# 22650VIC
# Diploma of Applied Horticultural Science

**Version 1 October 2023**

**This course has been accredited under Part 4.4 of the *Education and Training Reform Act 2006.***

**Accredited for the period: 1 May 2024 to 30 April 2029**

VICTORIA State Government | Jobs, Skills, Industry and Regions

| Version History: | | Date |
|---|---|---|
| Version 1.0 | Initial accreditation | 1 May 2024 |



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## Section A – Copyright and course classification information

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| **1. Copyright owner of the course** | Copyright of this material is reserved to the Crown in the right of the State of Victoria on behalf of the Department of Jobs, Skills, Industries and Regions (DJSIR) Victoria.<br>© State of Victoria (Department of Jobs, Skills, Industry and Regions) 2024 |
| **2. Address** | Executive Director<br>Higher Education and Workforce<br>Skills and Employment<br>Department of Jobs, Skills, Industry and Regions (DJSIR)<br>GPO Box 4509<br>MELBOURNE VIC 3001<br><br>**Organisational Contact**<br>Manager, Training and Learning Products Unit<br>Higher Education and Workforce<br>Skills and Employment<br>Department of Jobs, Skills, Industry and Regions (DJSIR)<br>Telephone: 131823<br>Email: course.enquiry@djsir.vic.gov.au<br><br>**Day-to-day contact**<br>Curriculum Maintenance Manager (CMM)<br>Primary Industries<br>Melbourne Polytechnic<br>77-91 St Georges Rd, Preston, VIC 3072<br>Email: annewiltshire@melbournepolytechnic.edu.au<br>Telephone: (03) 9269 1063<br>Mobile: 0438 322 376 |
| **3. Type of submission** | This submission is for re-accreditation of 22514VIC Diploma of Applied Horticultural Science |
| **4. Copyright acknowledgement** | The following units of competency:<br><br>• AHCBUS518 Prepare and monitor budgets and financial reports<br>• AHCPCM404 Recommend plants and cultural practices<br>• AHCPCM507 Diagnose plant health problems<br>• AHCPCM509 Apply knowledge of plant physiology to horticultural practices<br>• AHCPCM512 Design specialised landscape<br>• AHCPGD507 Manage plant cultural practices |

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| | • AHCWRK409 Supervise work routines and staff performance<br>• AHCWRK513 Write and present reports<br>• AHCWRK516 Implement professional practice<br>have been imported from the AHC Agriculture, Horticulture and Conservation and Land Management Training Package administered by the Commonwealth of Australia.<br>© Commonwealth of Australia<br><br>The following unit of competency:<br><br>• BSBPMG430 Undertake project work<br>has been imported from the BSB Business Services Training Package administered by the Commonwealth of Australia<br>© Commonwealth of Australia |
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| **6. Course accrediting body** | Victorian Registration and Qualifications Authority |

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| **7. AVETMISS information** | **ANZSCO code – 6 digit**<br>362211 Gardener (general)<br>**ASCED Code – 4 digit**<br>0503 Horticulture and viticulture<br>**National course code**<br>22650VIC |
| **8. Period of accreditation** | 01/05/2024 to 30/04/2029 |

## Section B – Course information

| 1. Nomenclature | Standard 4.1 and 5.8 AQTF 2021 Standards for Accredited Courses |
|---|---|
| 1.1 Name of the qualification | Diploma of Applied Horticultural Science |
| 1.2 Nominal duration of the course | 1360- 1470 nominal hours |
| **2. Vocational or educational outcomes** | **Standard 5.1 AQTF 2021 Standards for Accredited Courses** |
| 2.1 Outcome(s) of the course | The course is intended to provide participants with the following vocational outcomes:<br>• Work in horticulture related technical roles in a range of organisations and government bodies.<br>• Engage in work tasks to meet current and emerging environmental challenges in horticulture using the application of plant science, sustainable work practices and technology.<br>The course is intended to provide participants with the following education outcomes:<br>• Knowledge of plant diversity classification, botany and physiology, and soil science to support progression to related specialist and higher education courses.<br>• Ability to identify and use information and decision-making processes required to problem solve in application to horticultural practices.<br>• Knowledge of current and emerging sustainability issues and practices for application in horticulture. |
| 2.2 Course description | This qualification provides the technical skills and knowledge for job roles in applied plant science within the horticulture industry. This course also provides a potential pathway into tertiary studies in horticulture or related fields. Job roles may include Curator of Gardens, Lead Horticulturalist, Horticultural Technical Officer and Horticultural Research Assistant. |
| **3. Development of the course** | **Standards 4.1, 5.1, 5.2, 5.3 and 5.4 AQTF 2021 Standards for Accredited Courses** |
| | |
| 3.1 Industry, education, legislative, enterprise or | **Industry**<br>The Victorian horticulture industry is diverse and plays a vital role in ensuring Victoria remains both liveable and resilient[1]. The Victorian nursery and garden industry includes growing on (of plants), turf, cut flowers and medicinal cannabis |

[1] Nursery & Garden Industry Victoria (NGIV). (2022, August 29). *Beautiful display garden signifies a week-long celebration of Horticulture at Parliament House*. Retrieved from Nursery & Garden Industry Victoria (NGIV): https://shorturl.at/aHIY8

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| **community needs** | producers, as well as allied businesses.<br>According to the RM Consulting Group industry report *Realisation of growth opportunities within the Victorian nursery and garden industry*[2] commissioned by Nursery and Garden Industry Victoria (NGIV), the peak industry body for the state's horticultural sector, the output of the Victorian nursery and garden industry, is estimated to be $2.5 billion with a total employment of 24,100 workers (2020/21).<br>The report supports concerns from local horticultural industry stakeholders about the need to respond to emerging challenges from a changing climate via a skilled workforce. Key findings of the report include the need for action on climate change and improved liveability of built environments in addition to the need for investment in education and training.<br>Meeting these current and emerging challenges in horticulture requires higher level technical skills and knowledge in *plantsmanship* with foundations in climate adaption to enable horticulturalists to remain competitive and have the capability to plan ahead for long term viability of the highly significant horticultural assets for which Australia is renowned. *Plantsmanship* is a word used in the industry to describe a skilled horticulturalist with expertise in plant diversity and cultivation, as well as a good understanding of other aspects of horticulture and applied plant science. The development of plantsmanship was a focus of the previous reaccreditations of the *Diploma of Applied Horticultural Science*.<br>Industry members from the current and previous Diploma of Applied Horticultural Science Project Steering Committees reported that employers have difficulty filling horticultural positions with skilled staff who have higher levels of plant science knowledge. Applicants with skills and experience in horticultural practices, often through the traineeship route, do not have the scientific depth of knowledge for solving more complex issues or a deeper understanding of plant taxonomy required to develop and implement plans and solutions.<br>This course provides a generalist horticulture diploma focusing on *plantsmanship* and technical skills for higher level technical roles in horticulture. Further to this, the focus on plantsmanship also makes this course suitable as a pathway to the study of plant biology, botany and related fields in higher education.<br>**Course background**<br>The reaccreditation of the *Diploma of Applied Horticultural Science* is the third for a course originally developed in 2007 in response to skills gaps in the RTF03 Amenity Horticulture Training Package identified by the Industry Training Board in Victoria, Primary Skills Victoria (now Food & Primary Skills Victoria) and other stakeholders.<br>The Primary Industries Curriculum Maintenance Manager (PICMM) service conducted consultation with the course provider (Melbourne Polytechnic), key industry groups and horticulture teacher network members for each reaccreditation and mid-cycle review of previous iterations of the current diploma. Skills and knowledge survey outcomes from each of the reviewed courses have validated course priorities. Despite a number of changes to the national training package qualifications in horticulture that coexisted with the Victorian course since 2007, a number of the skills gaps first identified in RTF03 remain. At the time of |

[2] RM Consulting Group. (2022). *Realisation of growth opportunities within the Victorian nursery and garden industry*. Melbourne: Nursery and Garden industry Victoria and Agricultrure Victoria, (pgs 1&2).

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| | reaccreditation, 22514VIC *Diploma of Applied Horticultural Science* is the only current generalist horticulture qualification accredited at diploma level.<br>**Target group**<br>The target group includes graduates of Certificate level III and IV VET qualifications in horticulture, VCE graduates, post-secondary career changers and horticultural workers seeking to further their skills, knowledge and career options in the horticulture industry.<br>**Past demand**<br>The *Diploma of Applied Horticultural Science* (first accredited as the *Diploma of Ornamental Horticulture*) attracted consistent enrolments over many years with one provider. This course was supported by local industry as evidenced by industry participation in the development of, and support for, previous iterations of the course. Victorian enrolment data for *22260VIC Diploma of Applied Horticultural Science*, averaged approximately 50 enrolments each year across the 2015 – 2019 period for one provider.<br>A delay in the 2018 reaccreditation of the course prior to 22514VIC (*22260VIC Diploma of Applied Horticultural Science*) resulted in a break of several months in the accreditation periods between the two courses in 2019. This break and the availability of an alternative national horticulture qualification at diploma level meant that 22514VIC was not added to the scope of any provider across its accreditation period.<br>In January 2023, the national horticulture diploma was superseded with a specialist horticulture management diploma, unsuitable to service local industry needs and learner demand due to the management specialisation and reduction in the range of higher horticultural technical skills included in the qualification under the packaging rules. This provided a rationale for the reaccreditation of the Victorian course as an option for providers of training in horticulture at diploma level. NCVER data indicates a consistent enrolment in the national horticulture diploma (now superseded) of around 200 students in Victoria between 2018 and 2022.<br>**Course consultation and validation process**<br>*22650VIC Diploma of Applied Horticultural Science* was developed under the guidance of a project steering committee (PSC) comprised of representatives from industry and former course provider.<br>The process included:<br>• steering committee meetings to discuss industry requirements of graduates for current horticulture job roles, course content and structure, and the skills and knowledge survey for wider industry distribution<br>• development of a skills and knowledge profile for job outcomes in horticulture at the diploma level to underpin a skills and knowledge survey tool to use for the review and validation the core skills required for employment in the industry<br>• distribution of the skills and knowledge survey to selected key industry contacts through the PSC members and more broadly to horticulture teacher network members in Victoria<br>• analysis of the industry skills and knowledge survey to identify skills gaps and emerging skill needs |

- consideration of current training packages units to include in the core and elective banks in the course structure
- a review of all course VU units for currency and skills needs
- additional consultation with individual PSC members via email, telephone, online forms, video communication platform to review for feedback on circulated drafts of course documents.

The skills and knowledge survey was conducted in May 2023 online. The survey response rate was low with 19 responses (about 10% of distribution), however the survey findings gave the PSC direction in determining which competencies should be included in the course and where in the course structure. Survey feedback identified the following key areas of skills and knowledge as critical to very important in relation to plantsmanship and horticultural practice:

- plant identification
- plant physiology
- soils and soil amelioration
- plant selection
- plant based environmental management
- sustainable use of water, energy and resources.

**Members of the steering committee were:**

| | | |
|---|---|---|
| David | Reid | Peak Body Industry Expert - Policy and Technical Manager, Nursery and Garde Industry Victoria |
| John | Fordham | Industry Expert - Arborist Consultant |
| Kirsten | Raynor | Industry Expert - Honorary Fellow, University of Melbourne and Horticultur and Arborist Consultant |
| Michael | Hirst | Education Expert - Horticulture Teache Melbourne Polytechnic |
| Natalie | Simmons | Industry Expert - Horticulturist Melbourr Grammar School and 22260VIC course graduate |
| Paul | Grimes | Industry Expert - Hume City Council (Chair) |
| Trent | Loane | Industry Expert - Horticulture Team Leader, Royal Botanic Gardens, Cranbourne and 22260VIC course graduate |
| **Project developers** | | |
| Anne | Wiltshire | Primary Industries Curriculum Maintenance Manager, Melbourne Polytechnic |
| Belinda | Watson-Noblet | Course writer, |

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| | | | Primary Industries Curriculum Maintenance Manager Project Officer, Melbourne Polytechnic |

This course:

- does not duplicate, by title or coverage, the outcomes of an endorsed training package qualification
- is not a subset of a single training package qualification that could be recognised through one or more statements of attainment or a skill set
- does not include units of competency additional to those in a training package qualification that could be recognised through statements of attainment in addition to the qualification
- does not comprise units that duplicate units of competency of a training package qualification.

### 3.2 Review for re-accreditation

This review of the *22514VIC Diploma of Applied Horticultural Science* was based on consultation and validation processes to ensure that the course is relevant to, and reflective of, industry work practices for current job outcomes in horticulture.

Due to the absence of a mid-cycle review for *22514VIC Diploma of Applied Horticultural Science*, an analysis was unavailable for consideration. However recent discussions with horticulture training stakeholders emphasised the need for graduates to be skilled in the use of sustainable horticultural practices and able to respond to climatic extremes and changes. The outcomes of the skills and knowledge survey undertaken during the reaccreditation process support this view. The core unit *VU23600 Apply sustainability principles to horticultural practices* emphasises the application of the principles of sustainability to all horticultural applications.

The nine VU units included in this course have been reviewed and updated for industry currency. The key changes are due to the translation of these units into *the AQTF 2021 Standards for Accredited Courses* unit template.

There are no changes to the course structure or units included in the core other than the replacement of *VU22735 Apply knowledge of plant physiology to horticultural practices* with the unit *AHCPCM509 Apply knowledge of plant physiology to horticultural practices* which duplicates the VU unit outcomes.

All superseded imported training package units have been replaced with their updated versions. No new elective units have been added or removed from the course structure.

**Equivalence**

The course *22650VIC Diploma of Applied Horticultural Science* supersedes but is not equivalent to *22514VIC Diploma of Applied Horticultural Science*. Unit equivalence is mapped in Table 1 over page.

**Table 1** – Unit equivalence. Table compares the equivalence of VU and imported units from *22514VIC Diploma of Applied Horticultural Science* with 22650VIC *Diploma of Applied Horticultural*

*Science*

| 22650VIC Diploma of Applied Horticultural Science units | 22514VIC Diploma of Applied Horticultural Science units | Relationship |
|---|---|---|
| VU23597 Apply the science of botany to plant identification | VU22734 Apply the science of botany to plant identification | Equivalent |
| VU23598 Manage soils and growing media | VU22738 Manage soils and growing media to enhance sustainability | Not equivalent |
| VU23599 Select plants for a range of horticultural applications | VU22736 Select plants for use in sustainable horticulture | Not equivalent |
| VU23600 Apply sustainability principles to horticultural practices | VU22737 Apply sustainable horticultural practices | Not equivalent |
| VU23601 Develop and implement a pruning program | VU22739 Develop and implement a pruning program | Equivalent |
| VU23602 Develop and implement a propagation program | VU22740 Develop and implement a propagation program | Not equivalent |
| VU23603 Manage the care and maintenance of trees | VU22741 Manage the care and maintenance of trees | Equivalent |
| VU23604 Plan, establish and maintain lawns | VU22742 Plan, establish and maintain lawns and lawn alternatives | Equivalent |
| VU23605 Use and apply geographical information system (GIS) technology | VU22743 Select, use and apply geographical information system (GIS) technology | Not equivalent |
| AHCBUS518 Prepare and monitor budgets and financial reports | AHCBUS508 Prepare and monitor budgets and financial reports | Equivalent |
| AHCPCM404 Recommend plants and cultural practices | AHCPCM401 Recommend plants and cultural practices | Not equivalent |
| AHCPCM507 Diagnose plant health problems | AHCPCM501 Diagnose plant health problems | Not equivalent |
| AHCPCM509 Apply knowledge of plant physiology to horticultural practices | VU22735 Apply knowledge of plant physiology to horticultural practices | Newly imported to replace VU22735 |

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| | AHCPCM512 Design specialised landscape | AHCPCM504 Design specialised landscape | Equivalent |
| | AHCPGD507 Manage plant cultural practices | AHCPGD501 Manage plant cultural practices | Equivalent |
| | AHCWRK409 Supervise work routines and staff performance | AHCWRK403 Supervise work routines and staff performance | Not equivalent |
| | AHCWRK513 Write and present reports | AHCWRK503 Prepare reports | Equivalent |
| | AHCWRK516 Implement professional practice | AHCWRK507 Implement professional practice | Not equivalent |
| | BSBPMG430 Undertake project work | BSBPMG522 Undertake project work | Equivalent |

| 4. Course outcomes | Standards 5.5, 5.6 and 5.7 AQTF 2021 Standards for Accredited Courses |
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| **4.1 Qualification level** | Under the Australian Qualifications Framework Second Edition, January 2013, Diploma level qualifies individuals to apply a broad range of skills and knowledge in varied contexts and provides a pathway to further learning.<br>This course is consistent with the criteria and specifications of the AQF Level 5 Criteria. Individuals apply integrated technical and theoretical concepts in a broad range of contexts to undertake advanced skilled work and as a pathway for further learning such as a Horticultural Curator who has the responsibility to maintain a specific plant collection, using knowledge of botany, taxonomy, physiology to make plant choices.<br>**Knowledge**<br>Graduates of a Diploma will have technical and theoretical knowledge, with depth in some areas within a field of work and learning in horticulture.<br>**Skills**<br>Graduates of a Diploma will have:<br>• cognitive and communication skills to identify, analyse, synthesise and act on information from a range of sources such as identifying and surveying trees for signs of physiological limb decline, recommending and acting to address the problem<br>• cognitive, technical and communication skills to analyse, plan, design and evaluate approaches to unpredictable problems and/or management requirements such as with the development and implementation of a tree maintenance plan for particular species following a disease outbreak within a heritage garden |

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| | • specialist technical and creative skills to express ideas and perspectives such as selecting plants for a garden landscape designed for minimal water use and low maintenance costs<br>• communication skills to transfer knowledge and specialised skills to others such as changing horticultural practices to meet climate challenges, and developing and undertaking a sustainability audit for maintaining a garden.<br>**Application of knowledge and skills**<br>Graduates of a Diploma will demonstrate the application of knowledge and skills:<br>• with depth in some areas of specialisation, in known or changing contexts such as using technology to map, record, and store data, then interpret the data to monitor changes in vegetation over time<br>• to transfer and apply theoretical concepts and/or technical and/or creative skills in a range of situations by using botanical and taxonomic knowledge to recommend plants for difficult sites or limited resources<br>• use personal responsibility and autonomy in performing complex technical operations with responsibility for own outputs in relation to broad parameters for quantity and quality such as improving the health of soil through investigation of soil conditions, planning and implementing a soil improvement strategy.<br>**Volume of learning**<br>The volume of learning for the Diploma of Applied Horticultural Science is 1-2 years. It incorporates structured training delivery and unstructured learning activities.<br>Structured training including:<br>• classroom, blended and on-line delivery<br>• supervised practical activities.<br>Unstructured learning activities that may include:<br>• self-directed study, research, project work, written assignments and research activities into plants and horticultural practices<br>• application of skills practice<br>• work experience and/or industry-based learning. |
| **4.2 Foundation skills** | Foundation skills applicable to the outcomes of this course are identified in the units of competency. |
| **4.3 Recognition given to the course (if applicable)** | N/A |
| **4.4 Licensing/regulatory requirements (if applicable)** | N/A |

| 5. Course rules | Standards 5.8 and 5.9 AQTF 2021 Standards for Accredited Courses |
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| **5.1 Course structure** | To achieve the award of *22650VIC Diploma of Applied Horticultural Science* the learner must successfully complete a total of 15 units comprising:<br>• 10 core units<br>• 5 elective units.<br>Elective units may be selected from the list below or from units first packaged at an AQF level 4 or 5 in any other accredited course or endorsed training package qualification. Electives selected must be consistent with the vocational outcomes of this qualification and should not duplicate the outcomes of core units.<br>Where the full qualification is not completed, a VET Statement of Attainment will be issued for each unit successfully completed. |

| Unit of competency code | Unit of competency title | Field of Education code (six-digit) | Pre-requisite | Nominal hours |
|---|---|---|---|---|
| **Core units (10)** | | | | |
| VU23597 | Apply the science of botany to plant identification | 050301 | Nil | 60 |
| VU23598 | Manage soils and growing media | 050301 | Nil | 100 |
| VU23599 | Select plants for a range of horticultural applications | 050301 | Nil | 100 |
| VU23600 | Apply sustainability principles to horticultural practices | 050301 | Nil | 70 |
| AHCPCM507 | Diagnose plant health problems | 050301 | Nil | 120 |
| AHCPCM509 | Apply knowledge of plant physiology to horticultural practices | 050301 | Nil | 100 |
| AHCPCM512 | Design specialised landscape | 040105 | Nil | 150 |
| AHCPGD507 | Manage plant cultural practices | 050301 | Nil | 200 |
| AHCWRK513 | Write and present reports | 100705 | Nil | 60 |
| AHCWRK516 | Implement professional practice | 080305 | Nil | 100 |
| | | | Subtotal | **1060** |

| Elective units (5) | | | | |
|---|---|---|---|---|
| VU23601 | Develop and implement a pruning program | 050301 | Nil | 60 |
| VU23602 | Develop and implement a propagation program | 050301 | Nil | 60 |
| VU23603 | Manage the care and maintenance of trees | 050301 | Nil | 60 |
| VU23604 | Plan, establish and maintain lawns | 050301 | Nil | 60 |
| VU23605 | Use and apply geographical information system (GIS) technology | 020399 | Nil | 60 |
| AHCBUS518 | Prepare and monitor budgets and financial reports | 080101 | Nil | 140 |
| AHCPCM404 | Recommend plants and cultural practices | 050301 | Nil | 80 |
| AHCWRK409 | Supervise work routines and staff performance | 080303 | Nil | 70 |
| BSBPMG430 | Undertake project work | 080315 | Nil | 60 |
| | | | **Total nominal hours** | **1360 - 1470** |

| | Standard 5.11 AQTF 2021 Standards for Accredited Courses |
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| **5.2 Entry requirements** | There are no entry requirements for the Diploma of Applied Horticultural Science.<br>The following is a general guide to entry in relation to the language, literacy and numeracy skills of learners aligned to the Australian Core Skills Framework (ACSF), details of which can be accessed at Department of Employment and Workplace Relations.<br>Learners are best equipped to achieve the course outcomes in the Diploma of Applied Horticultural Science if they have language, literacy and numeracy skills that are equivalent to Level 4 of the ACSF.<br>Learners with language, literacy and numeracy skills at ACSF level 3 or lower may require additional support to successfully undertake the qualification. |

| 6. Assessment | Standard 5.12 and 5.14 AQTF 2021 Standards for Accredited Courses |
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| **6.1 Assessment strategy** | All assessment, including Recognition of Prior Learning (RPL), must be compliant with the requirements of:<br>• Standard 1 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guidelines 4.1 and 4.2 of the VRQA Guidelines for VET Providers,<br>or<br>• the Standards for Registered Training Organisations 2015 (SRTOs),<br>or<br>• the relevant standards and Guidelines for RTOs at the time of assessment.<br>Assessment strategies for the course should:<br>• be grounded in a relevant context and not be culturally biased<br>• utilise a variety of different processes/sources, such as written, oral, observation, projects appropriate to assess knowledge and performance<br>• comprise a clear statement of both the criteria and assessment process<br>• use assessment tools to suit the needs of learners<br>• gather sufficient evidence to judge achievement of progress towards determining competence<br>• recognise achievement of elements/competencies regardless of where the enabling learning took place<br>• foster a collaborative and co-operative relationship between the learner and assessor<br>• be flexible in regard to the range and type of evidence provided by the learner<br>• allow a reasonable period of time to complete a task and allow for preparation and re-drafting as appropriate to the task<br>• provide opportunity for the learner to challenge assessment provisions and participate in reassessment<br>• not unnecessarily restrict the progress of a learner through the course<br>• be equitable and fair to all learners.<br>Assessment methods may include:<br>• oral and/or written questioning and quizzes<br>• observation of performance<br>• portfolio of evidence such as documentation of plant identification activities<br>• practical demonstration of required physical tasks<br>• oral and written reports on project work |

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| | • investigative research and case study analysis.<br><br>A combination of assessment of more than one unit may be used to reflect working practice for projects in the workplace or simulated workplace.<br><br>**Imported units**<br>Assessment of units of competency imported from training packages or accredited courses must be consistent with the assessment requirements specified in those training products. |
| **6.2 Assessor competencies** | Assessment must be undertaken by a person or persons in accordance with:<br><br>• Standard 1.4 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guidelines 3 of the VRQA Guidelines for VET Providers,<br><br>or<br><br>• the Standards for Registered Training Organisations 2015 (SRTOs),<br><br>or<br><br>• the relevant standards and Guidelines for RTOs at the time of assessment.<br><br>Assessment of units of competency from nationally endorsed training packages and units imported from accredited courses must comply with the assessor requirements detailed in the source training product. |

| **7. Delivery** | **Standards 5.12, 5.13 and 5.14 AQTF 2021 Standards for Accredited Courses** |
|---|---|
| **7.1 Delivery modes** | This qualification may be delivered full-time or part-time in a variety of modes, including via:<br><br>• Face-to-face and online classes<br>• Workplace or simulated workplace<br>• Practical work<br>• Self-paced learning and case studies<br>• Blended learning or flexible delivery.<br><br>Delivery methods should allow for contextualisation of the qualification in response to learner needs, while still meeting the requirements of the units of competency.<br><br>Delivery strategies should actively involve the learner and learning should be experiential, relevant and age appropriate. Providers should be flexible in the way the training is delivered to ensure they meet the needs of the client group.<br><br>The use of workplace-based horticulture projects is encouraged as a form of learning benefiting both learner and host organisation.<br><br>A holistic approach to delivery may be achieved by combining the delivery of more than one unit to replicate industry practice. |

| 7.2 Resources | **Essential facilities and equipment**<br>Participants must have access to:<br>• an appropriate horticulture workplace or an environment that reproduces normal work conditions in a commercial horticultural industry setting<br>• a wide range of plants used in the amenity horticulture industry<br>• equipment, tools and machinery normally used in a horticulture workplace such as secateurs, pruners, handsaws, hedge trimmers, steps, chippers and mulchers<br>• research and reference resources used for the identification and cultural requirements of plants, relevant horticultural practices, sustainability and emerging issues for horticulture linked to climate change.<br>Access is also required to a classroom, teaching laboratory suitable for plant and soil practical work, library, computer and audio-visual equipment.<br>Training must be undertaken by a person or persons in accordance with:<br>• Standard 1.4 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guideline 3 of the VRQA Guidelines for VET Providers,<br>OR<br>• the Standards for Registered Training Organisations 2015 (SRTOs),<br>OR<br>• the relevant standards and Guidelines for RTOs at the time of assessment.<br>The units of competency imported from training packages or accredited courses must reflect the requirements for resources/trainers specified in that training package or accredited course. |
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| 8. Pathways and articulation | Standard 5.10 AQTF 2021 Standards for Accredited Courses |
|---|---|
| | There are no formal articulation arrangements in place at the time of accreditation. The course may enable individuals to enter further education with a horticulture focus. Examples of further training include:<br>• Associate Degree in Environmental Horticulture<br>• Bachelor of Horticulture<br>• Graduate Certificate in Urban Horticulture.<br>Learners who complete units of competency from endorsed training packages or accredited course will be eligible for credit into other qualifications that contain those units. |

| 9. Ongoing monitoring and evaluation | Standard 5.15 AQTF 2021 Standards for Accredited Courses |
|---|---|
| | Ongoing monitoring and evaluation of the course is the responsibility of the Primary Industries Curriculum Maintenance Manager (PICMM). PICMM will ensure that the content remains relevant and that teaching strategies are appropriate to the content.<br><br>A formal review will take place once during the period of accreditation and will be informed by feedback from users of the course and will consider at a minimum:<br><br>• any changes required to meet emerging or developing needs<br>• changes to any units of competency from nationally endorsed training packages or accredited courses.<br><br>Any significant changes to the courses will be notified to the VRQA. |

## Section C – Units of competency

Units of competency imported from training packages.

The following units of competency can be accessed from training.gov.au
AHCBUS518 Prepare and monitor budgets and financial reports
AHCPCM404 Recommend plants and cultural practices
AHCPCM507 Diagnose plant health problems
AHCPCM509 Apply knowledge of plant physiology to horticultural practices
AHCPCM512 Design specialised landscape
AHCPGD507 Manage plant cultural practices
AHCWRK409 Supervise work routines and staff performance
AHCWRK513 Write and present reports
AHCWRK516 Implement professional practice
BSBPMG430 Undertake project work

The following units of competency developed for this course are contained in Section C:
VU23597 Apply the science of botany to plant identification
VU23598 Manage soils and growing media
VU23599 Select plants for a range of horticultural applications
VU23600 Apply sustainability principles to horticultural practices
VU23601 Develop and implement a pruning program
VU23602 Develop and implement a propagation program
VU23603 Manage the care and maintenance of trees
VU23604 Plan, establish and maintain lawns
VU23605 Use and apply geographical information system (GIS) technology

| | |
|---|---|
| **Unit code** | **VU23597** |
| **Unit title** | **Apply the science of botany to plant identification** |
| **Application** | This unit describes the performance outcomes, skills and knowledge required to apply the science of botany to identify plants.<br>It requires the ability to apply botanical terminology to recognise and describe the morphological features of plants for use in the taxonomic classification, identification and nomenclature of plants.<br>This unit applies to learners working in all sectors of the horticulture industry who apply specialised skills and knowledge to use botanical features to identify plant species.<br>No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication. |
| **Pre-requisite Unit(s)** | N/A |
| **Competency Field** | N/A |
| **Unit Sector** | N/A |

| **Element** | | **Performance Criteria** | |
|---|---|---|---|
| Elements describe the essential outcomes of a unit of competency. | | Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the assessment requirements. | |
| | | | |
| 1 | Research plant taxonomy | 1.1 | Research plant taxonomy to categorise plants into taxonomic levels including plant kingdom divisions, major plant families, genera and species |
| | | 1.2 | Research and identify plant morphological features and other characteristics used in the taxonomic classification of plants |
| | | 1.3 | Use botanical terminology to describe plant morphological features used in the classification of plants to taxonomic levels |
| | | 1.4 | Use morphological and other characteristics to classify plants according to taxonomic levels |
| | | 1.5 | Research and use the rules of plant nomenclature to apply names to plants |
| 2 | Use botanical methodology to identify plant species | 2.1 | Research, locate and select plant keys and/or other authoritative botanical references or resources to use for the identification of plants |

| | | | |
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| | | 2.2 | Access plant specimen material and document detailed morphological features and other plant characteristics to enable the use of plant keys to identify plants to species level |
| | | 2.3 | Use plant keys and other references and resources to identify live or preserved plant specimens to species level |
| | | 2.4 | Use published plant descriptions and resources to verify plants identified using plant keys |

## Range of Conditions

N/A

## Foundation Skills

| Skill | Description |
|---|---|
| Numeracy skills to: | estimate and measure the dimensions of plant morphological features used for identification |
| Problem-solving skills to: | use alternative methods or combinations of methods where seasonal morphological features may be absent or unavailable |
| Technology skills to: | use computers, digital devices, software programs, and apps to access online information from botanical databases |
| Digital literacy skills to: | use computers, digital devices, software programs, and apps to research botanical information to classify, identify and verify plants |

| Unit Mapping Information | | | |
|---|---|---|---|
| | Code and Title Current Version | Code and Title Previous Version | Comments |
| | VU23597 Apply the science of botany to plant identification | VU22734 Apply the science of botany to plant identification | Equivalent |

| Assessment Requirements Template | |
|---|---|
| **Title** | Assessment Requirements for VU23597 Apply the science of botany to plant identification |
| **Performance Evidence** | There must be evidence the learner has completed the tasks outlined in the elements and performance criteria of this unit. There must be evidence the leaner has for at least three plant species, identified the plant to species level and for each plant species has:<br>• used botanical terminology to describe morphological features of external plant structures and other characteristics of the plant to use for identification<br>• classified the plant according to taxonomic levels<br>• keyed out plant to species level using one or more authoritive plant identification keys<br>• documented identification methodology, authoritative references, plant key(s), plant key sequence, scientific plant name, common plant name, and resources used for the classification and identification of plant to species level. |
| **Knowledge Evidence** | The learner must be able to demonstrate essential knowledge required to effectively do the tasks outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of:<br>• plant taxonomy including:<br>  ○ taxonomic levels, non-vascular plants and vascular plants, pterophytes, gymnosperms, angiosperms, monocotyledons, basal dicotyledons, and eudicotyledons<br>  ○ the classification of plants into different categories, as cited in the relevant International Codes of Nomenclature, including class, subclass, order, family, sub family, tribe, sub-tribe, genus, species, variety, form and subspecies<br>• major plant families common to horticulture<br>• plant morphology including:<br>  ○ leaf characteristics including leaf surfaces, shapes and margins and their attachments and arrangements; stems and their characteristics<br>  ○ reproductive structures from development to maturity<br>  ○ specialisations and modifications of leaves, stems, roots and reproductive structures<br>• sources of authoritative references and resources used in the classification, identification, verification of plants including the use of herbarium specimens |

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| | • types and use of plant keys as tools for the classification and identification of plants to species level utilising visible plant morphological characteristics<br>• botanical terminology used for botanical descriptions, and methodology for keying out sequencing and other referencing<br>• botanical nomenclature, plant names and the conventions for writing them as governed by the relevant International Codes of Nomenclature. |
| **Assessment Conditions** | Assessment of the skills in this unit of competency must take place under the following conditions:<br>• a workplace setting or an environment that accurately represents workplace conditions and access to:<br>  ○ live plant material from a wide range of plants from varied horticultural settings<br>  ○ hand lens, dissection microscope and equipment for examining plants<br>  ○ personal protective workwear and equipment for handling plant material<br>  ○ computer/device for accessing online resources and using relevant software programs and digital applications<br>  ○ authoritative references, plant keys and resources for identification, international codes and online resources relevant to applying knowledge of plant botany<br>  ○ botanical and biological references and publications relevant to plant identification and verification.<br>Assessor requirements<br>No specialist vocational competency requirements for assessors apply to this unit. |

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|---|---|
| **Unit code** | **VU23598** |
| **Unit title** | **Manage soils and growing media** |
| **Application** | This unit describes the performance outcomes, skills and knowledge required to describe and assess soil and growing media characteristics and environmental conditions, and horticultural practices that affect soil and growing media management.<br>It requires the ability to identify, implement and review horticultural practices to achieve and maintain healthy soils and growing media.<br>This unit applies to learners working in all sectors of the horticulture industry who apply specialised skills and knowledge to plan, develop, implement and review a soil and growing media management plan to improve and maintain soil and growing media characteristics.<br>No occupational licensing, legislative or certification requirements apply to this unit at the time of publication. |
| **Pre-requisite Unit(s)** | N/A |
| **Competency Field** | N/A |
| **Unit Sector** | N/A |

| **Element** | | **Performance Criteria** | |
|---|---|---|---|
| Elements describe the essential outcomes of a unit of competency. | | Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the assessment requirements. | |
| | | | |
| 1 | Research characteristics of soils and growing media | 1.1 | Identify the characteristics of natural soils, urban soils, and other growing media and their associated applications and limitations |
| | | 1.2 | Conduct and analyse site assessment to establish soil characteristics and site conditions |
| | | 1.3 | Review growing media specifications to establish growing media characteristics and conditions |
| | | 1.4 | Examine the role of biota in soil and growing media and their effect on soil and growing media function and plant health |
| | | 1.5 | Evaluate current and historical landscape management practices to determine possible onsite soil problems and challenges |

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| | | 1.6 | Evaluate growing media management practices to determine possible problems and challenges |
| 2 | Develop a management plan to improve and maintain soil or growing media health<br>. | 2.1 | Perform initial onsite soil or growing media tests and interpret results |
| | | 2.2 | Sample soil or growing media for further site and laboratory testing and interpret results |
| | | 2.3 | Record onsite and laboratory testing results in accordance with workplace policies and procedures |
| | | 2.4 | Determine inputs and methods required to improve and maintain soil or growing media condition |
| | | 2.5 | Determine strategies to minimise soil erosion or growing media degradation |
| | | 2.6 | Assess and document the environmental implications of chemical use on soil or growing media |
| | | 2.7 | Determine key performance indicators to establish the success of the plan |
| | | 2.8 | Develop a plan to maintain or improve the soil or growing media health |
| 3 | Implement management plan for improvement and maintenance of healthy soil or growing media | 3.1 | Develop a work schedule for the soil or growing media management plan |
| | | 3.2 | Determine key staff responsibilities for specific implementation processes, and allocate duties |
| | | 3.3 | Modify work schedule to meet contingencies, and communicate to staff |
| | | 3.4 | Record and document soil or growing media amelioration activities according to workplace procedures |
| 4 | Review soil or growing media management plan | 4.1 | Evaluate the effectiveness of the soil or growing media management plan against key performance indicators |
| | | 4.2 | Determine necessary modifications and prepare recommendations for future work schedules |

## Range of Conditions

N/A

## Foundation Skills

| Skill | Description |
|---|---|
| Reading skills to: | interpret embedded qualitative and quantitative information to, identify and |

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| | assess soil characteristics |
| Writing skills to: | summarise and synthesis key information from soils and growing media scientific texts, journals and publications |
| Numeracy skills to: | interpret climatic values and/or data in tables, charts or graphs |
| Problem-solving skills to: | interpret and analyse scientific information to identify and assess soil and growing media health |
| Planning and organising skills to: | collect, analyse and organise soil and growing media information |
| Technology skills to: | use computers, digital devices, software programs, and apps to access soil and growing media online information |
| Digital literacy skills to: | use computers, digital devices, software programs, and apps to research scientific information on soils, land management practices, growing media and its management |

| **Unit Mapping Information** | | | |
|---|---|---|---|
| | Code and Title Current Version | Code and Title Previous Version | Comments |
| | VU23598 Manage soils and growing media | VU22738 Manage soils and growing media to enhance sustainability | Not equivalent |

| Assessment Requirements Template | |
|---|---|
| **Title** | Assessment Requirements for VU23598 Manage soils and growing media |
| **Performance Evidence** | There must be evidence the learner has completed the tasks outlined in the elements and performance criteria of this unit, and:<br>• developed at least one soil management plan for a horticultural setting<br>• developed at least one growing media (non-soil) management plan for a horticultural setting<br>and<br>• implemented and reviewed at least one of the management plans developed. The review should include:<br>  ○ the soil or growing media management plan<br>  ○ implementation work plans and outcomes in terms of soil or growing media health<br>  ○ management plan modifications recommended to improve and maintain soil or growing media health based on evaluation outcomes. |
| **Knowledge Evidence** | The learner must be able to demonstrate essential knowledge required to effectively do the tasks outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of:<br>• physical, chemical and biological properties of soils/growing media<br>• growing media types including natural soils, urban soils, constructed soil and their associated applications and limitations<br>• site assessment procedures and techniques<br>• on-site soil tests and test procedures<br>• soil and growing media sampling techniques for laboratory analysis<br>• interpretation and analysis of soil and growing media test results and/or specifications<br>• soil biota types including bacteria, fungi yeasts and moulds and soil fauna such as nematodes, protozoa, arthropods and other macroorganisms<br>• the role of biota in the function and health of soils or growing media<br>• factors affecting soil and growing media biota, including moisture, temperature, aeration, nutrient supply, pH, and organic matter<br>• plant nutrition, including:<br>  ○ essential nutrients<br>  ○ macronutrients<br>  ○ micronutrients<br>  ○ deficiencies<br>  ○ toxicities |

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| | ○ effect of pH<br>• the natural cycling of nutrients including:<br>○ carbon, nitrogen, phosphorous<br>○ the role of biota in the cycles<br>○ climatic and geographic factors<br>• land management practices affecting soil health and condition<br>• soils or growing media problems and challenges<br>• preservation methods for in-situ soils<br>• soil ameliorants and soil improvement techniques for addressing site limitations including types and functions of soil and growing media ameliorant products, increasing organic matter levels and drainage modification<br>• soil and growing media improvement and maintenance plan, including:<br>○ characteristics, properties or specifications for soil and growing media<br>○ possible health risks, problems and challenges<br>○ actions needed to improve and maintain the health of soil and growing media, including alternative methods<br>○ work schedules<br>○ key performance indicators<br>○ monitoring<br>• key performance indicators used to determine improvement and maintenance to sustain soil and growing media condition. |
| **Assessment Conditions** | Assessment of the skills in this unit of competency must take place under the following conditions:<br>• a workplace setting or an environment that accurately represents workplace conditions and access to:<br>○ a horticultural site<br>○ a range of soils and growing media<br>○ soil sampling and testing tools and equipment<br>○ testing agency requirements applicable to sampling soils<br>○ growing media specifications<br>○ soils and growing media test laboratory results<br>○ records of soil and growing media test results.<br><br>Assessor requirements<br>No specialist vocational competency requirements for assessors apply to this unit. |

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|---|---|
| **Unit code** | **VU23599** |
| **Unit title** | **Select plants for a range of horticultural applications** |
| **Application** | This unit describes the performance outcomes, skills and knowledge required to select plants for a range of horticultural applications based on environmental factors, conditions and legal requirements.<br>It requires the ability to research plant cultural requirements and apply knowledge of plant growth and development, plant taxonomy, environmental conditions, climate science and how plants adapt to climatic factors, to plant selection.<br>This unit applies to learners working in all sectors of the horticulture industry who apply specialised skills and knowledge to apply plant and environmental research to select plants for a range of sustainable horticultural applications.<br>No occupational licensing, legislative or certification requirements apply to this unit at the time of publication. |
| **Pre-requisite Unit(s)** | N/A |
| **Competency Field** | N/A |
| **Unit Sector** | N/A |

| **Element** | | **Performance Criteria** | |
|---|---|---|---|
| Elements describe the essential outcomes of a unit of competency. | | Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the assessment requirements. | |
| | | | |
| 1 | Research plants and their environment | 1.1 | Identify legislative requirements, industry standards and codes of practice, workplace policies and procedures relevant to the selection of plants and horticultural practices |
| | | 1.2 | Identify the components of the climate system and the role of the major greenhouse gases in the climate system |
| | | 1.3 | Research the potential impacts of climate change on local natural and manipulated environments in horticulture |
| | | 1.4 | Analyse the relationship between global environmental factors and the distribution of plant communities |
| | | 1.5 | Research the impact of environmental factors on plant growth and determination of the natural growing season |
| | | 1.6 | Research plant adaptations as responses to natural and |

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| | | | manipulated environments in horticulture |
| | | 1.7 | Analyse information on Australia's bioregions identifying climatic influences on Australian vegetation communities |
| | | 1.8 | Document research for reference in plant selection for a range of horticultural applications |
| 2 | Research plants used in horticulture | 2.1 | Source reference material to identify a range of plants |
| | | 2.2 | Research and describe plants to species level, using botanical names and terminology |
| | | 2.3 | Collate documentation and other information including plant adaptations, plant form, plant cultural requirements and environmental requirements for the identified plants |
| | | 2.4 | Source and examine information on plants that may present a threat to the environment |
| 3 | Select plants for different environments | 3.1 | Evaluate research to identify and document horticultural application and plant selection criteria based on environmental factors and conditions |
| | | 3.2 | Apply plant selection criteria to select plants for horticultural application |
| | | 3.3 | Research and comply with legislation applicable to horticulture when selecting plants |
| | | 3.4 | Document recommendations for plants selected and ongoing maintenance and management |

## Range of Conditions

N/A

## Foundation Skills

| Skill | Description |
|---|---|
| Reading skills to: | interpret embedded qualitative information to identify climatic factors influencing plant selection |
| Writing skills to: | summarise and synthesis key information from reference material and publications |
| Numeracy skills to: | interpret quantitative climatic information and data in tables, charts or graphs |

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| Problem-solving skills to: | analyse the reliability and validity of horticultural, climatic and other environmental information |
| Planning and organising skills to: | organise researched plant information into an accessible format for evaluation |
| Technology skills to: | use computers, digital devices, software programs, and apps to access online research activities |
| Digital literacy skills to: | use computers, digital devices, software programs and apps to search, navigate, communicate and analyse researched information for plant selection |

| **Unit Mapping Information** | | | |
|---|---|---|---|
| | Code and Title Current Version | Code and Title Previous Version | Comments |
| | VU23599 Select plants for a range of horticultural applications | VU22736 Select plants for use in sustainable horticultural practices | Not equivalent |

| Assessment Requirements Template | |
|---|---|
| **Title** | Assessment Requirements for VU23599 Select plants for a range of horticultural applications |
| **Performance Evidence** | There must be evidence the learner has completed the tasks outlined in the elements and performance criteria of this unit and:<br>• for at least 3 different Australian bioregions, described 3 effects that climate change may have on plant communities, and plant selection for horticultural applications, within each bioregion<br>• described the cultural requirements for a minimum of 250 plant species<br>• analysed factors for plant selection criteria based on environmental factors, conditions and legal requirements to select a group of plants for 3 different horticultural applications. |
| **Knowledge Evidence** | The learner must be able to demonstrate essential knowledge required to effectively do the tasks outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of:<br>• major parts of the global climate system<br>• major greenhouse gases, their role in the climate system and difference between greenhouse effect and human induced greenhouse effect<br>• global bioregions, Australian major bioregions and subregions<br>• basic principles of plant growth and development<br>• factors affecting plant growth, development, distribution, plant form and adaption including:<br>  ○ growth cycle and growing season<br>  ○ environmental conditions and cultural practices<br>  ○ climate variability and how plants within ecosystems react to climate change pressures<br>• reference material used to identify, describe, select and maintain plants<br>• plant taxonomy and nomenclature as cited in the relevant International Codes of Nomenclature<br>• plant morphology and botanical terms used to describe plants<br>• suitability of plants for different environments, including:<br>  ○ plant cultural requirements<br>  ○ establishment and maintenance requirements<br>  ○ environmental threats of plants used in horticulture<br>• plant selection criteria for horticultural applications including:<br>  ○ sustainability<br>  ○ contemporary environmental factors including changing climate |

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| | ○ amenity<br>○ aesthetic<br>○ ornamental<br>○ conservation<br>○ heritage<br>○ productive<br>○ design for sustainability<br>• relevant legal requirements, regulations and codes of practice including international, national, state and local acts and regulations<br>• industry best practice, guidelines and standards for biosecurity, biodiversity, conservation, environmental management and protection, fisheries and plant collection ethics<br>• workplace policies and procedures. |
| **Assessment Conditions** | Assessment of the skills in this unit of competency must take place under the following conditions:<br>• workplace setting or an environment that accurately represents workplace conditions and access to:<br>○ plant specimens from a broad range of plant families and horticultural settings<br>○ reference material applicable to identifying and selecting plants<br>○ computers and the internet to access information<br>○ scientific texts, taxonomic keys and botanical and biological references and publications.<br>Assessor requirements<br>No specialist vocational competency requirements for assessors apply to this unit. |

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|---|---|
| **Unit code** | **VU23600** |
| **Unit title** | **Apply sustainability principles to horticultural practices** |
| **Application** | This unit describes the performance outcomes, skills and knowledge required to apply the principles of sustainability to horticultural practices.<br><br>It requires the ability to identify the resources used in horticultural practices, apply systems-based thinking and analysis tools to assess the sustainability impacts, and recommend improvements to reduce and mitigate resource usage.<br><br>This unit applies to learners working in all sectors of the horticulture industry who apply specialised skills and knowledge to analyse and synthesise information required to design and communicate solutions for sustainable horticultural outcomes.<br><br>No occupational licensing, legislative or certification requirements apply to this unit at the time of publication. |
| **Pre-requisite Unit(s)** | N/A |
| **Competency Field** | N/A |
| **Unit Sector** | N/A |

| **Element** | | **Performance Criteria** | |
|---|---|---|---|
| Elements describe the essential outcomes of a unit of competency. | | Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the assessment requirements. | |
| | | | |
| 1 | Investigate the principles of sustainability and their application to horticultural practices | 1.1 | Research the principles of sustainability, systems-based thinking, life cycle analysis and other tools used to identify and assess sustainability impacts |
| | | 1.2 | Research and describe horticultural practices impacting environmental, economic and societal systems |
| | | 1.3 | Research and identify the legislation, standards, policies and regulations and codes that apply to horticultural practices |
| 2 | Assess the sustainability impacts of horticultural practices | 2.1 | Identify examples of resources, materials, equipment and processes used in a horticultural work setting |
| | | 2.2 | Evaluate workplace records, information and data relating to resources, materials, equipment and processes usage |

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| | | 2.3 | Use principles of sustainability to identify positive and negative gains and losses of resources, materials, equipment and processes usage in a horticultural work setting |
| | | 2.4 | Identify sustainability frameworks and techniques used to guide, analyse and assess sustainability impacts |
| | | 2.5 | Apply analysis techniques to assess the sustainability impacts of horticultural practices |
| 3 | Make recommendations to improve horticultural practice to reduce and mitigate sustainability impacts | 3.1 | Identify and document improvement strategies to reduce and mitigate resource, materials, equipment and processes usage and other impacts on sustainability in the workplace |
| | | 3.2 | Present recommended improvements to key stakeholders for feedback |
| | | 3.3 | Review feedback and respond to key stakeholder feedback |
| | | 3.4 | Incorporate agreed changes into final improvement strategies for sustainable horticultural practices |



## Range of Conditions

NA

## Foundation Skills

| Skill | Description |
|---|---|
| Reading skills to: | interpret embedded qualitative and quantitative information to recommend improvements to resource usage and horticultural practices |
| Oral communication skills to: | interact effectively with stakeholders to explain improvement strategies and procedures |
| Numeracy skills to: | identify and interpret measurements and data to perform calculations to determine resource usage<br>quantify direct, indirect and intangible aspects of sustainability impacts |
| Problem-solving skills to: | analyse the reliability of resource usage data<br>review information from a wide range of sources to determine sustainability improvements |
| Initiative and enterprise skills to: | translate research into improvement actions |
| Planning and organising skills to: | collect, analyse and organise resource usage information and data |
| Technology skills to: | use computers, digital devices, software programs, and apps to access online sustainable horticultural practice information |
| Digital literacy skills to: | use computers, digital devices, software programs, and apps to research the principles of sustainability and resource usage |

| Unit Mapping Information | | | |
|---|---|---|---|
| | Code and Title Current Version | Code and Title Previous Version | Comments |
| | VU23600 Apply sustainability principles to horticultural practices | VU22737 Apply sustainable horticultural practices | Not equivalent |

| Assessment Requirements Template | |
|---|---|
| **Title** | Assessment Requirements for VU23600 Apply sustainability principles to horticultural practices |
| **Performance Evidence** | There must be evidence the learner has completed the tasks outlined in the elements and performance criteria of this unit and for at least two horticultural practices in a horticultural setting:<br>• researched and identified the horticultural practice resource, materials, equipment and processes and relevant legislation, regulations and industry codes of practice<br>• applied the principles of sustainability to evaluate the horticultural practice in terms of sustainability and recommend improvements to reduce and mitigate impacts of the practice. |
| **Knowledge Evidence** | The learner must be able to demonstrate essential knowledge required to effectively do the tasks outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of:<br>• horticultural practices impacting sustainability including:<br>  ○ garden and landscape design<br>  ○ habitat and biodiversity protection<br>  ○ soil protection and conservation including erosion<br>  ○ soil and growing media selection and health<br>  ○ energy sourcing renewable/non-renewable and efficiency<br>  ○ chemical management<br>  ○ water management<br>  ○ waste management<br>  ○ resource usage and efficiency measures<br>  ○ procurement of sustainable products and materials<br>  ○ transport and accounting for carbon miles<br>  ○ material selection, quantity and use for sustainable impact<br>  ○ recycling and reuse of materials<br>  ○ impact of equipment and machinery<br>• resources used in horticultural practices including energy, air, water, soil, forests, plants, and animals including human resources<br>• materials used in horticultural practices including inorganic/organic natural materials and manufactured products<br>• equipment, tools and office equipment relevant to horticultural practices |



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|---|---|
| | • processes used in horticultural practices including, work practices relating to transport, procurement and sourcing of materials and garden design<br>• legislation, standards, policies and regulations and codes that apply to sustainability and horticultural practices<br>• principles of sustainability and the positive and negative gains and losses of horticultural practices including environmental, economic and social aspects<br>• principles of systems thinking, design thinking and circularity to identify horticultural practices to reduce consumption, eliminate waste and facilitate re-use<br>• principles of life-cycle analysis and how to assess embodied energy and water of horticultural resources, materials, equipment and processes throughout their life cycle<br>• methods for identifying and quantifying resource usage<br>• sustainability frameworks used to guide workplace operations<br>• techniques to identify, analyse and assess sustainability impacts including:<br>  ○ systems thinking<br>  ○ design thinking and circularity<br>  ○ life cycle analysis<br>  ○ environmental risk assessments<br>• tools and techniques for evaluating sustainability improvements<br>• improvement strategies to eliminate, minimise or mitigate environmental, economic and societal impacts of resources, materials and processes used in horticultural practice. |
| **Assessment Conditions** | Assessment of the skills in this unit of competency must take place under the following conditions:<br>• workplace setting or an environment that accurately represents workplace conditions and access to:<br>  ○ computers and the internet to access information<br>  ○ resources and materials used in horticulture<br>  ○ scientific texts and information on principles of sustainability, sources of renewable or alternative energy resources<br>  ○ legislation, standards and policies that apply to sustainability.<br>Assessor requirements<br>No specialist vocational competency requirements for assessors apply to this unit. |

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|---|---|
| **Unit code** | **VU23601** |
| **Unit title** | **Develop and implement a pruning program** |
| **Application** | This unit describes the performance outcomes, skills and knowledge required to develop, implement and evaluate a pruning program and recommend improvements.<br>It requires the ability to apply knowledge of basic plant physiology and morphology, principles and techniques of specialist pruning and pruning tools and equipment to the process of determining pruning requirements.<br>This unit applies to learners working in all sectors of the horticulture industry who apply specialised skills and knowledge to develop and implement a pruning program for plants and specialist plants.<br>No occupational licensing, legislative or certification requirements apply to this unit at the time of publication. |
| **Pre-requisite Unit(s)** | N/A |
| **Competency Field** | N/A |
| **Unit Sector** | N/A |

| **Element** | | **Performance Criteria** | |
|---|---|---|---|
| Elements describe the essential outcomes of a unit of competency. | | Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the assessment requirements. | |
| | | | |
| 1 | Develop a pruning program | 1.1 | Identify target species and inspect plants for inclusion in the pruning program |
| | | 1.2 | Determine pruning requirements for plants and specialist plants according to the plant characteristics and desired outcomes |
| | | 1.3 | Identify biosecurity requirements and legislation, standards, policies and procedures relevant to pruning requirements for plants and specialist plants |
| | | 1.4 | Identify workplace health and safety hazards relevant to pruning requirements |
| | | 1.5 | Assess risks and establish suitable controls, according to workplace policies and procedures |
| | | 1.6 | Select the pruning tools and equipment according to pruning requirements |

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| | | 1.7 | Identify limits of own expertise and specify actions and/or programs to be undertaken by technical and specialised experts |
| | | 1.8 | Seek advice and engage technical and specialised experts required for specialist pruning requirements |
| | | 1.9 | Determine staff and equipment access and potential access limitations |
| | | 1.10 | Develop the pruning program, including costs and scheduled priorities to meet timelines and accommodate staffing resources, and communicate requirements to stakeholders |
| 2 | Implement and monitor the pruning program | 2.1 | Select and use tools, equipment and machinery according to workplace health and safety policies and procedures, biosecurity protocol requirements and manufacturer's specifications |
| | | 2.2 | Apply pruning techniques according to the pruning program within the limits of own expertise |
| | | 2.3 | Monitor and document pruning techniques according to the program and undertake risk management strategies |
| | | 2.4 | Clear and clean site, dispose of waste material, clean and store tools, equipment and machinery following biosecurity protocols |
| 3 | Evaluate the pruning program | 3.1 | Inspect plants to ensure pruning requirements have been met |
| | | 3.2 | Assess the results of pruning against the planned program |
| | | 3.3 | Recommend and record improvements to the effectiveness and efficiency of the program |

## Range of Conditions

Pruning activities should be undertaken at a height limit of no more than 1.8 metres. This unit does not cover aerial pruning from ladders, elevated work platforms or from climbing ropes and rigging in a tree. Specialist and technical experts should be consulted when required.

## Foundation Skills

| Skill | Description |
|---|---|
| Reading skills to: | interpret legislation, regulations, standards, policies, procedures and reference material relevant to pruning |
| Numeracy skills to: | interpret tool and/or machinery manufacturer's specifications values and/or data in a table, chart or graph |
| Problem-solving skills to: | apply biological concepts and processes to predict and explain pruning requirements |
| Technology skills to: | use computers, digital devices, software programs, and apps access pruning program requirements and data |
| Digital literacy skills to: | use computers, digital devices, software programs, and apps to research technical information relating to pruning requirements |

| Unit Mapping Information | | | |
|---|---|---|---|
| | Code and Title Current Version | Code and Title Previous Version | Comments |
| | VU23601 Develop and implement a pruning program | VU22739 Develop and implement a pruning program | Equivalent |

| Assessment Requirements Template | |
|---|---|
| **Title** | Assessment Requirements for VU23601 Develop and implement a pruning program. |
| **Performance Evidence** | There must be evidence the learner has completed the tasks outlined in the elements and performance criteria of this unit including evidence of the ability to prune at least three different plants according to the pruning program, using at least three of the following pruning tools:<br>○ secateurs<br>○ loppers or extension loppers<br>○ shears<br>○ pruning or pole saws<br>○ powered hedgers<br>○ powered secateurs<br>and has on at least one occasion:<br>• identified a range of different plant species and their pruning requirements and needs including formative, remedial or corrective pruning<br>• maintained and stored tools required for pruning following biosecurity protocols<br>• recognised when the services of specialist and technical expertise is required<br>• evaluated a pruning program and made recommendations for improvement. |
| **Knowledge Evidence** | The learner must be able to apply knowledge required to effectively perform the tasks outlined in elements and performance criteria of this unit. This includes knowledge of:<br>• biosecurity protocols relating to good hygiene for people, plant, process and equipment, including pest monitoring, weed management and prohibited use and practices and traceability measures<br>• resources for pruning including consumables, tools, equipment, machinery and labour<br>• specialist plants and plants that have special pruning requirements due to flowering, growth or other characteristics<br>• legal requirements including international, national, state and local acts and regulations relevant to pruning programs in a horticultural setting<br>• industry best practice, guidelines and standards for biosecurity, pruning, conservation, environmental management and protection for trees and heritage overlays relevant to pruning programs in a horticultural setting |



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| | • health and safety legislation, hazard and risk assessments and controls relevant to pruning programs in a horticultural setting<br>• basic plant physiology and morphology including:<br>  ○ plant function and responses to environmental conditions<br>  ○ form and external features and characteristics in relation to appearance, shape and structure<br>  ○ responses to pruning based on growth patterns, type of foliage, timing of flowering and fruiting<br>• work health and safety procedures and control measures for pruning operations and working outside<br>• risk management strategies to implement pruning program<br>• principles, methods and techniques of formative, remedial and/or corrective pruning, including canopy maintenance, canopy modification and reduction specialist plants and special pruning<br>• pruning tools and equipment and the advantages and disadvantages of use for different pruning techniques<br>• environmental considerations and procedures<br>• site and waste management and clean-up procedures<br>• recognising limits of own expertise and the point at which the scope or complexity of a given job necessitates the outsourcing of particular components of pruning program to specialist and technical expert services<br>• strategies to communicate with stakeholders and specialist and technical experts including written, electronic, verbal and, hand and whistle signals. |
| **Assessment Conditions** | Assessment of the skills in this unit of competency must take place under the following conditions:<br>• workplace setting or an environment that accurately represents workplace conditions and access to:<br>  ○ a range of plants<br>  ○ pruning tools and equipment<br>  ○ computers and the internet to access information<br>  ○ relevant standards, significant tree registers and/or legislation, specific to tree preservation orders, council by-laws, specialist texts, horticultural fact sheets and grower notes.<br>Assessor requirements<br>No specialist vocational competency requirements for assessors apply to this unit. |

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| **Unit code** | **VU23602** |
| **Unit title** | **Develop and implement a propagation program** |
| **Application** | This unit describes the performance outcomes, skills and knowledge required to plan, develop and implement a plant propagation program, identify variation and recommend improvements to meet program outcomes.<br>It requires the ability to determine the growing environment, plant material, plant treatments, growing media, tools, equipment, biosecurity procedures, and other resources required for a propagation program.<br>This unit applies to learners working in all sectors of the horticulture industry who apply specialised skills and knowledge to develop and implement a propagation program and recommend improvement.<br>No occupational licensing, legislative or certification requirements apply to this unit at the time of publication. |
| **Pre-requisite Unit(s)** | N/A |
| **Competency Field** | N/A |
| **Unit Sector** | N/A |

| **Element** | | **Performance Criteria** | |
|---|---|---|---|
| Elements describe the essential outcomes of a unit of competency. | | Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the assessment requirements. | |
| | | | |
| 1 | Plan a propagation program | 1.1 | Identify legislative and regulatory requirements, and industry practices that apply to plant propagation |
| | | 1.2 | Determine propagation techniques, timing and quantity of propagation material based on plant species, cultivar and horticultural practice, and growing on methods |
| | | 1.3 | Identify strategies for modifying the growing environment to achieve program outcomes |
| | | 1.4 | Identify hazards, assess risks and determine control limits, measures and corrective actions that ensure health and safety, hygiene, quality and biosecurity requirements |
| | | 1.5 | Research a range of propagation growing media and |

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| | | | container characteristics according to propagation techniques and needs of the plant species |
| 2 | Develop propagation program | 2.1 | Identify labour, work flow, materials, tools and equipment required for propagation program activities |
| | | 2.2 | Select environmental parameters, taking into account the type of plant and propagation method used |
| | | 2.3 | Determine propagation growing media and container requirements based on the propagation method and needs of the plant |
| | | 2.4 | Determine plant material requirements, including mother stock conditioning, when selecting specimens and collecting plant material |
| | | 2.5 | Identify biosecurity procedures for the propagation program |
| | | 2.6 | Determine monitoring and treatment strategies to maintain health of propagation material |
| | | 2.7 | Document propagation plan and schedule, including monitoring of propagation material health, water and nutrients requirements and environmental climate conditions |
| 3 | Implement propagation program | 3.1 | Comply with legal, regulatory and industry best practice requirements |
| | | 3.2 | Implement biosecurity requirements applicable to plant propagation activities |
| | | 3.3 | Select required tools and equipment and check for safe operation |
| | | 3.4 | Collect propagation material from appropriate mother stock resources and apply suitable conditioning treatment and storage requirements |
| | | 3.5 | Prepare propagation components and growing media |
| | | 3.6 | Propagate plant material, using correct preparation treatments, according to the propagation program |
| | | 3.7 | Label units or batches to enable tracking of propagated material |
| | | 3.8 | Place propagated material into suitable environment for propagation cycle |
| | | 3.9 | Complete propagation activities ensuring work site is clean and waste collected and disposed of, or recycled |
| 4 | Implement growing on requirements | 4.1 | Apply after care treatments to suit media conditions, plant requirements and propagation techniques employed |



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| | | 4.2 | Complete documentation of propagation activities and record any cultural or chemical intervention procedures required during growing on period |
| 5 | Review the propagation program | 5.1 | Assess propagated plants for health, quality and viability according to program outcomes |
| | | 5.2 | Identify and record variances from planned and scheduled activities |
| | | 5.3 | Recommend and document strategies for potential improvements to meet program outcomes |

## Range of Conditions

N/A

## Foundation Skills

| Skill | Description |
|---|---|
| Numeracy skills to: | analyse basic statistical data to monitor performance and success of propagation activities |
| Technology skills to: | use computers, digital devices, software programs, and apps to access propagation activities, legal requirements and propagation performance |
| Digital literacy skills to: | use computers, digital devices, software programs, and apps to research information on plant propagation and legal requirements |

| Unit Mapping Information | | | |
|---|---|---|---|
| | Code and Title Current Version | Code and Title Previous Version | Comments |
| | VU23602 Develop and implement a propagation program | VU22740 Develop and implement a propagation program | Not equivalent |

| Assessment Requirements Template | |
|---|---|
| **Title** | Assessment Requirements for VU23602 Develop and implement a propagation program. |
| **Performance Evidence** | There must be evidence the learner has completed the tasks outlined in the elements and performance criteria of this unit and developed, implemented and reviewed a plant propagation program for at least two plant species with different propagation requirements. Evidence for each plant species propagated should include:<br>• the propagation program plan with researched information from a range of sources<br>• the rationale for the identification and selection, collection and storage of healthy parent plants, mother stock and other propagation materials, and propagation techniques used for the plant species<br>• specifications for growing environment, media, equipment and materials used for growing on and aftercare of plants<br>• legislative, regulatory and licensing compliance required for the program including workplace health and safety and biosecurity protocols<br>• an overview of the planning, implementation and outcomes of the propagation plan<br>• recommendations for improvement to the propagation program. |
| **Knowledge Evidence - current** | The learner must be able to apply knowledge required to perform effectively the tasks outlined in elements and performance criteria of this unit. This includes knowledge of:<br>• relevant legal requirements including international, national, state and local acts and regulations that relate to plant propagation and the sourcing of plant material<br>• biosecurity protocols for use in a plant propagation program<br>• industry practices for plant propagation, including:<br>  ○ propagation techniques<br>  ○ sources of plant material and collecting ethics<br>  ○ quality and continuous improvement processes<br>  ○ sustainability frameworks and guidelines relating to waste disposal, recycling and re-use<br>• resources including growing media, containers, tools, equipment, machinery and other materials, staff and budget<br>• work health and safety hazards relevant to working outside and propagation activity<br>• principles and practices for developing and implementing a propagation program, including: |



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| | ○ preferred types of propagation growing media for different plant species<br>○ propagation techniques, treatments and environmental conditions required for a range of plant species includes biosecurity and interventions<br>○ plant treatments, cultural chemical, and biological pest, weed and disease control techniques<br>○ common propagation activity problems and preventative actions<br>○ quality specifications for parent plants, propagation growing media and resources<br>○ testing methods applied to propagation growing media<br>○ aftercare, conditioning and storage requirements for a range of propagated plant species<br>○ performance data to measure success<br>○ legislative, regulatory and licensing arrangements<br>• characteristics and types of growing media used for plant propagation<br>• types of propagation containers including:<br>○ community trays<br>○ cells/plugs and tubes<br>○ S1020s, jiffy pots and ellepots<br>○ biodegradable polymer net<br>• environmental parameters including:<br>○ temperature, light and, humidity<br>○ soil or growing media moisture levels, pH<br>○ water supply and irrigation of plants<br>○ pathogens, pest and disease<br>• bio-secure area requirements including environmental conditions and storage<br>• processes and techniques for preparing, costing, documenting and reviewing plans and scheduling propagation activities. |
| **Assessment Conditions** | Assessment of the skills in this unit of competency must take place under the following conditions:<br>• workplace setting or an environment that accurately represents workplace conditions suitable for plant propagation and access to:<br>○ plant material suitable for a range of propagation methods and practices materials, tools and equipment relevant to plant propagation<br>○ computers and the internet to access information<br>○ Australian Standards, legislation and codes of practice and standards and policies that apply to plant propagation. |

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| | Assessor requirements<br>No specialist vocational competency requirements for assessors apply to this unit. |

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| **Unit code** | **VU23603** |
| **Unit title** | **Manage the care and maintenance of trees** |
| **Application** | This unit describes the performance outcomes, skills and knowledge required to manage the care and maintenance of trees in a horticultural setting.<br>It requires the ability to identify tree species and assess the general health and condition of trees and soil, recommend treatments according to safety and environmental procedures and seek specialist and technical advice for the maintenance of tree health.<br>This unit applies to learners working in all sectors of the horticulture industry who apply specialised skills and knowledge to develop a tree maintenance plan.<br>No occupational licensing, legislative or certification requirements apply to this unit at the time of publication. |
| **Pre-requisite Unit(s)** | N/A |
| **Competency Field** | N/A |
| **Unit Sector** | N/A |

| **Element** | | **Performance Criteria** | |
|---|---|---|---|
| Elements describe the essential outcomes of a unit of competency. | | Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the assessment requirements. | |
| | | | |
| 1 | Examine trees to determine condition | 1.1 | Identify and describe a range of trees to species level |
| | | 1.2 | Assess tree health and vigour, identifying potential issues or decline, according to the characteristics of the species |
| | | 1.3 | Assess trunk and branch structure and architecture, identifying potential issues or need for rectification, according to the characteristics of the species |
| | | 1.4 | Identify abiotic factors affecting tree health |
| | | 1.5 | Identify biotic factors affecting tree health |
| | | 1.6 | Identify cultural practices that may have an effect on tree health |

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| | | 1.7 | Record observations and results of tree assessment |
| 2 | Assess site conditions | 2.1 | Perform a site assessment and liaise with client to identify conditions that may impact upon the health of trees on site |
| | | 2.2 | Identify factors that may impact on soil condition and determine the relationship between soil condition and the health of trees |
| | | 2.3 | Undertake relevant soil tests |
| | | 2.4 | Record results and plan soil amendment strategies required for tree care |
| 3 | Develop tree maintenance plan | 3.1 | Research the biosecurity, legal and environmental protection requirements that may impact on the care and maintenance of trees |
| | | 3.2 | Identify workplace health and safety hazards and environmental impacts of tree management and plan control measures |
| | | 3.3 | Identify maintenance requirements for trees according to identified condition |
| | | 3.4 | Select treatments for identified maintenance requirements |
| | | 3.5 | Source and cost resources, tools, equipment and machinery required for tree maintenance and confirm availability with suppliers, contractors and appropriate personnel |
| | | 3.6 | Determine preventative approaches to tree management and care and incorporate into the maintenance plan |
| | | 3.7 | Document tree maintenance plan, including useful landscape life expectancy and risk management strategies |
| 4 | Source technical and specialist expert services | 4.1 | Identify limits of own expertise and specify actions or programs to be undertaken by technical and specialised experts |
| | | 4.2 | Seek advice from technical and specialised experts for specified tree care and maintenance actions or programs |
| | | 4.3 | Use specialist and technical advice to prioritise tree maintenance work activities and adjust maintenance plan |
| | | 4.4 | Communicate maintenance plan to relevant stakeholders |

## Range of Conditions

Tree care and maintenance activities should be undertaken at a height limit of no more than 1.8 metres. This unit does not cover aerial pruning from ladders, elevated work platforms or from climbing ropes and rigging in a tree. Specialist and technical experts should be consulted when required.

## Foundation Skills

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|---|---|
| Reading skills to: | interpretation of expert advice reports |
| Numeracy skills to: | calculate volume, weight and ratio for determining and applying treatments to trees |
| Technology skills to: | use computers, digital devices, software programs, and apps to access information on tree care and maintenance |
| Digital literacy skills to: | use computers, digital devices, software programs, and apps to research technical information relating to tree care and maintenance |

| **Unit Mapping Information** | | | |
|---|---|---|---|
| | Code and Title Current Version | Code and Title Previous Version | Comments |
| | VU23603 Manage the care and maintenance of trees | VU22741 Manage the care and maintenance of trees | Equivalent |

| Assessment Requirements Template | |
|---|---|
| **Title** | Assessment Requirements for VU23603 Manage the care and maintenance of trees. |
| **Performance Evidence** | There must be evidence the learner has completed at least once the tasks outlined in the elements and performance criteria of this unit and, on at least one occasion, developed and documented a tree care and maintenance plan for trees in a horticultural setting. The tree care and maintenance plan should include:<br>• an assessment of site conditions including soil test outcomes<br>• a report on the health and condition of trees identified for inclusion in the plan that includes:<br>  ○ name of tree species identified and location on site<br>  ○ characteristics indicating the level of vigour in trees<br>  ○ structural defects in trunk and branch architecture that indicate potential issues in trees<br>  ○ diseases, pests and symptoms of decline in trees identified<br>• a summary of legislative and regulatory requirements that apply to tree care and maintenance works on the site<br>• an assessment of workplace health and safety hazards and environmental impacts of tree management and plan control measures<br>• a summary of information provided by specialist and technical experts for tree care and maintenance works. |
| **Knowledge Evidence** | The learner must be able to apply knowledge required to effectively perform the tasks outlined in elements and performance criteria of this unit. This includes knowledge of:<br>• principles and practices of tree identification, including:<br>  ○ morphology and sensory characteristic<br>  ○ phylogenetic similarities<br>  ○ plant taxonomy and naming trees to species level<br>  ○ tree families common to the local area<br>  ○ using plant keys, field guides, databases and botanical references<br>• tree growth and development, including:<br>  ○ physiology cellular, tissue and organ function<br>  ○ interactions with environmental factors<br>  ○ how it relates to structural integrity/tissues<br>• tree health assessment including: |

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| | ○ signs and symptoms of poor health and vigour<br>○ methods of detecting decay and structural defects in trees<br>○ use of basic diagnostic tools and testing equipment<br>○ factors affecting the likelihood of tree failure<br>• symptoms and signs of poor health and vigour in trees including:<br>○ disease and pests<br>○ deficiencies<br>○ disorders and growth form of trees<br>• factors affecting tree health, including:<br>○ abiotic and biotic<br>○ cultural practices<br>• treatments used for recognised common diseases, pests and tree disorders<br>• testing and evaluating soils for physical and chemical properties<br>• principles and methods of pruning within limits of own expertise<br>• maintenance requirements for trees within limits of own expertise and required legislation, restrictions and standards<br>• common tree disorders specific to tree species includes pests and diseases, nutritional deficiencies and toxicities, soil diseases and conditions, compartmentalisation of decay in trees (CODIT), structural faults and defects of trees<br>• measures to prevent tree damage and environmental health issues<br>• relevant legislative requirements applicable to the care and maintenance of trees including international, national, state acts and regulations including workplace health and safety and biosecurity requirements<br>• local government regulations and planning relating to tree works including environmental and heritage overlays<br>• industry practices, standards and guidelines for the conservation, environmental management and protection of trees including relevant Australian Standards for the pruning, care, maintenance and protection of trees<br>• components of a tree maintenance plan including:<br>○ health, condition and maintenance requirements<br>○ pruning cycles, frequency and operations<br>○ soils analysis and growing conditions<br>○ tree protection from development and construction sites |

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| | ○ habitat protection<br>○ pest and disease controls and control strategies<br>○ risk management strategies to identify and control occupational health and safety and workplace health and safety hazards<br>○ strategies for ensuring tree maintenance activities meet pruning specifications<br>• resources to manage the care and maintenance of trees including consumables, tools, equipment, machinery and labour<br>• research methods to source horticultural information and advice and services from technical and specialist experts<br>• workplace procedures for communicating with stakeholders. |
| **Assessment Conditions** | Assessment of the skills in this unit of competency must take place under the following conditions:<br>• workplace setting or an environment that accurately represents workplace conditions and access to:<br>○ trees, tools and equipment<br>○ computers and the internet to access information<br>○ relevant legislation, standards, policies and industry references and publications.<br>Assessor requirements<br>No specialist vocational competency requirements for assessors apply to this unit. |

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| **Unit code** | **VU23604** |
| **Unit title** | **Plan, establish and maintain lawns** |
| **Application** | This unit of competency describes the performance outcomes, skills and knowledge required to plan, establish, maintain and monitor lawn in public recreational open space, and domestic situations.<br>It requires the ability to select plant species and cultivars for growth habits and cultural requirements to suit soil and environmental conditions, and encourage the use of lawn plant species that require less maintenance, consumption of water and other resources.<br>This unit applies to learners working in all sectors of the horticulture industry who apply specialised skills and knowledge to plan, establish, maintain and monitor lawn in public recreational open spaces, and domestic situations.<br>No occupational licensing, legislative or certification requirements apply to this unit at the time of publication. |
| **Pre-requisite Unit(s)** | N/A |
| **Competency Field** | N/A |
| **Unit Sector** | N/A |

| **Element** | | **Performance Criteria** | |
|---|---|---|---|
| Elements describe the essential outcomes of a unit of competency. | | Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the assessment requirements. | |
| 1 | Plan the establishment and maintenance of lawn plant species | 1.1 | Confirm client preferences and requirements for proposed site |
| | | 1.2 | Assess site for existing conditions and perform necessary soil tests |
| | | 1.3 | Investigate and select plant species or species cultivars and planting methods to suit site and client requirements |
| | | 1.4 | Identify and comply with relevant legislation that may impact on the establishment of lawn on the site |
| | | 1.5 | Identify environmental impact of proposed works, and recommend actions to minimise impact according to legislative and regulatory requirements |
| | | 1.6 | Identify the workplace health and safety hazards |

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| | | | associated with plant establishment works and assess and control risks |
| | | 1.7 | Develop and document the plan for the pre and post establishment and ongoing maintenance of the area and confirm with client |
| | | 1.8 | Determine resources and contractor requirements for planting and establishment of lawn plant species |
| | | 1.9 | Prepare a list of materials and costs and confirm availability with suppliers |
| 2 | Establish lawn | 2.1 | Organise resources required for plant establishment |
| | | 2.2 | Undertake pre-establishment procedures according to the plan |
| | | 2.3 | Establish lawn plant species using planting or installation method consistent with the plant species requirements identified in the plan |
| | | 2.4 | Implement post-establishment and maintenance procedures according to the plan |
| | | 2.5 | Monitor the newly established planted area, identify any problems and implement required changes to the plan |
| 3 | Maintain and monitor lawn | 3.1 | Identify the maintenance requirements covering a range of conditions and purposes according to published data on the species or cultivar, historical records and own experience |
| | | 3.2 | Identify and confirm availability of labour and resources required for plant maintenance |
| | | 3.3 | Identify the workplace health and safety and workplace health and safety hazards and environmental implications associated with the maintenance plan |
| | | 3.4 | Plan and implement cyclical maintenance procedures according to the scope and standards required by the client |
| | | 3.5 | Monitor and review the maintenance plan and take remedial action in response to changing conditions |

| Range of Conditions |
|---|
| N/A |

| Foundation Skills | |
|---|---|
| **Skill** | **Description** |
| Reading skills to: | undertake research to source, examine and compare botanical and technical lawn establishment information |
| Numeracy skills to: | calculate resource usage requirements for lawn establishment<br>interpret values for lawn establishment materials and other resources presented in a table, chart or graph |
| Problem-solving skills to: | analyse soil test results and draw valid conclusions |
| Planning and organising skills to: | develop, review and evaluate lawn or lawn alternative pre and post establishment and maintenance plan |
| Technology skills to: | use computers, digital devices, software programs, and apps to access information and data related to lawn establishment |
| Digital literacy skills to: | use computers, digital devices, software programs, and apps to research information relevant to the lawn site, resources and materials |

| Unit Mapping Information | | | |
|---|---|---|---|
| | Code and Title Current Version | Code and Title Previous Version | Comments |
| | VU23604 Plan, establish and maintain lawns | VU22742 Plan, establish and maintain lawns and lawn alternatives | Equivalent |

| Assessment Requirements Template | |
|---|---|
| **Title** | Assessment Requirements for VU23604 Plan, establish and maintain lawns |
| **Performance Evidence** | There must be evidence the learner has completed at least once the tasks outlined in the elements and performance criteria of this unit and, on at least one occasion:<br>• prepared a plan for the establishment, maintenance and monitoring of a lawn as per client preferences and relevant legislation, regulations and codes of practice for a site that includes:<br>  ○ an assessment of the site conditions and potential environmental impacts of the works<br>  ○ selection rationale for lawn plant species<br>  ○ procedures for the establishing and maintaining a lawn<br>  ○ chemicals as per licensing and application requirements<br>  ○ hazard and risk assessment for each stage of the works complying with occupational health and safety and workplace health and safety hazards requirements<br>  ○ a lawn establishment schedule of works with costs of materials and resources for each stage of works<br>  ○ resources and contractor requirements for planting and establishment of lawn<br>• reviewed and made changes to the lawn establishment, maintenance and monitoring plan based on lawn establishment monitoring outcomes. |
| **Knowledge Evidence** | The learner must be able to demonstrate essential knowledge required to effectively do the tasks outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of:<br>• site assessment principles and practices to determine site condition, suitability for purpose and use and planting requirements<br>• workplace health and safety procedures to identify hazards and assess risks associated with the site assessment, pre and post establishment and maintenance<br>• soil tests and test procedures for site assessment<br>• plant species selection for use in a lawn and planting methods<br>• environmental impacts of establishing a lawn including weed potential of plant species selected for lawns<br>• growth habits and cultural requirements of specific lawn plant species and cultivars under a range of soil and environmental conditions |

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| | • maintenance requirements and procedures for specific lawn plant species and cultivars after initial establishment<br>• nutrient requirements of specific lawn plant species and cultivars and the effects of nutrient deficiency and toxicity on individual plant species and cultivars, including visual symptoms<br>• the use of additives and ameliorants to enhance the available nutrition for specific plant species and cultivars<br>• characteristics of simple and compound fertiliser products used for lawn plant species<br>• work plan requirements including pre and post-establishment activities, maintenance, staged timelines, costing and availability of resources and equipment and relevant procedures<br>• required resources, machinery, equipment and tools for lawn plant species pre and post-establishment and maintenance<br>• post-establishment requirements for plant maintenance including renovation, replanting and repairing<br>• plant maintenance procedures including monitoring health, nutrient and fertiliser requirements, soil testing, disease, pest and weed controls, mowing, rolling and aerating<br>• relevant workplace health and safety and environmental requirements including international, national, state and local acts and regulations, industry best practice, guidelines and standards including:<br>  ○ biosecurity and chemical licensing<br>  ○ heritage overlays, covenants, easements, prohibited plant species<br>  ○ land- use restrictions, ownership rights<br>  ○ environmental protection<br>  ○ workplace health and safety hazards and risk control<br>  ○ traffic management<br>• remedial actions including adjustments to irrigation scheduling and nutrient application rates, pest and disease control for lawn species, replacement of stock, changes to soil management practices, and rescheduling maintenance tasks. |
| | Assessment of the skills in this unit of competency must take place under the following conditions:<br>• a real or simulated workplace environment and site for establishing a lawn and access to:<br>  ○ a range of lawn plant species, materials, tools and equipment<br>  ○ relevant legislation, regulations and Codes of Practice<br>  ○ computers and industry references and publications. |

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| | Assessor requirements<br>No specialist vocational competency requirements for assessors apply to this unit. |

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| **Unit code** | **VU23605** |
| **Unit title** | **Use and apply geographical information system (GIS) technology** |
| **Application** | This unit describes the performance outcomes, skills and knowledge of geographical information system (GIS) technology to support operational activities and decision making within an organisation.<br>It requires the ability to use GIS software to create maps and geographical models, integrated with other organisational systems to for operational work tasks.<br>This unit applies to those working in all sectors of the horticulture industry who apply specialised skills and knowledge to use and apply GIS technology for enterprise activities.<br>No occupational licensing, legislative or certification requirements apply to this unit at the time of publication |
| **Pre-requisite Unit(s)** | N/A |
| **Competency Field** | N/A |
| **Unit Sector** | N/A |

| **Element** | | **Performance Criteria** | |
|---|---|---|---|
| Elements describe the essential outcomes of a unit of competency. | | Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the assessment requirements. | |
| | | | |
| 1 | Research the use of GIS applications for work functions | 1.1 | Research GIS technology used to support operational tasks and decision making |
| | | 1.2 | Investigate GIS applications used to support work functions |
| | | 1.3 | Examine the sources of spatial data capture used in organisational operations |
| | | 1.4 | Examine the use of equipment and software for spatial data capture |
| | | 1.5 | Source independent technical advice and sources of information relating to GIS technology |
| | | 1.6 | Review the compatibility and usability of GIS for integration with other organisational systems |
| 2 | Use GIS system for work task | 2.1 | Determine specified work task outcomes using GIS |
| | | 2.2 | Identify methods of data capture as appropriate for the specified outcomes |

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| | | 2.3 | Identify and interpret data for modelling and mapping purposes for operational applications |
| | | 2.4 | Identify limitations and the level of inaccuracies in GIS relating to the work function task |
| | | 2.5 | Use GIS application, and other compatible integrated operational systems required to meet work task outcomes |
| | | 2.6 | Comply with standards, workplace policies and legislative requirements for documentation and storage of relevant information |
| 3 | Evaluate the use of GIS applications to support operational decisions | 3.1 | Develop assessment criteria to assess the effectiveness of GIS technology in the workplace to support operational decisions |
| | | 3.2 | Use assessment criteria to evaluate work task outcomes |
| | | 3.3 | Identify limitations of the GIS application for the work task |
| | | 3.4 | Report evaluation to organisational stakeholders in accordance with workplace procedures |

## Range of Conditions

N/A

## Foundation Skills

| Skill | Description |
|---|---|
| Writing skills to: | record and report workplace outcomes using clear language and correct concepts and terminology |
| Planning and organising skills to: | effectively gather, select and present geospatial information and data |
| Technology skills to: | use computers, digital devices, software programs, and apps to access GIS and compatible workplace operational and database systems |
| Digital literacy skills to: | use computers, digital devices, software programs, and apps access, manipulate and present GIS data and/or information in a diagrammatic format |

| Unit Mapping Information | | | |
|---|---|---|---|
| | Code and Title Current Version | Code and Title Previous Version | Comments |
| | VU23605 Use and apply geographical | VU22743 Select, use and apply | Not equivalent |

| | | | |
|---|---|---|---|
| | information system (GIS) technology | geographical information system (GIS) technology | |

| Assessment Requirements Template | |
|---|---|
| **Title** | Assessment Requirements for VU23605 Use and apply geographical information system (GIS) technology |
| **Performance Evidence** | There must be evidence the learner has completed the tasks outlined in the elements and performance criteria of this unit and for at least one work task:<br>• identified the work task outcome specifications<br>• used the Geographic Information System (GIS) application software and equipment required for the task<br>• interpreted management maps/plans and accessed other sources of spatial data and information as required to meet the task specifications<br>• produced digital maps or modelling as required for the work task<br>• evaluated and reported on the use of GIS to support work planning and operational decision making. |
| **Knowledge Evidence** | The learner must be able to apply knowledge required to effectively perform the tasks outlined in elements and performance criteria of this unit. This includes knowledge of:<br>• basic principles of GIS technology, mapping and applications<br>• range of GIS technology options available to support organisational activities including equipment hardware and software requirements<br>• methods of spatial data capture for use in GIS applications<br>• devices used to capture spatial data<br>• spatial data types, limitations and sources of inaccuracies and errors<br>• modelling and mapping including use of GIS tools for simple queries, integration of 2 and 3 dimensional characteristics, topological, hydrological, cartographic and overlays<br>• context in which particular organisations operate and how these may impact on the use of technology<br>• integration of GIS applications with organisational asset management programs and other sources of information<br>• file formats for map and modelling production<br>• organisational data storage and distribution policies and procedures<br>• legislation and standards relevant to digital data storage and use including privacy legislation. |
| **Assessment Conditions** | Assessment of the skills in this unit of competency must take place under the following conditions:<br>• a workplace setting or an environment that accurately represents workplace conditions and access to: |



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|---|---|
| | ○ computers, GIS software, spatial data capture devices and the internet<br>Assessor requirements<br>No specialist vocational competency requirements for assessors apply to this unit. |