

## Modification history

Release	Comments
Release 1	This version released with AHC Agriculture, Horticulture, Conservation and Land Management Training Package Version 5.0.

AHPCPM5XX	Apply knowledge of plant physiology to horticultural practices
<b>Application</b>	<p>This unit of competency describes the skills and knowledge required to research plant structures, investigate plant growth and responses to horticultural practices, and analyse plant reproduction for horticultural practices.</p> <p>The unit applies to individuals who apply specialist skills and knowledge to the application of knowledge of plant physiology to horticultural practices, and take personal responsibility and exercise autonomy in undertaking complex work. They analyse and synthesise information, design and communication solutions to sometimes complex problems.</p> <p>All work is carried out to comply with workplace procedures, health and safety in the workplace requirements, legislative and regulatory requirements, and sustainability and biosecurity practices.</p> <p>No licensing, legislative or certification requirements apply to this unit at the time of publication.</p>
<b>Prerequisite Unit</b>	Nil
<b>Unit Sector</b>	Plants culture and management (PCM)

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Research plant structures	1.1 Identify and categorise plant cell structures, the organisation of cells into primary tissues and plant structural features 1.2 Determine the functions of plant cells, primary tissues and plant structural features and their relation to plant growth 1.3 Explain the physiological processes of photosynthesis, cellular respiration, transpiration and translocation in plants, including their role in plant function
2. Investigate plant growth responses to horticultural practices	2.1 Analyse physiological plant responses to physical and environmental conditions, including the horticultural practices that may impact on plant functioning 2.2 Examine the role of plant growth regulators on plant growth and function 2.3 Evaluate information on plant growth responses and the addition of plant growth regulators and the implications for horticultural practices 2.4 Research and describe methods to manipulate the physical and environmental conditions to achieve desired plant growth responses in horticultural practices
3. Analyse plant reproduction for horticultural practices	3.1 Identify the physiological processes of asexual and sexual reproduction of plants 3.2 Describe the methods of seed and propagule dispersal used by plants 3.3 Research and evaluate plant reproduction information for a range of plants

<b>Foundation Skills</b>	
<i>This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.</i>	
<b>Skill</b>	<b>Description</b>
Reading	<ul style="list-style-type: none"> <li>Identify and interpret information regarding botanical and biological references and information relevant to plant physiology and horticultural practices</li> </ul>
Oral communication	<ul style="list-style-type: none"> <li>Initiate discussions, using clear language to explain the physiological processes of photosynthesis, cellular respiration, transpiration and translocation in plants, including their role in plant function</li> <li>Use clear language, to report on the manipulation of physical and environmental factors to achieve optimum plant health</li> <li>describe methods of seed and propagule dispersal used by plants</li> </ul>

<b>Unit Mapping Information</b>			
<b>Code and title current version</b>	<b>Code and title previous version</b>	<b>Comments</b>	<b>Equivalence status</b>
AHPCPM5XX Apply knowledge of plant physiology to horticultural practices	Not applicable	New unit	No equivalent unit

<b>Links</b>	Companion Volumes, including Implementation Guides, are available at VETNet: <a href="https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72">https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72</a>
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<b>TITLE</b>	<b>Assessment requirements for AHPCPM5XX Apply knowledge of plant physiology to horticultural practices</b>
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**Performance Evidence**

An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit. There must be evidence that the individual has applied knowledge of plant physiology to horticultural practices on at least two occasions and has:

- researched plant internal and external structures, including cell structures, primary tissues, and plant structural features
- investigated and described plant growth responses to horticultural practices
- analysed plant reproduction, including asexual and sexual reproduction of plants and methods of seed and propagule dispersal
- researched and evaluated plant reproduction information for a range of plants
- applied knowledge of plant responses to physical and environmental conditions to manipulate plants for desired horticultural outcomes.

**Knowledge Evidence**

An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:

- plant cell structures and components, including:
  - cell wall
  - cell membrane
  - nucleus
  - vacuole
  - cytoplasm
  - mitochondrion
  - chloroplasts
  - other organelles
- plant primary tissues, including:
  - xylem
  - phloem
  - cuticle
  - epidermis
  - cortex
  - vascular cambium
  - vascular rays
  - stomata
  - parenchyma
  - sieve tubes
  - meristem
- plant structural features, including:
  - roots
  - stems
  - leaves
  - flowers
  - fruit
- plant functions, including:
  - diffusion
  - osmosis
  - photosynthesis
  - respiration
  - transpiration
  - translocation
- physical and environmental conditions that may impact on plant function, including:
  - light quantity, quality and duration
  - availability of water
  - temperature range

<b>Knowledge Evidence</b>
<ul style="list-style-type: none"> <li>• frost</li> <li>• wind</li> <li>• air quality</li> <li>• soil conditions including availability of a range of mineral nutrients, compaction and drainage</li> <li>• presence of competing plants, diseases and pests</li> <li>• influence of building, walls and paving</li> <li>• horticultural practices that may impact on plant function, including:               <ul style="list-style-type: none"> <li>• the selection, growing, management and maintenance of plants</li> <li>• the manipulation and management of growing environments</li> <li>• plant protection</li> <li>• propagating and disbudding</li> <li>• pruning techniques, including; crown reduction, thinning and root pruning</li> <li>• creation of artificial microclimates and growing environments</li> <li>• use of soil ameliorants and mulches</li> <li>• fertilising and watering regimes</li> <li>• location of plants in relation to light, moisture, air pollutants and competition with other plants</li> </ul> </li> <li>• the role of plant growth regulators in plant responses</li> <li>• the manipulation of physical and environmental conditions for desired plant growth outcomes</li> <li>• the asexual reproduction of plants through natural vegetative reproduction and the propagation of plants through horticultural practices, including stem, leaf and root:               <ul style="list-style-type: none"> <li>• cuttings</li> <li>• division</li> <li>• grafting</li> <li>• layering</li> </ul> </li> <li>• sexual reproduction of plants, including:               <ul style="list-style-type: none"> <li>• the development of gametes</li> <li>• pollination</li> <li>• fertilisation and embryo development</li> <li>• seed</li> <li>• fruit</li> </ul> </li> <li>• the range of dispersal characteristics of seeds and other propagule, including:               <ul style="list-style-type: none"> <li>• size</li> <li>• shape structure</li> <li>• wind, water or vector dispersal</li> </ul> </li> <li>• the application of plant reproduction processes for use in horticultural practices</li> <li>• botanical and biological references and publications relevant to plant physiology, including:               <ul style="list-style-type: none"> <li>• the International Code of Botanical Nomenclature (ICBN)</li> <li>• the International Code of Nomenclature for Cultivated Plants (ICNCP).</li> </ul> </li> </ul>

<b>Assessment Conditions</b>
<p>Assessment of skills must take place under the following conditions:</p> <ul style="list-style-type: none"> <li>• physical conditions:           <ul style="list-style-type: none"> <li>• a workplace setting or an environment that accurately represents workplace conditions</li> </ul> </li> <li>• resources, equipment and materials:           <ul style="list-style-type: none"> <li>• access to a wide range of plants that grow in a range of horticultural settings</li> <li>• microscope</li> <li>• computer</li> <li>• industry publications and internet sources of information relevant to applying knowledge of plant physiology to horticultural practices</li> </ul> </li> <li>• specifications:           <ul style="list-style-type: none"> <li>• botanical and biological references and publications relevant to plant physiology</li> </ul> </li> <li>• relationships:           <ul style="list-style-type: none"> <li>• clients</li> </ul> </li> <li>• timeframes:           <ul style="list-style-type: none"> <li>• according to job requirements.</li> </ul> </li> </ul>

<b>Assessment Conditions</b>	
Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.	
<b>Links</b>	Companion Volumes, including Implementation Guides, are available at VETNet: <a href="https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72">https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72</a>

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