

JANUARY 2019

Nursery industry career pathways

Desktop review

Hort Innovation

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1 Introduction

1.1 PROBLEM STATEMENT

The nursery industry supply chain is a significant sector of the Australian horticultural industry. It employs almost 27,000 (19,000 full time equivalent) staff in around 1,800 small to medium enterprises (SMEs). The value of production for the year ending June 2016 was \$2.29 billion; encompassing plants grown for horticulture including, fruit and vegetables, landscaping and ornamental retail supply chains as well as forestry. Yet the industry, like many other agricultural and horticultural industries, faces major challenges around high staff turnover and an ability to attract and retain qualified people via offering attractive career pathways.

Industry training and development has been identified as a significant priority of the Australian nursery industry. This is documented in the Nursery Strategic Investment Plan (2017-2021) with better career development, one of the five industry outcomes identified in the SIP. Strategies to achieve required outcomes are identified as:

- Promoting the industry as a professional career choice
- Identifying future skill sets needed in the industry
- Collaborating with institutions about industry training and development needs
- Implementing a young leader and development program
- Using future innovators and young leaders to promote and adopt R&D and marketing outcomes within the industry.

1.2 BACKGROUND

Nursery production occurs in all states and territories of Australia, with the majority of production happening in Victoria, Queensland and New South Wales.

Attracting, retaining and developing a skilled workforce is a pressing challenge for all Australian agricultural and horticultural industries, not just the nursery sector. Several studies (Growcom, 2013; AgriFrood Skills Australia, 2015; RMCG & GVFGSWG, 2013) provide empirical evidence of skills issues and shortages in horticulture, including nursery production in Australia. The collective findings of these studies identify several driving issues contributing to the availability of skilled workers in horticulture, including:

- Low number of people attaining specific agriculture and horticulture qualifications
- Availability of training courses / services that are relevant, accessible in production regions, and cater for people in the workforce
- Labour competition from other sectors, including mining and coal seam gas
- Poor promotion of the industry as an employer of choice, including lack of clear career pathways within the industry
- Poor promotion of horticulture to people trained in relevant related disciplines such as logistics, business management, IT, engineering
- Small to medium enterprises cannot afford to employ several specialists; they require multi-skilled staff in management positions

- Seasonal and casual/part time nature of the work, inhibiting job security, on-the-job training and career progression as well as potentially requiring long working hours during the peak season
- Lack of regional level collaboration to build skilled and adaptive labour pools
- Industry image, employment conditions including remuneration and skilled supervision, work place conditions
- Remote locations affecting the ability of partners of those employed to find adequate work, quality of infrastructure (e.g. schools, childcare, hospitals, transport)
- The predominant disinterest of local unskilled labour to work in horticulture, and
- Reluctance by the local industry to engage skilled migrant labour or participate in seasonal worker programs due to factors including costs, the length of time seasonal workers may stay, facilities they have to provide for them, language and cultural barriers, and minimum work hour requirements.

1.3 OBJECTIVE OF THIS STUDY

This desktop review seeks to identify the necessary skills for nursery production in Australia, identify the skills shortage and establish an understanding of the inhibiting factors to attract, retain and develop an appropriately skilled workforce for the current and future needs of the industry. The desktop review aims to assess the characteristics of the Australian nursery industry, identify the universal challenge of a skills shortage in horticulture in Australia and address key review questions as outlined in Table 1-1.

Table 1-1: Desktop review questions

THEME	REVIEW QUESTION
Skills	<ul style="list-style-type: none"> ▪ What are the skill needs of the Australian nursery industry? ▪ What are the position and role types in the nursery industry and how do they form a career path (identify stepping stones)? ▪ What are the skill gaps?
Training	<ul style="list-style-type: none"> ▪ What are the sources of skilled/trained staff for the nursery industry? ▪ Who is providing these skills / training? ▪ What relevant courses (tertiary and VET*) are offered in: <ul style="list-style-type: none"> – Nursery / Amenity horticulture? – Production horticulture? – Agriculture? ▪ What are the enrolment and graduate trends? ▪ Are the training services offered meeting the needs of the nursery industry in relevance, ease of access, responsiveness, flexibility and capacity/skills/knowledge of trainers? ▪ What is required to include relevant training skill sets in VET training packages? ▪ What is required to provide training services that build on VET training (professional development)?
Attraction, retention & development	<ul style="list-style-type: none"> ▪ What are the current attraction, development and retention initiatives of the nursery industry? ▪ What are the comparative attraction, development and retention initiatives of other agricultural industries? ▪ Are there shared lessons / experiences from other industries that should be considered by the nursery industry?

2 Industry characteristics

The Australian nursery industry is a multi-billion-dollar sector that plays a vital part in the human, environmental and economic well-being of Australia. The diversity, uniqueness and significance of the sector, however, make it challenging to adopt a one size fits all model to attract, develop and retain a workforce.

The industry provides the plants that underpin two key areas of horticulture:

Urban and Environmental:

- Residential, commercial, industrial and public gardens, green space and developments
- Environmental and ecological restoration for land management, revegetation, natural area rehabilitation and erosion control
- Cut flower production

Rural and Agriculture:

- Production horticulture for fruit, nut and vegetable production
- Forestry spanning large scale plantations to agro-forestry
- Livestock production properties for forage and animal welfare management
- Medicinal, herbal and remedial products

2.1 INDUSTRY STATISTICS

In 2015-2016, Australia's nursery businesses produced \$2.29 billion of green life from the sale of 1.6 billion plants. There are around 1,800 production nursery businesses that employ almost 27,000 full and part-time and casual employees. The plants were produced across a variety of regions and environments with outdoor production and indoor production totalling 6,229 ha and 1,273 ha respectively.

The production nursery industry businesses cover the length and breadth of Australia and no two businesses are the same. On average, businesses nationally employ 15-16 people but this ranges from single operator organisations to those with more than 200 employees.

Business diversity in the Nursery Industry is vast with more than half of businesses considered 'micro businesses' with turnover of \$500K or less. Twenty seven (27%) of the industry has a turnover of between \$500,001 - \$2M and 10% of growers are turning over greater than \$3.5m.

Businesses nationally report that operating costs as an average percent of turnover are 28% and wages are 32%.

2.2 INDUSTRY WORKFORCE DEMOGRAPHICS

The key demographics of the current industry workforce, as provided by the NGIA (2018), are outlined as follows.

Gender split

- 72% male
- 28% female

Workforce age

The average age of a person working in the Nursery Industry is 54 years old.

- 15% - 18-39 years
- 49% - 40-59 years
- 36% - 60 and older

Employment type

27,000 people (or 19,000FTE) are employed by the Nursery Industry on a full time, part time and casual basis

- 50% - Full time
- 17% - Part time
- 32% - Casual/Seasonal roles

Employment role

- 78% - Nursery labouring
- 13% - Administrative
- 9% - Other

Location

83% of the Nursery Industry operates from the eastern states of Australia.

- 29% - Queensland
- 28% - Victoria
- 26% - New South Wales/ACT
- 8% - Western Australia
- 9% - South Australia, Tasmania, Northern Territory

3 Skills shortage in horticulture

3.1 THE NEED FOR SKILLS IN HORTICULTURE

Over the past decade, horticulture, the third largest agriculture sector in Australia behind livestock and grains, has moved beyond a 'market garden' mentality, to focus on business acumen including supply chain management, technology, product innovation and export competitiveness (RMCG, 2015). Pratley (2012) presents an argument that horticultural operations of today operate at levels of complexity that did not exist 20 years ago. Horticultural businesses are faced with a range of compliance responsibilities in the areas of biosecurity, workplace health and safety, pesticide management, food safety, customer relationships (ACCC Horticulture Code of Conduct) and environmental sustainability. Managing carbon emissions due to increasing concern over climate change is a further responsibility that may become compulsory.

More than just plant production and horticultural skills are required for the nursery industry in Australia. However, small to medium enterprises cannot afford to employ several specialists; subsequently they require multi-skilled staff in management positions. Additionally, business principles require greater attention through regular business activities including an increasing need for data capture and management for compliance and business efficiency. Marketing is increasingly becoming the responsibility of the business for products and processes including quality assurance, accreditation, logistics and supply chain relationships. To remain viable, horticulture businesses have to be technologically adept and remain 'cutting edge' e.g. with automotive processes across the production system, a plethora of precision agriculture application as well as data monitoring and management systems.

There is broad recognition that to remain internationally competitive and equipped to capitalise on opportunities, the horticulture industry needs to attract the best educated people (Pratley, 2012). There is also a need to secure a continued pipeline of well-trained experts to support the capacity of the industry into the future. Presently, horticultural businesses are struggling to attract and retain the necessary skilled workforce; this is forecast to cost the Australian horticulture industry \$1.55 billion in lost profit by 2020 (Horticulture Australia Ltd, 2008).

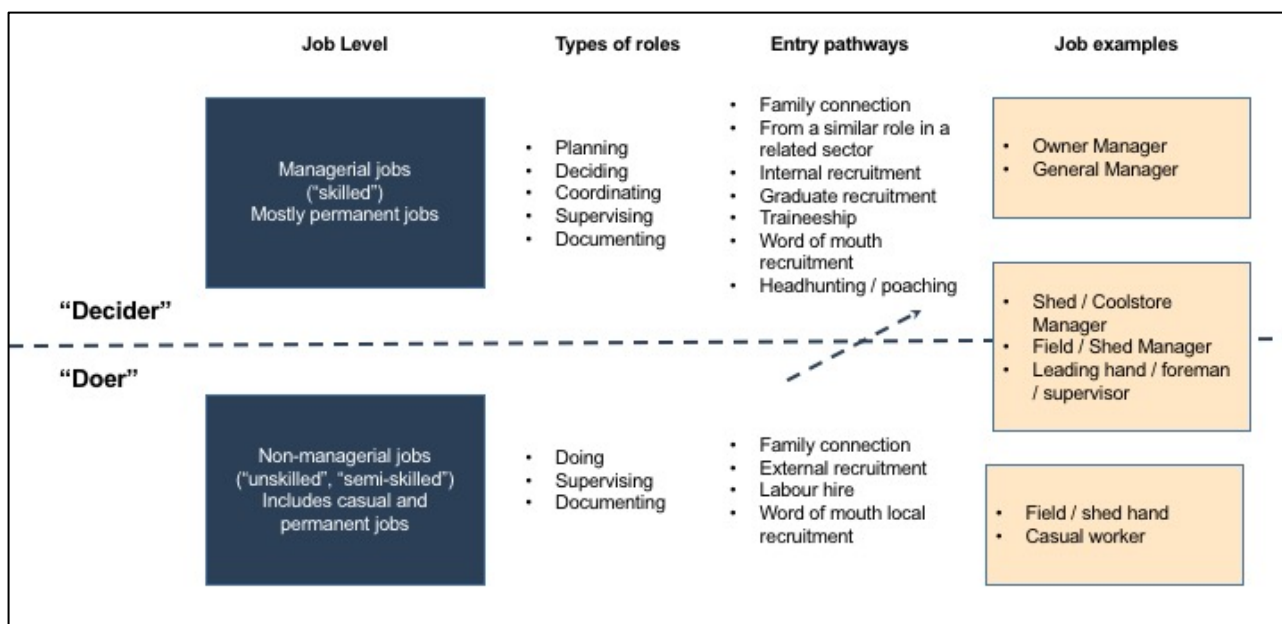
3.2 JOB LEVELS IN HORTICULTURE

A study by Santhanam-Martin and Cowan (2017) into skilled workforce issues provides a two-tier classification of job levels within the horticulture sector in Australia. This includes jobs which involve independent decision-making as managerial jobs ('deciders'), and jobs which are mostly about carrying out instructions provided by others as non-managerial jobs ('doers').

The classification of jobs as either a decider or a doer means different skill sets are necessary to perform tasks. Deciders are engaged in managerial jobs that rely on strategic thinking, risk management and business planning skills, combined with a sound technical knowledge to make decisions. While doer workers need to demonstrate competence in listening, understanding and completing required tasks; have the capacity to identify urgent problems or risks associated with tasks; and the ability to communicate and supervise other staff in implementing day-to-day tasks combined with the required technical knowledge. The level of technical knowledge required varies for both groups, depending on the level of responsibility and complexity of tasks.

This classification refers to employees, and their required skill set, as either being a decider or a doer as summarised in Figure 3-1.

Figure 3-1: Classification of horticulture job level (Adapted from Santhanam-Martin and Cowan, 2017)



3.3 CURRENT SKILL SHORTAGES IN HORTICULTURE

The range of tasks and skill requirements for both decider and doer jobs within horticulture businesses is diverse. A comparative study of the Australian vegetable industry, undertaken by RMCG (2015) identified gaps in skills as well as gaps in education and training offered to vegetable producers. The summary is presented in Table 3-1. With no equivalent study for the nursery industry identified, many of the issues identified for the vegetable industry are also representative of the amenity horticulture sector. It is important to note that the identified skills gap, as perceived by the industry, is actually a skills shortage or a shortage in the delivery of these skills.

Table 3-1: Identified horticulture industry skill shortages (RMCG, 2015)

KNOWLEDGE AND SKILL AREA	SKILL GAPS
Technology	Information technology, machinery & equipment, precision horticulture, spatial technology, remote sensing, GPS/GIS, vision/sensing technology (e.g. for grading or in the field), robotics, irrigation technology, spray application technology, waste management, energy efficiency
Production environment	Climate/climate change, landscape / land capability / site selection, natural resource management / sustainability, water resources / quality, resource use efficiency, emission management, carbon farming, environmental sustainability, site selection
Field production and advanced crop management	Soil management, crop nutrition / fertilisers, plant health and crop protection, machinery & equipment, irrigation management, integrated crop management, agronomy, sustainable production, variety selection, on-farm research methods (farm trials)
Protected Production/Hydroponics	Structures/crop covers, hydroponics, greenhouse soil / substrate management, nutrition management / fertilisers, plant health and crop protection, climate and atmosphere control, machinery & equipment, irrigation management, integrated crop management
Postharvest Management	Grading, cool chain management, post-harvest physiology, packaging, storage, temperature and atmosphere control, logistics, transport/shipping, distribution, food safety, waste management
Managing the Business	Strategy, financial management, business planning/management, cost of production, record keeping, investment decisions, commercialisation, managing growth, compliance (legislative / regulatory), quality systems, managing risks
Products to markets	Understanding markets and consumers, marketing / promotion / selling, exporting, product development, supply chain management, product development
People	Leadership & management, conflict management / negotiation, WH&S / OH&S, managing staff, mentoring, people development, managing apprentices, labour management, communication
Information transfer	Adult learning, consulting, extension methodologies, facilitation, communication e.g. via public media, public speaking

3.4 SKILLS GAP OUTLOOK

In addition to existing skills shortages within the production horticulture sector, several emerging issues have been identified that may challenge future skills and skill development in horticulture. An assessment by the Australian Industry Skills Council (2016), identified several drivers and potential future skill gaps as relevant to horticulture as summarised in Table 3-2.

Table 3-2: Skills Outlook (Australian Industry Skills Council, 2016)

DRIVER	SKILLS OUTLOOK
Transition to ongoing implementation of new processes and technologies in irrigation.	Skills required around various types of irrigation such as pressurized irrigation operations and gravity fed irrigation systems.
The National Agvet Chemical Task Force working group harmonisation to chemical training requirements, including a review of state based regulatory frameworks and future developments in managing spray drift risks.	Skills required in the industry are required to reflect the recommendations of the Task Force.
Transition to new technology and processes used in conservation and land management.	New knowledge and operational capacity to optimize technology.
Recent deaths on Quadbikes has led to concern over the safety of operation. New Machinery may be used instead of quads (drones).	Concern regarding the level of skills of quadbike operators. New and emerging skills will be required for the use of new technology such as drones.
Over reliance on chemicals to manage pests is causing concerns environmentally with increasing resistance to chemicals requiring new variants of chemicals to be developed. A holistic approach of balancing chemical use with a greater use of introducing beneficial insects and use of organic rather than chemical agents will be more environmentally sustainable benefitting the overall ecosystem.	Industry requires skills in botanical knowledge, pruning techniques, grafting techniques, plant identification, pest identification, integrated pest management, and identifying soil/media composition.
Free trade agreements have opened opportunities for market access to Australian farmers.	Skills required in how to export food to emerging markets and global logistics.
Investment in integrated technology, such as robotics and digital and wireless technology to monitor farm operations and detect crop issues.	Need for skills in strategic planning, risk management, mergers and acquisitions, online marketing business development and financial planning to respond to the dynamic and changing operating environment, with increased competition and opportunities to reach global markets.
Increasing market demand for innovation in product development to ensure viability of enterprises.	New knowledge and operational capacity related to innovation and product development.
Growing investment in integrated farm technology, quality standards and data analysis are expected to influence the roles of farmers. Continuous development of biotechnology with new discoveries providing the potential to support farmers with emerging challenges, including those arising from climate change, pressure on global food supplies and fresh water, and the management of pests and diseases, will add to the vocational outcomes of agricultural work sector.	In response to climate change and government policy, knowledge of relevant science, digital and analytical skills, assessing crop health, data capture from a range of devices, and strategic planning and business management.

4 Skills

4.1 SKILLS SHORTAGE IN AGRICULTURE

Detailed studies assessing industry specific skill shortages are limited, and where available, are based on high level, cross industry aggregated datasets. Despite this, there is a rhetoric around the factors that are seen to contribute to skill shortages, particularly in regional Australia, which include structural changes to the economy, ageing workforce, environmental factors including prolonged drought, labour competition from other industries, migration of workers from regional areas to metropolitan centres and suitability of regional infrastructure. The availability of regional infrastructure is particularly important to ensure an adequate level of facilities to attract and retain a skilled workforce, and may consider services including schools/education, hospitals and health services, telecommunications, transport, council services, housing, after hours/holiday activities and shopping. The perceived poor image of agricultural industries also plays an important role.

"I have to say that industry works very hard on not portraying a very attractive profile, to be frank, so it is somewhat understandable that careers advisers perhaps are not breaking their necks to recommend careers in agriculture and horticulture to young people when the industry itself says the things about itself that it does. That needs to be corrected, and some of us are working on that at the moment." - Cornish, 2007

The impact of skill shortages has been widely identified, including lower levels of production, higher production costs and loss of competitiveness, and in turn lower opportunities for economic growth.

There is broad recognition for government intervention to address the risks associated with skills shortages through a variety of measures. These include improving and increasing vocational training and targeted training initiatives to meet the need of horticultural businesses, skill immigration programs, and the employment of skilled workers on temporary work visas. In addition to direct programs to support skills development, there is also recognition of the need for indirect support to attract skilled workers to regional areas, through developing and upgrading regional infrastructure and services to meet workforce needs. The National Farmers Federation (2013) for instance, argues that better access to health, education, transport and telecommunications infrastructure will help retain and attract skills to regional areas.

There is recognition of the national barriers to meeting industry needs for labour and skills include low levels of industry involvement in formal education and training, poor promotion of agricultural pathways and the limited capacity of the current education and training system to deliver relevant and innovative training solutions (Industries Development Committee Workforce, 2009).

4.2 SKILL NEEDS OF THE NURSERY INDUSTRY

An assessment of common positions in the nursery industry was undertaken in regard to the technical (hard) and interpersonal (soft) skill needs as presented in Table 4-1. Relevant qualification levels are also identified (Industry Training Australia, 2018).

Table 4-1: Career pathways for the nursery (production and retail) industry (Industry Training Australia, 2018)

POSITION	SKILLS (HARD)	SKILLS (SOFT)	QUALIFICATIONS
Production Nursery Assistant	<ul style="list-style-type: none"> ▪ Application of chemicals under supervision ▪ Operation of large machinery ▪ Undertake various nursery propagation activities ▪ Plant identification 	<ul style="list-style-type: none"> ▪ Communication skills ▪ Ability to work in a range of environments ▪ Punctuality 	Certificate II in Production Nursery
Nursery Sales Assistant	<ul style="list-style-type: none"> ▪ Maintain health of nursery stock ▪ Plant identification ▪ Assist with sales tasks ▪ Manage finances 	<ul style="list-style-type: none"> ▪ Strong work ethic ▪ Ability to accept feedback ▪ Work effectively in a team environment ▪ Reliable 	Certificate II in Retail Nursery
Production Nursery Tradesperson	<ul style="list-style-type: none"> ▪ Conduct a range of tasks relating to safe storage and transportation, preparation, and application of chemicals ▪ Identify and control pests, weeds, and diseases ▪ Construct and maintain irrigation systems ▪ Understand a range of issues relating to plant health 	<ul style="list-style-type: none"> ▪ Strong work ethic ▪ Critical thinking ▪ Experience dealing with a range of different personalities 	Certificate III in Production Nursery
Retail Nursery Tradesperson	<ul style="list-style-type: none"> ▪ Engage with customers on a daily basis ▪ Maintain health of nursery stock ▪ Have an in-depth knowledge of various plants and their growing conditions ▪ Identify and control pests, weeds, and diseases 	<ul style="list-style-type: none"> ▪ Team building ▪ Decision-making skills ▪ Interpersonal skills ▪ Enthusiastic 	Certificate III in Retail Nursery
Production Nursery Supervisor	<ul style="list-style-type: none"> ▪ Supervise nursery production teams ▪ Develop a range of soil and plant health monitoring plans. ▪ Supervise and monitor the performance of employees ▪ Effectively communicate and interact with employees and customers ▪ Implement and maintain work place health and safety programs 	<ul style="list-style-type: none"> ▪ Highly organised ▪ Strong work ethic ▪ Critical thinking ▪ Logical thinking ▪ Problem solving 	Certificate IV in Production Nursery
Retail Nursery Supervisor	<ul style="list-style-type: none"> ▪ Supervise nursery logistics ▪ Manage an effective work team ▪ Supervise and monitor the performance of employees ▪ Effectively communicate and interact with employees and customers 	<ul style="list-style-type: none"> ▪ Resourceful ▪ Willing to learn ▪ Cooperative 	Certificate IV in Retail Nursery

Production Nursery Manager	<ul style="list-style-type: none"> ▪ Effectively coordinate and complete production tasks that will increase the productivity of the business ▪ Apply extensive knowledge of plant taxonomy to business operations ▪ Implement a range of plant, water and nutrient management plans ▪ Lead and manage a production team in an effective manner ▪ Management of machinery and equipment 	<ul style="list-style-type: none"> ▪ Sufficient verbal and written communication skills ▪ Make deadlines ▪ Business etiquette ▪ Decision making ▪ Dispute resolution 	Diploma of Production Nursery
Garden Centre Manager	<ul style="list-style-type: none"> ▪ Manage finances and nursery logistics in a safe and profitable manner to increase the profitability and sustainability of the business ▪ Understand the fundamentals of business management ▪ Apply extensive knowledge of plant taxonomy to business operations ▪ Manage employees in an effective manner ▪ Monitor and manage store facilities 	<ul style="list-style-type: none"> ▪ Conflict management ▪ Leadership ▪ Ability to deal with difficult managerial situations 	Diploma of Retail Nursery Management
Horticulture Business Manager	<ul style="list-style-type: none"> ▪ Analyse and develop business management plans ▪ Manage human resources ▪ Analyse and manage a range of tasks relating to business performance ▪ Implement planning and budget monitoring programs to effectively sell stock 	Logical thinking	Advanced Diploma of Horticulture Bachelor of Horticulture Master of Urban Horticulture

5 Training

5.1 EDUCATION AND TRAINING PROVIDERS

The current Australian institutional and organisational structures supporting education and training in agriculture include state and federal departments of agriculture and natural resource management, private extension providers, private agricultural businesses, vocational education and training (VET) providers, the national training authority, state training authorities, industry training advisory bodies, research and development corporations, universities, farmer organisations, and other non-government organisations (RTOs and non-registered organisations). Increasingly, online training services are offered for agricultural audiences. These online providers may not always be Australian based.

Most formal education and training providers are government (plus fee) funded on a 'throughput of students' basis; there are no rewards attached to outcomes on farms or impacts on profitability of the industries serviced. Some VET providers work closely with industry e.g. with an industry controlling content and, to a degree, delivery mechanisms (e.g. the cotton or dairy industry). This provides a closer link between industry needs and training services.

5.2 NURSERY TRAINING (PRODUCTION AND RETAIL)

There are currently two streams of nursery courses offered, Retail Nursery and Production Nursery, with qualifications ranging from Certificate II to Diploma level (Commonwealth Department of Education and Training, 2018) as outlined in Table 5-1. The design and structure of the training programs are conducive to providing clear career pathways for potential students and a comprehensive skill development framework.

There are currently limitations on the offering of these courses in Australia. As outlined in Table 5-2, offered courses include one grafting course, six Certificate III in Retail Nursery, five Certificate III in Production Nursery, and one Diploma in Retail Nursery. There were also no courses offered in Queensland Western Australia, South Australia, or Tasmania.

Table 5-1: Available VET Courses (ACH10 Package) in retail and production nursery in Australia

CODE	TITLE
AHC20816	Certificate II in Retail Nursery
AHC20716	Certificate II in Production Nursery
AHC31216	Certificate III in Retail Nursery
AHC31116	Certificate III in Production Nursery
AHC40716	Certificate IV in Retail Nursery
AHC40616	Certificate IV in Production Nursery
AHC50916	Diploma of Retail Nursery Management
AHC50816	Diploma of Production Nursery Management

Table 5-2: Registered VET institutions to deliver nursery courses (production and retail)

COURSE	CODE	INSTITUTION
Certificate II in Production Nursery	AHC20716	<ul style="list-style-type: none"> Australian College of Agriculture & Horticulture FITEC Australia Horticultural Training Pty Ltd Kangan Institute Riverina institute of TAFE TAFE NSW
Certificate III in Production Nursery	AHC31116	<ul style="list-style-type: none"> Gordon TAFE South Melbourne TAFE Sunraysia Institute of TAFE Swinburne University of Technology Melbourne Polytechnic South West TAFE Advance Community College Australian College of Agriculture & Horticulture Australian Consolidated Training Bendigo TAFE Kangan Institute
Certificate IV in Production Nursery	AHC40616	<ul style="list-style-type: none"> Australian College of Agriculture & Horticulture Horticultural training Pty Ltd TAFE NSW
Diploma of Production Nursery Management	AHC50816	<ul style="list-style-type: none"> Australian College of Agriculture & Horticulture Horticultural Training Pty Ltd
Certificate II in Retail Nursery	AHC20816	<ul style="list-style-type: none"> Kangan Institute TAFE NSW - North Sydney TAFE NSW - Western Sydney
Certificate III in Retail Nursery	AHC31216	<ul style="list-style-type: none"> Gordon Institute of TAFE Swinburne University of Technology Holmesglen Institute of TAFE Melbourne Polytechnic Bendigo TAFE Kangan Institute Horticultural training Pty Ltd TAFE NSW - North Sydney TAFE NSW – Hunter
Certificate IV in Retail Nursery	AHC40716	<ul style="list-style-type: none"> Horticultural Training Pty Ltd
Diploma of Retail Nursery Management	AHC50916	<ul style="list-style-type: none"> Horticultural training Pty Ltd

5.3 TERTIARY QUALIFICATIONS

Several targeted tertiary qualifications streams are offered through a number of institutions, relevant to nursery industry skill requirements. These institutions and degrees are outlined in Table 5-3.

Table 5-3: Available nursery relevant tertiary qualifications

INSTITUTION	DEGREE
Charles Sturt University	▪ Bachelor of Horticulture
University of Melbourne	▪ Master of Urban Horticulture
University of Queensland	▪ Bachelor of Applied Science (Urban Horticulture of Horticulture major)
University of New England	▪ Bachelor of Agriculture (Plant Production major)
University of Sydney	▪ Bachelor of Science in Agriculture (Plant Production specialisation)
Western Sydney University	▪ Bachelor of Sustainable Agriculture and Food Security
University of Tasmania	▪ Bachelor of Agricultural Science (Horticulture major)

5.4 ENROLMENT AND GRADUATE TRENDS

There has been a national trend of declining enrolment and graduation in higher education qualifications across all of agriculture, including amenity horticulture at both a TAFE and university level in recent years. An example, of the low enrolment pattern trends have been observed with the Bachelor of Horticulture undergraduate degree, offered through Charles Sturt University. Enrolment and graduations by year, data provided by CSU (2017) presented in Table 5-4, highlight a pattern of consistently low enrolment (a minimum enrolment of 25 students is required for a course to be considered viable). The even lower graduation numbers are attributed to agricultural courses having a low minimum academic entry level requirement, and students using agricultural courses as an enrolment gateway to changes courses at a later date.

Table 5-4: Enrolment and graduates in CSU Bachelor of Horticulture (CSU, 2017)

YEAR	2010	2011	2012	2013	2014	2015	2016	2017
Commencing enrolments by year	?	?	14	15	25	23	21	9
Graduated students	1	4	3	3	2	0	2	?

The graph illustrated in Figure 5-1 provides a summary of graduate data for all tertiary institutions offering a horticulture qualification. This trend is cause for alarm, as not only do declining graduations affect the availability of skilled workers (less than 40 graduates in 2015), it also affects viability of training providers to continue to provide relevant training with many of these institutions no longer offering horticulture courses (Pratley, 2017).

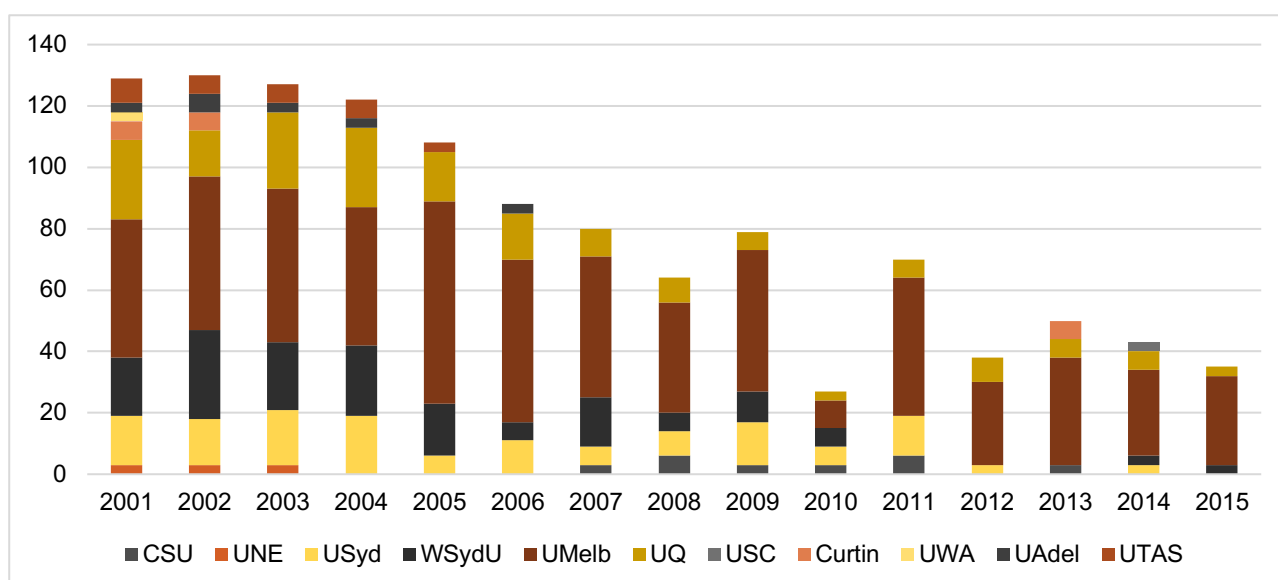


Figure 5-1: Horticulture graduates by university, 2001 - 2015

A similar trend is observed in the VET sector. Table 5-6 outlines student enrolments in the Agriculture, Horticulture and Conservation Land Management Training package (AHC) in 2012, separated by level of qualification¹. The enrolment numbers presented highlight horticulture is in a competitive training market, attracting only 10 per cent of students in an already diminishing market of agricultural studies. Participation rates in the lower certificate levels are also greater, causing concern about the extent and capacity of skills developed in horticulture through the level of training delivered. It is understood this trend has continued in subsequent years, which contributes to many courses not being offered and restricting the actual availability of training.

Table 5-6: Total AHC10 Student and Course Commencements, 2012 (NEST, 2014)

SECTOR	CERT 1.	CERT 2.	CERT 3.	CERT 4.	DIP.	ADV DIP	TOTAL
Agriculture	0	4,343	2,579	831	435	35	8,223
Production Horticulture	0	142	623	505	59	0	1,329
Agriculture services	881	1,143	1,018	197	0	0	3,239
Total Agriculture	881	5,628	4,220	1,533	494	35	12,791
	7%	44%	33%	12%	4%	0.27%	Rounded

Within the horticulture category, there are some positive trends for the nursery and garden industry sector, however, with students favouring enrolment in amenity horticulture courses over production horticulture. The relative completions of amenity and production horticulture between 2012 and 2016 is outlined in Figure 5-2. This graph clearly shows a stronger performance for amenity horticulture courses over production horticulture.

The skills shortage in the nursery industry is exacerbated by the fact that nursery qualifications are unfavourable amongst students, with some nursery qualifications being the least popular qualifications in both 2015 and 2016 (Skills Impact, 2018). Similarly, included in the array of horticultural/agricultural TAFE

¹ Note National Centre for Vocational Education Research (NCVER) data has not been included as the agriculture category includes environmental and other related studies as well as land management including RTD,RTE,RTF,RUA,AGF,AGR

qualifications with no enrolments in 2016 were several nursery qualifications. There are a number of industry priority skills that are outlined for the horticultural/agricultural fields for 2018-2021², aimed to enhance the sustainability of the industry. One of those being improving the skills in integrated pest management, growing media and environmental control in production nurseries. The driver for this is due to the fact that current qualifications have a high reliance on chemicals for controlling pests, weeds, and diseases.

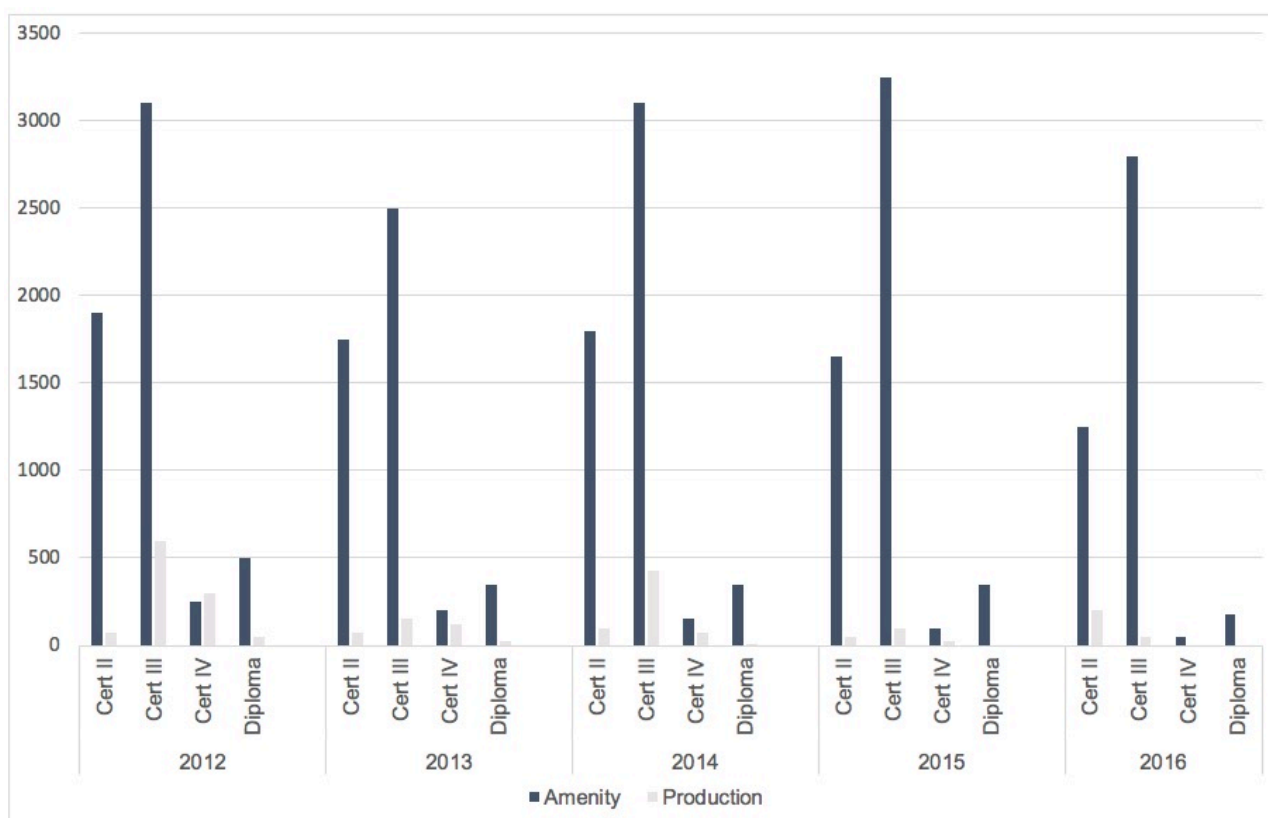


Figure 5-2: Relative completions in amenity and production horticulture 2012 – 2016 (Pratley, 2017)

5.5 EMPLOYMENT PROJECTIONS

Australian census data predicts that the agriculture, horticulture and agricultural product wholesaling industry in Australia employed and approximate 261,000 people in 2016. Of this, 4% were employed in the nursery and floriculture production industry.

Information obtained from the Australian Industry Skills Committee (2018) provides a snapshot on the employment projection for the nursery industry. Figure 5-3 shows the projections for a range of horticultural industries over the next 5 years. The two representing the nursery industry, Nurserypersons and Garden and Nursery Labourers, show insignificant growth over the next 5 years. As illustrated in Table 5-3, this projection is similar to many other horticultural industries in Australia, with the exception of gardeners which has a forecast strong growth projection.

A report completed by Skills Impact (2018) in relation to the skills forecast for the Agriculture, Horticulture and Conservation and Land Management sectors states there is a projected growth of 5.8% in employment in nursery and floriculture production from May 2017 – May 2022. The study also highlights a trend anomaly,

² Skills Impact 2018, IRC Skills Forecast and Proposed Schedule of Work 2018-2021 for the Agriculture, Horticulture and Conservation and Land Management Industry Sector

with employment levels of gardeners, nursery labourers, and nursery persons being less in 2016 than in 2006 indicating a decline in employment numbers.

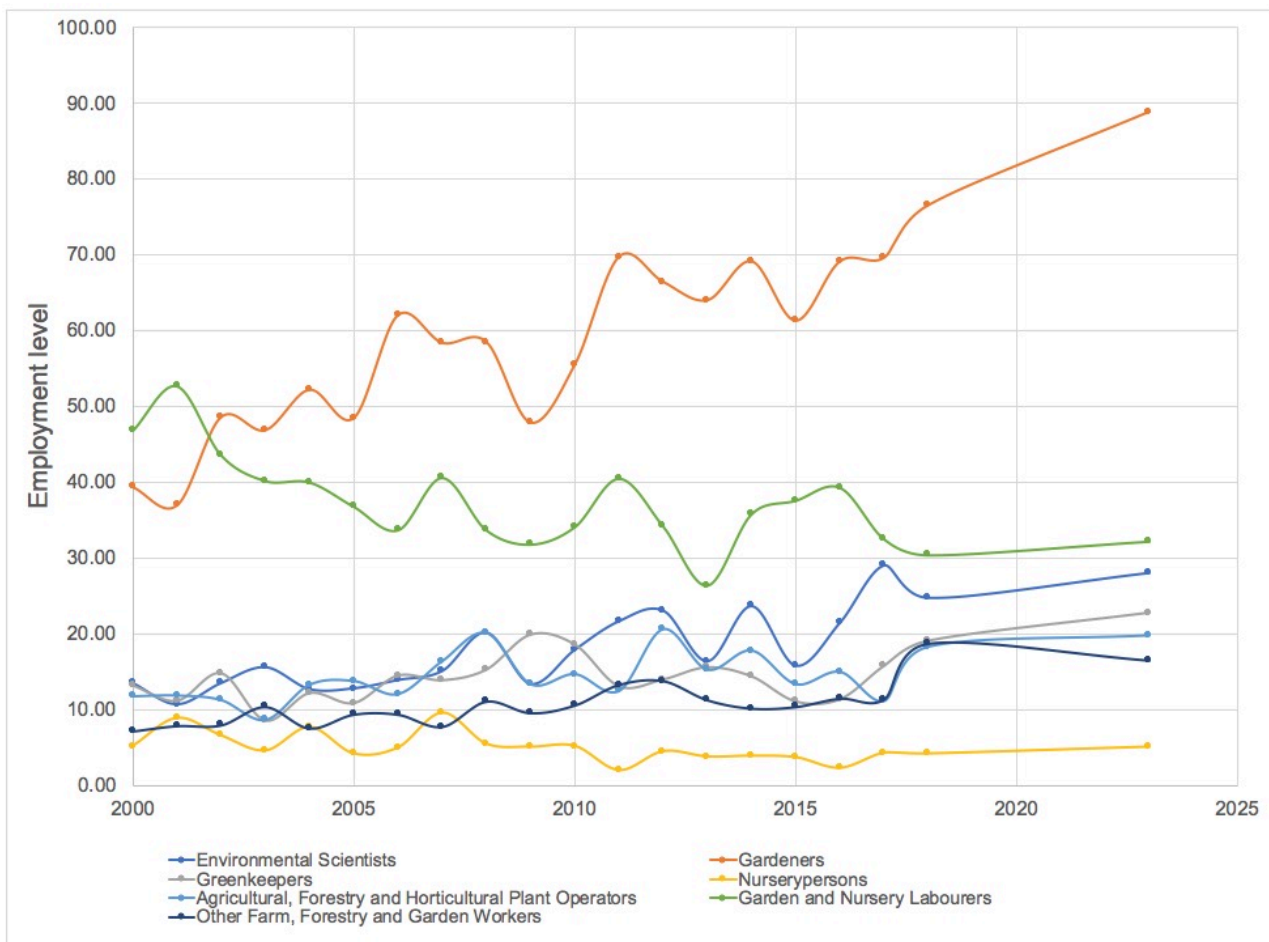


Figure 5-3: Nursery sector employment level and projection (Skills Impact, 2018)

5.6 INTERNAL UPSKILLING AND RECRUITMENT PRACTICES

There is evidence of mixed practice across horticulture industries in Australia with respect to workforce upskilling. A report by Macquarie Franklin (2012) in the Australian vegetable industry concluded that growers tend to have “apathy” to training their workers, and in most cases, only participate for financial, market or legislative imperatives. Despite the negative connotations regarding apathy, this approach would appear to suggest a high level of value is attributed by employers to the development of business relevant skills (RMCG, 2015).

This approach is reflected in an observed preference to build the skills of existing staff to enable internal recruitment for increasingly skilled positions. Internal skill development is seen to value the understanding of existing employees have of the business, and how particular tasks are approached. A study by Santhanam-Martin and Cowan (2017) observed internal recruitment as a risk management strategy to ensure the appropriateness of candidates to business culture. Where new or additional skills were required that had to be sourced externally, businesses tended to assess potential candidates based on industry experience, and recommendations for others in the industry, rather than their formal qualifications.

5.7 CAREER PATHWAYS

Many horticultural employers prefer to recruit internally, due to the importance that they place on business specific knowledge. Internal promotion also allows managers to 'hand pick' candidates who have shown motivation and aptitude in their prior position.

However, most businesses rely on both external and internal recruitment when a position becomes vacant or the business grows. External recruitment is more common in 'doer' jobs, such as crop husbandry, picking and packing, due to the unskilled to semi-skilled nature of the positions. As these jobs usually offer only seasonal work, they are often filled by migratory workers who are recruited through external labour hire companies. 'Decider' jobs are often filled using internal recruitment, however, roles such as farm, business, personnel, compliance, marketing or logistics managers, will be recruited externally, especially in larger businesses.

Often, throughout a worker's career, there is potential for them to move between jobs, such as field work and packing shed work, or 'up the career ladder', as employees are internally recruited from "doer" to 'decider' roles or between 'decider' roles. This shows that there is an opportunity for career progression and career pathways in horticultural careers.

Several examples of career pathways have been prepared for the nursery sector by training providers to outline career progression based on qualification attainment. Examples of this are provided for production nursery (Figure 5-4) and retail nursery (Figure 5-5). However, these career pathways imply that there are easy pathways to move from one sector to another. In reality this is not always the case, for example working in the turf industry is quite different to nursery production.

This highlights the importance and role of industry in the development and involvement throughout the career pathway to ensure understanding of industry requirements and that the skills gained are those that best suit the industry.

Figure 5-4: Career pathway for production nursery (Melbourne Polytechnic)

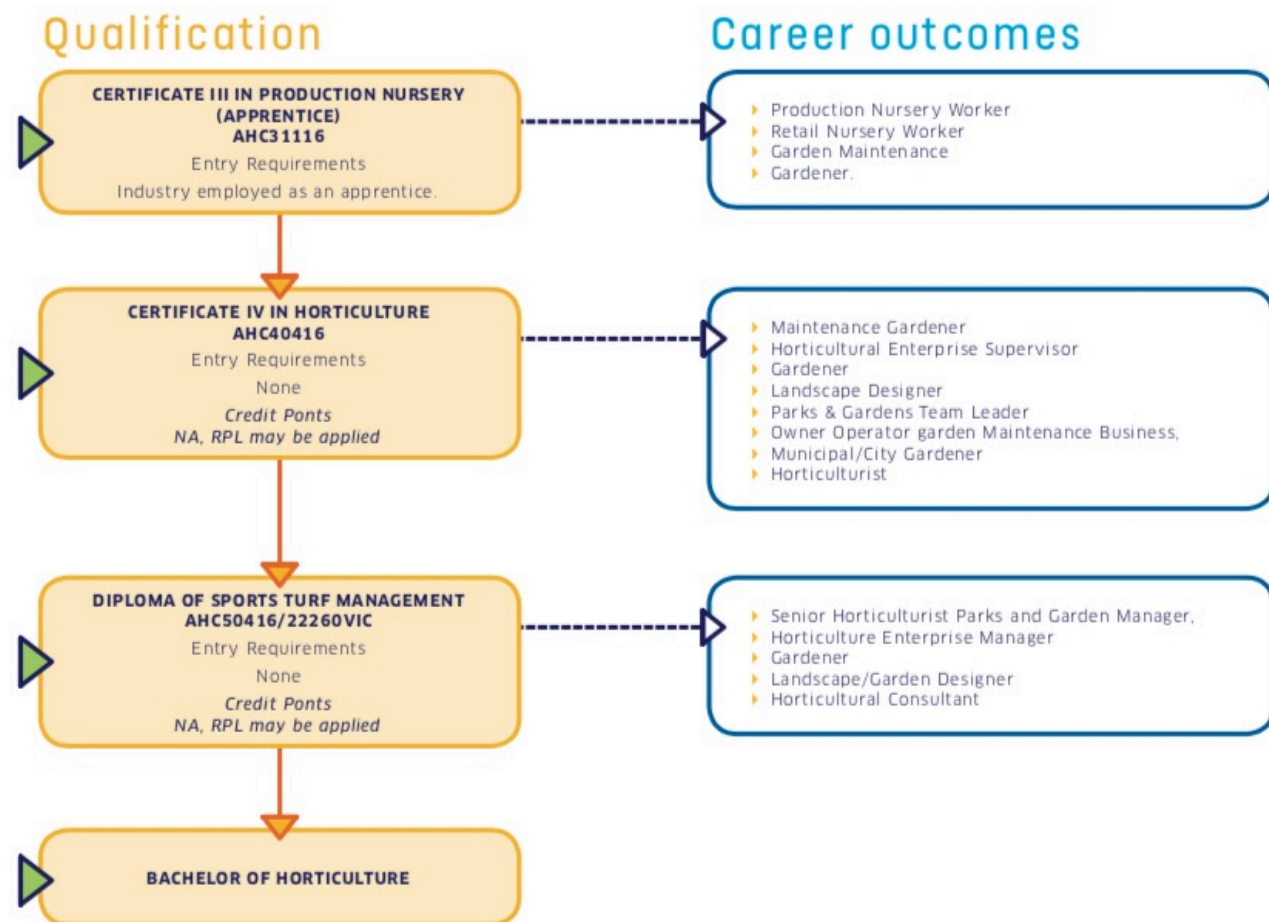
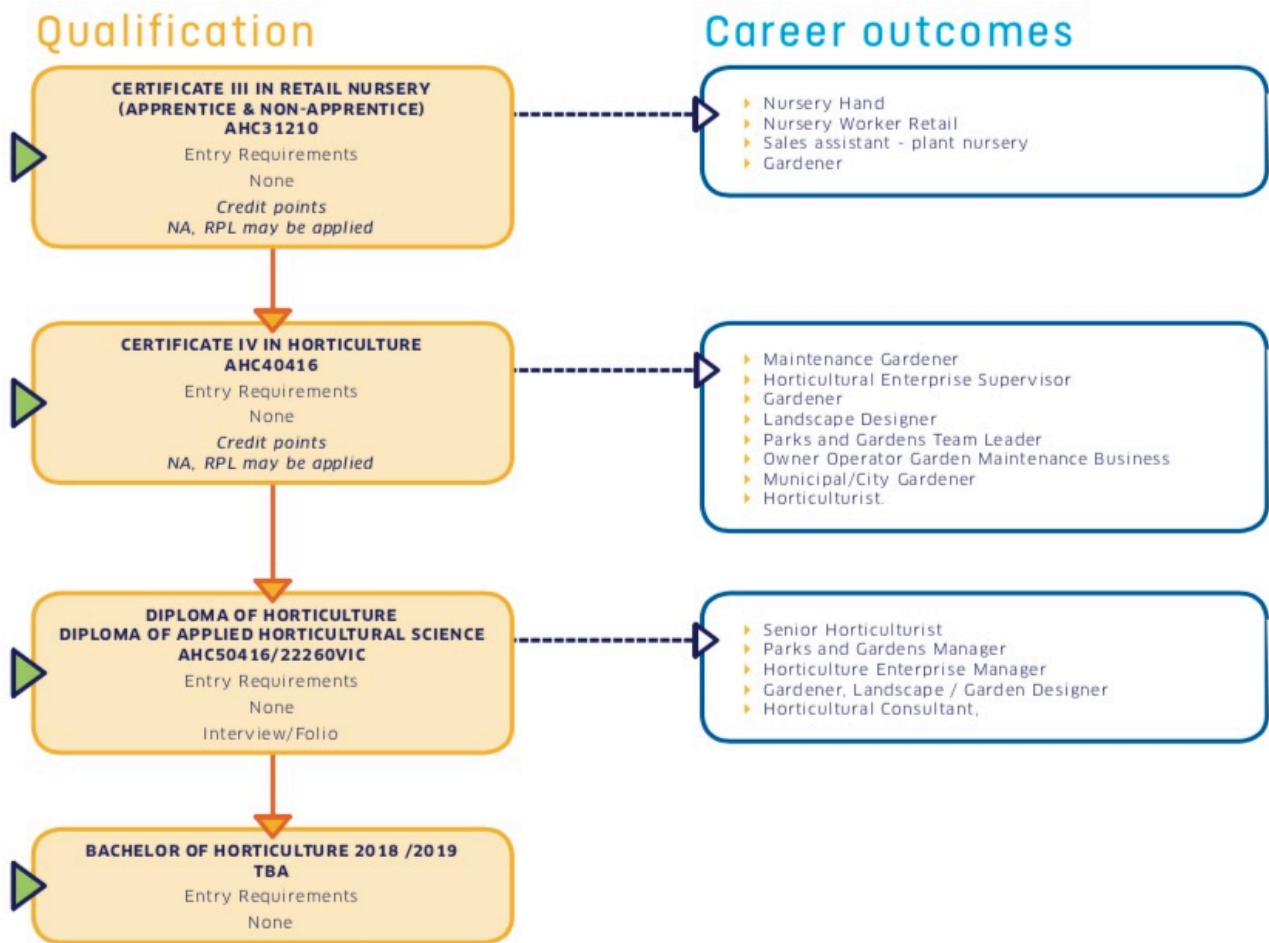


Figure 5-5: Career pathway for retail nursery (Melbourne Polytechnic)



6 Attraction, retention and development

6.1 EXISTING INITIATIVES

There are several existing Hort Innovation projects funded, including contributions from the nursery industry development fund, to support the attraction, retention and development of the nursery industry workforce. These projects are strategically aligned to support and build on outcome 5 of the Nursery Strategic Investment Plan 2017-2021 – *better career development*. The projects are summarised and include:

- Green Industry Growing Leaders Program (MT16002)
- Global Master Class (LP15001)
- Attracting new entrants into Australian Horticulture (LP15006)
- Advancing women's leadership across the Australian horticultural sector (LP16000)
- Engaging leaders in the Australian horticulture industry (LP16001)

GREEN INDUSTRY GROWING LEADERS PROGRAM (MT16002)

This project intends to enhance the skills and knowledge of leaders and aspiring leaders enabling them to better manage teams and ensure their business stays at the forefront of the growing nursery industry. Conducted over 3 phases, involving leadership forum meetings and workplace projects, the program aims to provide tools and skills to people in the nursery industry to develop the capacity to lead a team. These include:

- Establish focussed goals
- Understand your behavioural drivers
- Develop 'metrics that matter'
- Learn to 'give up' the unnecessary
- Learn to pace any change program realistically
- Develop and progress using The Right Mind 'Buddy Concept'

The project is currently being run on a yearly basis and seeks to involve twenty representatives from a range of different nursery backgrounds (Hort Innovation, 2017).

GLOBAL MASTER CLASS (LP15001)

The Masterclass in Horticultural Business has been designed to encourage growers and people involved in the horticultural sector to take their operation and career to the next level. Supported through the Hort Frontiers Leadership fund, the Masterclass focusses on global trends in horticulture, international business, innovation, value chains, governance and risk, to help individuals expand their horizons and be leaders in their fields. The Masterclass has been developed by world leaders in the horticultural industry including: Wageningen University & Research and Lincoln University, and is delivered by the University of Tasmania. Delivered over a ten-month period, the program covers a series of topics including:

- Horticultural Management
- People and Culture
- Supply Chain Management and Logistics

- Financial Management and Law
- Horticultural Marketing and Communication
- Global Trends and International Business
- Innovation and Entrepreneurship
- Business Development and Strategy

The Masterclass is intended to attract a diverse cohort of 30 people, with three individuals from the nursery industry able to achieve a full scholarship for the course (Tasmanian Institute of Agriculture, 2017).

ATTRACTING NEW ENTRANTS INTO AUSTRALIAN HORTICULTURE (LP15006)

This project has been designed to attract final year university students, studying a range of disciplines, to the horticulture sector. Conducted over two phases, the project involves a 10-12 week internship, and 1 year graduate program in a horticulture focussed workplace. In the first phase, the students get real life exposure to the horticulture industry and have the chance to engage with growers, people in the industry, and the greater horticulture supply chain. The second phase allows the graduates to develop their skills and knowledge of horticulture and partake in a 5 day industry leadership program to encourage the development of future leaders. The key objectives of the project are to:

- Increase graduate interest in careers across the Australian horticulture sector.
- Build a new pool of industry leaders and create networks of young professionals to drive further innovation across the sector.

The project is currently being led by agriculture recruitment company, Rimfire Resources, and is designed to use an allocated \$3.9 million to open up the doors of the horticulture industry to university leavers (Hort Innovation, 2017).

ADVANCING WOMEN'S LEADERSHIP ACROSS THE AUSTRALIAN HORTICULTURAL SECTOR (LP16000)

Collaboratively funded through Hort innovation and Woman & Leadership Australia (WLA), the women's leadership development project intends to foster gender progression and equality in the horticulture industry. Focussing on women who are emerging leaders or have mid-level management and leadership experience, this project offers a scholarship that covers almost 60% of the program fee for the following courses:

- Accelerated Leadership Performance Program
- Executive Ready
- Advanced Leadership program

The courses are part-time and delivered both online and face-to-face, they commence several times a year with face-to-face units run in Sydney, Melbourne, Brisbane, and Perth. Each course intends to attract a diversity of woman who possess a wide range of skillsets (Women & Leadership Australia, 2018).

ENGAGING LEADERS IN THE AUSTRALIAN HORTICULTURE INDUSTRY (LP16001)

The Horticulture Alumni project intends to create a community of like-minded industry leaders who collaborate and help progress the horticulture industry. The group consists of a diverse range of people that are involved in a wide range of jobs across the horticulture sector. The project is currently in its infancy but is attracting an

ever-growing number of industry professionals passionate about the future of horticulture (Hort Innovation, 2017).

6.2 EVIDENCE FROM OTHER AGRICULTURAL INDUSTRIES

Other agricultural industries have provided clear pathways for individuals entering the industry showing how they are able to progress and develop. This includes information on why the industry is important, the extensive opportunities in the industry, as well as information on how to obtain qualifications.

6.2.1 DAIRY AUSTRALIA

Dairy Australia provides one of the better examples of what an industry can achieve to address a skills shortage challenge, and attract interest in a primary industry as a career path through their Stepping Stones program.

The Stepping Stones program provides information on the different types of careers on a dairy farm and explores the different pathways available for people who are either looking to start a career on a dairy farm, or for experienced people who want to progress their dairy career further.

The program provides relatable dairy farmer and staff profiles from around Australia, advice on dairy careers, progression and great career tips from farmers. The Planning Your Dairy Career section is a practical tool that can be used to assess where you are, set your short and long term goals and work out your next steps to achieve them, as illustrated in Figure 6-1.

Dairy Australia also provides a number of accessible resources and events for schools to support awareness of career paths in the industry, including:

- school camps where children can learn hands on about the industry
- webinars
- promotion of the role of women in the industry
- industry events
- hosting the Discover Dairy website (<http://www.dairy.edu.au/DiscoverDairy>)

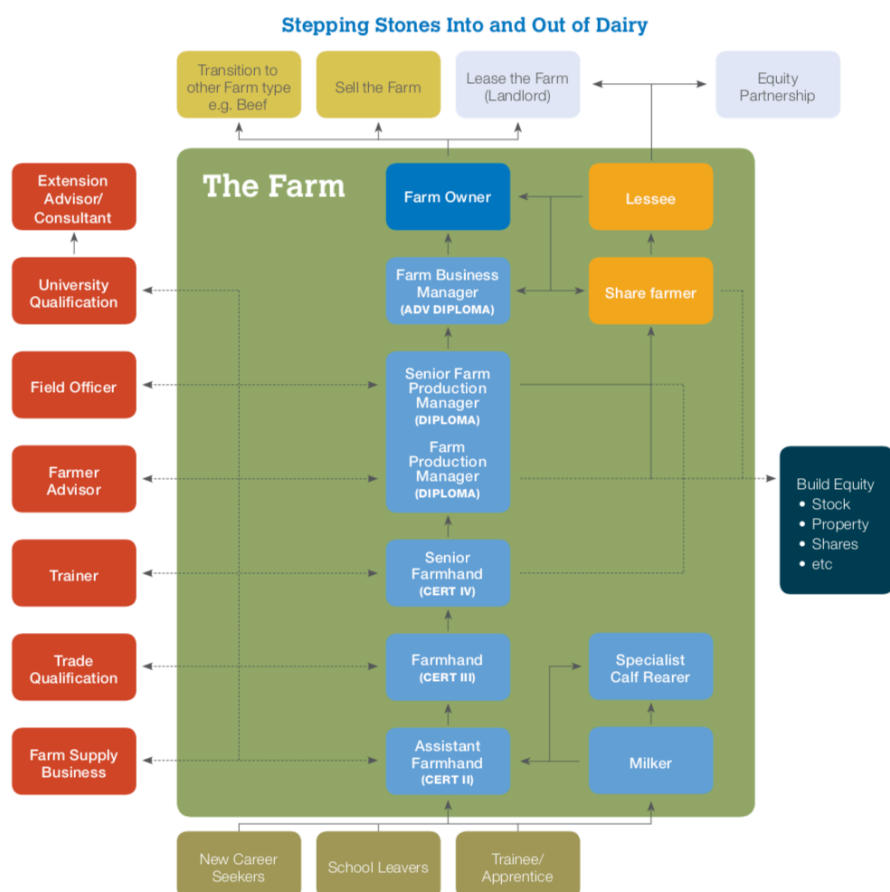


Figure 6-1: Dairy Australia Stepping Stones Program (Dairy Australia, 2017)

6.2.2 COTTON AUSTRALIA

Cotton Australia have a structured program identifying what the possible career opportunities are within the industry. While the career pathways are not well highlighted, the program does provide a range of resources for schools and those interested in entering the industry with excursions, tours and camps to promote the opportunities available in the industry and provides a clear direction on where industry specific training is available

The cotton industry also have a program called Cotton Gap, which is a unique opportunity for cotton growers to reach keen operational staff who have just finished school and are interested in either a long-term career in cotton or 12 months employment in the form of a 'gap year'.

The Cotton Gap program (<https://cottonaustralia.com.au/work-in-cotton/cotton-careers>) provides the opportunity to work in unique rural and remote regions of Australia in mixed and varied farming enterprises. The program is promoted to potential applicants by highlighting the benefits to:

- Learn new skills
- Form new friendships
- Experience living in rural and regional Australia
- Build savings
- Undergo training to set you up for further work opportunities

- Create a network in the industry to help pursue a career in agriculture
- Participate with your friends
- Work in an exciting and innovative industry
- Gain practical experience on farm
- Build character
- Get involved in the local community and sport

6.2.3 OTHER INDUSTRY EXAMPLES

INDUSTRY	SUMMARY	LINK
Grains	<p>The grains industry in the eastern states of Australia doesn't have a clear pathway for career progression. The Grains Research and Development Corporation (GRDC) provides a brief snapshot on the careers that are potentially available, but no information on career progression or pathways.</p> <p>The Western Australian program, Careers in Grain, provides a comprehensive overview of the various career opportunities in the grains industry, and some simplified linear career pathways of how to get to a desired job.</p>	http://careersingrain.org.au/opportunities/career-pathways
Forestry	For Education and Engagement, the Forestry Industry is a good example of what can be achieved with resources for early years right through to university, as well as an international program. They have a great newsletter keeping people informed of what the industry is doing and what resources are available. They also offer camps and programs to attract students to the industry.	http://www.forest-education.com/our-programs/exploring-career-pathways/
Horticulture	Rural skills Australia, although not an individual industry does explain career pathways across the agricultural sector in general and for specific industries, however the pathways are not clear and the information provided for each industry is more statistical than engaging for potential industry workers.	http://www.ruralskills.com.au/
	The Queensland Agriculture Workforce Network (QAWN) provides information on the various job streams in horticulture more broadly and information on what's involved the various horticultural careers.	https://www.growcom.com.au/uploads/QAWN/QAWN-Production-Horticulture-Job-Streams.pdf

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