



Australian Government

AHCPCM509 Apply knowledge of plant physiology to horticultural practices

Release: 1

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Modification History

Release	Comments
Release 1	This version released with AHC Agriculture, Horticulture and Conservation and Land Management Training Package Version 6.0.

Application

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.

The unit applies to individuals who apply specialist skills and knowledge to apply knowledge of plant physiology to horticultural practices, and take personal responsibility and exercise autonomy in undertaking complex work. They analyse and synthesise information, and design and communicate solutions to sometimes complex problems.

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.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Unit Sector

Plant Culture and Management (PCM)

Elements and Performance Criteria

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

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.2 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 and 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

Foundation Skills

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.

Skill	Description
Reading	Identify and interpret information regarding botanical and biological references and information relevant to plant physiology and horticultural practices
Oral communication	Use clear language and accurate industry terminology to explain the physiological processes of photosynthesis, cellular respiration, transpiration and translocation in plants, including their role in

Skill	Description
	plant function, and describe the manipulation of physical and environmental factors to achieve desired plant growth responses and optimum plant health

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
AHCP509 Apply knowledge of plant physiology to horticultural practices	Not applicable	The unit has been created to address an emerging skill required by industry	Newly created

Links

Companion Volumes, including Implementation Guides, are available at VETNet: -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72>

Assessment Requirements for AHPCPM509 Apply knowledge of plant physiology to horticultural practices

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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
- applied knowledge of plant responses to physical and environmental conditions to manipulate plants for desired horticultural outcomes
- 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.

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:

- botanical and biological references and publications relevant to plant physiology, including:
 - the International Code of Botanical Nomenclature (ICBN)
 - the International Code of Nomenclature for Cultivated Plants (ICNCP)
- 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
 - frost
 - wind
 - air quality
 - soil conditions, including availability of a range of mineral nutrients, compaction and drainage
 - presence of competing plants, diseases and pests
 - influence of building, walls and paving
- horticultural practices that may impact on plant function, including:
 - the selection, growing, management and maintenance of plants

- the manipulation and management of growing environments
- plant protection
- propagating and disbudding
- pruning techniques, including crown reduction, thinning and root pruning
- creation of artificial microclimates and growing environments
- use of soil ameliorants and mulches
- fertilising and watering regimes
- location of plants in relation to light, moisture, air pollutants and competition with other plants
- the role of plant growth regulators in plant responses
- the manipulation of physical and environmental conditions for desired plant growth outcomes
- the asexual reproduction of plants through natural vegetative reproduction and the propagation of plants through horticultural practices, including stem, leaf and root:
 - cuttings
 - division
 - grafting
 - layering
- sexual reproduction of plants, including:
 - the development of gametes
 - pollination
 - fertilisation and embryo development
 - seed
 - fruit
- the range of dispersal characteristics of seeds and other propagule, including:
 - size
 - shape structure
 - wind, water or vector dispersal
- the application of plant reproduction processes for use in horticultural practices.

Assessment Conditions

Assessment of the skills in this unit of competency must take place under the following conditions:

- physical conditions:
 - a workplace setting or an environment that accurately represents workplace conditions
- resources, equipment and materials:
 - access to a wide range of plants that grow in a range of horticultural settings
 - microscope
 - computer

- industry publications and internet sources of information relevant to applying knowledge of plant physiology to horticultural practices
- specifications:
 - botanical and biological references and publications relevant to plant physiology
- timeframes:
 - according to job requirements.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

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