



Australian Government

AHCARB514 Diagnose tree diseases

Release: 1

AHCARB514 Diagnose tree diseases

Modification History

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

Application

This unit of competency describes the skills and knowledge required to diagnose tree diseases and develop a management program for their control. Diseases include pathogens, pests and other disorders of angiosperms, gymnosperms and woody monocotyledons.

The unit applies to individuals who work in arboriculture and analyse information and exercise judgement to complete a range of advanced skilled activities and demonstrate deep knowledge in a specific technical area. They have accountability for the work of others and analyse, design and communicate solutions to a range of complex problems.

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

Pre-requisite Unit

Nil

Unit Sector

Arboriculture (ARB)

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. Assess environmental impact	1.1 Identify tree species and determine its region of origin and seasonal growth characteristics 1.2 Determine current and past cultural practices and impact on tree health 1.3 Determine characteristics of growing environment affecting growth of tree

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.4 Identify environmental and cultural factors predisposing tree to disease 1.5 Determine and assess physical and chemical properties of the soil or growing media
2. Identify diseased trees	2.1 Identify trees displaying disease symptoms 2.2 Recognise natural defence systems of trees for major disease types 2.3 Determine disease groups according to classification 2.4 Investigate trees for signs and symptoms of disease 2.5 Determine impact of disease type on tree parts and systems
3. Diagnose tree disease	3.1 Record symptoms and signs of disease according to accepted nomenclature 3.2 Collect and collate samples and evidence of disease and reference according to industry procedures 3.3 Determine the nature and severity of the disease condition 3.4 Determine disease type according to disease classification procedures 3.5 Research and identify disease according to industry standards 3.6 Prepare specimens of diseases for examination 3.7 Collect and package specimens in preparation for despatch to specialist for diagnosis and laboratory testing according to biosecurity procedures
4. Provide a prognosis	4.1 Determine the current health and vigour of the tree 4.2 Assess the severity and extent of the disease 4.3 Research the virulence of the disease on the specific host 4.4 Determine the phenology of the host and the disease 4.5 Research and consider constraints for management options 4.6 Consider influences of environmental conditions on host, disease and management options 4.7 Document prognosis and report according to workplace procedures
5. Develop, document and monitor the	5.1 Investigate and recommend management options 5.2 Develop a disease management program according to industry best

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
management program	practice 5.3 Record and document tree diseases and management programs according to workplace procedures 5.4 Monitor, review and update management plans

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	Interpret complex and technical information from scientific references to identify diseases and their virulence on host plants
Writing	Generate complex management plans for diseases, demonstrating control over a range of writing styles

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
AHCARB514 Diagnose tree diseases	AHCARB602 Diagnose tree diseases	Code changed to reflect AQF alignment Performance criteria clarified Foundation skills added Assessment requirements updated	Equivalent

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 AHCARB514 Diagnose tree diseases

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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 individual has identified and collated representative samples of at least 30 diseases of trees, including evidence of infection, into a referenced collection, including:

- 10 invertebrate pests, including insects and molluscs
- • 10 pathogenic organisms
- • 10 environmental and soil disorders.

Where biosecurity is a concern, the sample can be replaced by a high quality informative image.

There must also be evidence that the individual has:

- identified the affected tree and determined its origin and seasonal growth stages
- determined factors affecting tree health and growth, which must include:
 - current and past cultural practices
 - characteristics of growing environment
 - environmental and cultural factors that predispose trees to disease
 - assessed physical and chemical properties of the soil or growing media
- identified trees with diseases
- recognised natural defence systems for major disease types
- determined disease groups according to disease classification
- investigated trees for signs and symptoms of disease
- recorded symptoms and signs of disease using accepted nomenclature
- determined impact of disease type on tree parts and systems
- determined the nature and severity of the disease
- determined disease type
- researched and identified tree diseases
- prepared specimens of diseases for microscopic examination

- collected, packaged and prepared specimens for dispatch for specialist diagnosis or laboratory testing according to biosecurity procedures
- determined current health and vigour of the tree
- assessed severity and extent of the disease
- researched virulence of the disease on the specific host
- determined phenology of the host and the disease
- researched and considered the constraints for management options
- considered influences of environmental conditions on host, disease and management options
- documented prognosis according to workplace procedures
- investigated and recommended management options
- developed a disease management program
- recorded and documented tree diseases and management programs in a report
- monitored, reviewed and updated management plan.

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:

- definition of disease and basic concepts of plant pathology, including:
 - plant pathogens, pests and disorders
 - macro organisms, microorganisms
 - disease classification guides
 - virulence, phenology, prognosis and disease severity and extent
 - economics and tree diseases
- trees species; their growing environment and relationship to diseases, including:
 - taxonomic identification
 - tree anatomy, physiology, pathology
 - life cycle stages and characteristics of trees and their vulnerabilities
 - primary cellular and anatomical structures of trees
 - critical systems in trees and relationship to plant health, including physiological and biochemical
 - natural defence mechanisms and systems of trees
 - implications of growing season, climate and regional characteristics on tree species and disease development
 - cultural practices, including mulching, irrigation, pruning
- impact of soil or media on tree health, including:
 - chemical and physical characteristics
 - test and test results indicating tree nutrient, and growth health issues
 - controlling soil and environmental problems
- identification of signs and symptoms of tree health problems, including:

- disease detection and identification methods
- patterns of host–disease interaction for each major disease type
- nomenclature of symptoms and signs of pathogens, pests and disorders
- describing the nature and severity of disease infection, including:
 - chronic and acute
 - passive and aggressive
 - seasonal and ongoing
 - localised and unconfined
- methods for managing pathogens, pests and disorders, including:
 - mechanical control practicalities
 - chemical use, toxicity and safety, compatibility and off-target considerations
 - managing the cultural factors, growing conditions and environment
 - managing soil fertility and amelioration
 - biological control and working with natural agents to control pathogens, pests and growing environment
 - importance and use of Integrated Pest Management strategies
 - biosecurity and basic principles of hygiene in arboricultural work
- constraints to disease management, including:
 - timing and scheduling treatments
 - cost and budgetary constraints
 - perceived and real value of infected tree
- tree diseases collection and diagnosis, including:
 - collecting, preserving, securing and storing specimens and examples of tree pathogens, pests and disorders
 - biosecurity risks and mitigation when collecting and storing specimens
 - preparation of specimens for diagnostics
 - microscopic and macroscopic examinations
 - microscope slide preparation
 - methods of providing a reasoned prognosis
- horticultural function, cultural and performance requirements and characteristics of the trees or other woody plants
- processes and principles of researching tree health problems, diagnoses and remedial treatment available
- industry standards and terminology to describe disease attributes
- recording and reporting tree disease prognosis and management strategies, including:
 - written documentation
 - oral presentations.

Assessment Conditions

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

- physical conditions:
 - an arboriculture work site with the diseased trees stipulated in the performance evidence
- resources, equipment and materials:
 - computer with word processing software
 - digital imaging device
 - diagnostic tools, including sounding hammer, trowel, probe, cordless drill
 - soil testing equipment and materials
 - basic dissection microscope 10x – 100x
 - optical devices, including compound microscope, binoculars, hand lens
 - sampling equipment, secure storage containers, disinfectant
 - trees without diseases
 - trees with biotic diseases
 - trees with abiotic diseases
 - bio-secure samples of tree diseases
 - disinfection materials and equipment to minimise infections
- specifications:
 - codes of practice relevant to tree diagnostics work.

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

- arboriculture vocational competencies at least to the level being assessed
- current arboriculture industry skills directly relevant to the unit of competency being assessed.

Links

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