covered under the HLT Health Industry Training Package. This skill set captures the skills in design required to plan garden spaces in schools and aged care facilities to carry out these programs.

- Twenty-four units have been reviewed to incorporate changes in technology and workplace practices and techniques, and to reflect current terminology. Where practicable, units were revised for use across multiple industry sectors (landscape, parks and gardens, horticulture, etc.) enabling individuals to move more easily between related occupations within the industry.
- Ten units have been developed to meet industry skill needs. They include: six design units that were developed to meet national industry skill requirements relevant to landscape design, producing landscape drawing and using CAD software; two units for landscaping construction that were developed to meet licensing requirements in certain states, so that graduates across the country can perform landscaping construction work; one unit for implementing an outdoor tiling project that was developed to meet increased customer demand in this area; and one unit to address the need for landscaping design skills standards for therapeutic horticulture.

Parks & Gardens Project

A skilled workforce of grounds keepers and gardeners are responsible for managing and maintaining Australia's many parks and gardens. It is important that these spaces are cared for, so that the public can continue to access safe and pleasant green spaces for recreation and leisure activities, as this can support mental health and wellbeing. Many parks and gardens are also home to native and unique plant species, animals and historic structures, which hold cultural and social importance. The



skills for this work are changing, as industry builds on its practices to promote biodiversity, adapt to climate change, and acknowledge the cultural significance of parks and gardens. Expertise in horticulture and an ability to work alongside other industry professionals are a necessity, with increased focus on skills for reusing resources, planting native species, and reducing herbicide and chemical use.

Industry have driven this project to review and update the national skills standards for caring for parks and gardens. Units of competency for working in parks and gardens have been revised to reflect current terminology, equipment, work practices (including sustainable use of materials), and workplace health and safety requirements. The Certificates II and III in Parks and Gardens have been updated to support strong pathways into the industry.

Key Outcomes

- The Certificates II and III in Parks and Gardens have been revised to support strong pathways into the industry, and to reflect the current job roles of the industry more accurately.
- The Certificate IV in Parks and Gardens and Diploma of Parks and Gardens are proposed for deletion. The associated high-level units within these qualifications have been reviewed and retained as they still hold great relevance to the tasks industry undertake. They

have been added to Diploma of Horticulture as electives, with the intention of reviewing how they are incorporated into the qualification when it is reviewed as part of another project in 2021-22.

- Nineteen units were revised to reflect current work practices and job roles and include references to waste disposal options such as recycling where applicable. The units for skills to address climate change and urban heat mitigation will be retained. These units are AHCPGD503 Manage parks and reserves and AHCPGD504 Develop and implement a streetscape management plan. Although both have low enrolment numbers compared to the national average, they are required to meet industry needs and there is expectation for renewed interest and an increase in enrolment numbers.
- The unit AHCPGD205 Prepare a grave site is proposed for deletion as it is not applicable to the parks and gardens industry and there are more suitable units within the SIF Funeral Services Training Package.

Skills for Land Rehabilitation (Mined Land) Project

Conserving and managing Australia's many unique ecosystems requires specialist skill and knowledge. While these skills are generally applicable to a range of geographically diverse natural locations, additional expertise is required to rehabilitate land after it has been used for mining. Working with topsoil that has been depleted of nutrients, managing the presence of chemicals and heavy metals, and considering structural hazards both above and below ground are all essential skills. Mine sites are now expected to have a land rehabilitation plan built into their plans for closure and with over 350 operating mines and mineral deposits across Australia, it is vital that the skills to restore mined land to a safe, stable environment are accessible.

Thanks to everyone involved in this project, the hands-on skills required to restore mined land have been captured in four skill sets and a 'rehabilitation of mined land' specialisation in the Certificate III in Conservation and Ecosystem Management. The subject matter experts who have helped support the development of draft skill standards for this work have considered how this work is increasingly undertaken by Indigenous rangers and other community members on Aboriginal lands, as well as the fact that it can require multiple inputs, including from environmental advisors, field workers carrying out conservation work, through to seed producers.

“The contents of each skill set and the specialisation added to the Certificate III in Conservation and Ecosystem Management are comprehensive of the skills required for somebody undertaking this work.

The specialisation will support a person developing a very rounded and multiskilled approach to their work. My role sits between an employee of a registered training provider and a contractor for rehabilitating contaminated sites. Working with Skills Impact from the inception of the project to the finished product, I feel confident in recommending the skill sets and qualification to those in my field of work.”

Matthew Pearson,
Central Queensland University.

Key Outcomes

- The option to specialise in the skills for the ‘Rehabilitation of Mined Land’ has been added to the Certificate III in Conservation and Ecosystem Management. Additional units have been added to the general elective bank of units in the qualification to support this specialisation, including work health and safety units.
- Four skill sets have been developed to address the following skills areas:
 - Providing administrative support on mined land rehabilitation projects
 - Carrying out work on-site on mined land rehabilitation projects
 - Operating machinery to assist with rehabilitation projects
 - Undertaking project coordination tasks in the rehabilitation of mined land.
- A unit describing the skills to develop work practices to accommodate cultural identity has been added to the Mined Land Rehabilitation Project Coordinator Skill Set, to reflect the skills in cultural sensitivity needed at a management level. A unit for managing enterprise staff requirements has also been added to the skill set.



Completed Projects

The following projects were endorsed by the Australian Industry and Skills Committee (AISC) and State and Territory Skills Ministers. The revised qualifications, skill sets and units of competency, that were developed as part of these projects, are published on the national training register (training.gov.au) and available for delivery by registered training organisations (RTOs).

Visit www.skillsimpact.com.au/completed-projects for further details.

Ag Biosecurity and Emergency Response Project

Skills standards for preventing and managing biosecurity issues and outbreaks have been identified and benchmarked to job roles and activities, to support industry address the biosecurity issues within Australia today and prevent those issues of tomorrow.

Agronomy Project

A Diploma of Applied Agronomy has been developed to address the technical expertise required to apply agronomy practices. A skill set in digital agronomy and two units in agricultural data and nutrition have also been developed, and six existing units were revised.

Conservation and Land Management Project

Conservation and Ecosystem Management is a large and complex sector responsible for caring for Australia's unique flora and fauna. This project reviewed and updated qualifications and units related to this work, across the sub-sectors of lands, parks and wildlife; natural area restoration; conservation earthworks and pest management.

Green Walls & Rooftop Gardens Project

Green infrastructure offers many benefits for city residents, helping to cool our cities, manage storm water and improve air quality. The unique skills required to design, construct and maintain green infrastructure have been captured in five units and three skill sets.

Horticulture & Nursery Project

The skills required to grow plants for human use are evolving as industry adopts new technologies, processes and operations. Qualifications have been reviewed, merged and updated to provide greater clarity and simplicity for industry regarding the qualifications available for their workforce and units have been updated to incorporate the digital and technical skills required across the supply chain, including in the sectors of production horticulture, nursery production and retail nursery.

Medicinal Crops Project

Unique skills are required to operate within the strict regulatory framework and security requirements of the medicinal crops sector. Two qualifications have been created and thirteen units developed to capture the skills required to grow medical cannabis, including skills and knowledge in regulatory requirements, security measures, propagation, plant care, maintenance, harvest and pre-processing. Four skill sets have been developed to support the skills for working in the medicinal cannabis industry, covering induction activities, cultivation, production and management roles.

Rural Merchandising & Sales Project

Rural merchandising workers provide vital support to Australian farmers and horticulturalists, facilitating the sale of products and services to keep agricultural and horticultural businesses efficient and economically viable. The national qualification and skills standards for rural merchandising were reviewed so they are up to date with evolving products and markets.