



Australian Government

AHCARB702 Analyse mycology cultures

Release: 1

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Modification History

Release	TP Version	Comment
1	AHCv1.0	Initial release

Application

This unit of competency describes the skills and knowledge required to safely work within a laboratory environment, collect and identify wood decay fungi specimens, prepare in vitro cultures, and carry out primary experiments.

This unit applies to individuals with advanced theoretical and technical knowledge and skills for professional or highly skilled work and/or further learning in one or more disciplines or areas of practice. This unit applies to individuals with advanced cognitive, technical and communication skills to provide specialist advice, analyse, generate and transmit solutions to complex problems, and to demonstrate autonomy, well-developed judgement, adaptability and responsibility as a practitioner or learner.

The role involves the self-directed application of specialised knowledge in arboriculture with substantial depth in areas of tree pathology and mycology.

Work is performed under standard laboratory procedures of hygiene and safety for sampling, and use, sterilisation and cleaning of standard laboratory equipment and instruments.

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

Pre-requisite Unit

Nil.

Unit Sector

Arboriculture (ARB)

Elements and Performance Criteria

Element	Performance criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Research pathogenic	1.1 Research the role of fungi in biodiversity, tree nutrition, forest

Element	Performance criteria
and saprophytic wood decay fungi species	health, environmental biochemistry and pathology 1.2 Research the role and contribution of wood decay fungi to forest health, the influence of environmental stresses and physiological tree responses 1.3 Examine the taxonomy and evolutionary relationships of corticoid and polypore wood decay fungi 1.4 Investigate the role of fungal species on various hosts 1.5 Conduct analysis of lifecycle, biology, ecology and effects of pathogenic wood decay fungi species 1.6 Conduct analysis of lifecycle, biology, ecology and effects of saprophytic wood decay fungi species 1.7 Examine the relationships of fungal species with branch and tree failures 1.8 Analyse biosecurity implications of known and threat fungal species 1.9 Review PLANTPLAN biosecurity plans and procedures
2. Evaluate decay and identify fungi	2.1 Perform visual evaluation of the signs and symptoms of fungi and decay, including: visual symptoms such as dieback, reduced growth rate and chlorosis, presence of basidiocarps, decayed wounds, hollows and cavities 2.2 Perform field identification of wood decay species of fungi to generic level 2.3 Perform field identification of non-pathogenic fungi species to generic level 2.4 Document location, size, and condition of wood decay fungi, presence of mycoparasites, and size, condition and extent of hollows and cavities 2.5 Document details of environmental characteristics of fungal affected trees: site characteristics, site history, soil conditions, climate and microclimatic variables, proximity of adjacent trees and vegetation, movement of people and vehicles, and potential impacts to assets, property and landscape 2.6 Determine methods of introduction, establishment, spread, and susceptibility of adjacent trees and vegetation 2.7 Perform field sampling techniques of wood decay fungi and mycoparasites suitable for in-vitro culture and identification
3. Prepare in-vitro media, cultures	3.1 Decant and prepare standard laboratory chemicals and materials 3.2 Create selective culturing media to grow and isolate field samples 3.3 Prepare field samples for culturing on media 3.4 Take samples from field samples and apply to growth media 3.5 Isolate clean cultures from primary field cultures, and repeat until

Element	Performance criteria
	clean sample is obtained 3.6 Prepare cultured samples for further testing such as deoxyribonucleic (DNA) based assay techniques 3.7 Document records and store securely digital and physical evidence: field samples, slides, growth media, DNA and cultured samples, following chain of evidence protocols
4. Conduct laboratory identification and assays	4.1 Prepare microscope slides of isolated cultures 4.2 Examine and identify cultured fungal samples 4.3 Perform laboratory identification of wood decay fungi to generic level 4.4 Record digital images of identified fungi 4.5 Perform laboratory assay tests for growth rate, temperature range, pathogenicity, and mycoparasitism to evaluate fungal characteristics 4.6 Document experimental assay test results 4.7 Develop and maintain a culture collection for identification of fungi and submission to relevant government databases and culture collections 4.8 Document a diagnostic report on a suspected emergency plant pest (EPP) following PLANTPLAN guidelines

Foundation Skills

Foundation Skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Unit Mapping Information

Not in unit mapping for CfE, but is used in AHC80115 - no equivalent.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72>

Assessment Requirements for AHCARB702 Analyse mycology cultures

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Performance Evidence

The candidate must be assessed on their ability to integrate and apply the performance requirements of this unit in a workplace setting. Performance must be demonstrated consistently over time and in a suitable range of contexts.

The candidate must provide evidence for and demonstrate:

- researching the role of fungi in biodiversity, tree nutrition, forest health, environmental biochemistry and pathology
- researching the role and contribution of wood decay fungi to forest health, the influence of environmental stresses and physiological tree responses
- examining the taxonomy and evolutionary relationships of corticoid and polypore wood decay fungi
- investigating the role of fungal species on various hosts
- conducting analysis of lifecycle, biology, ecology and effects of pathogenic wood decay fungi species
- conducting analysis of lifecycle, biology, ecology and effects of saprophytic wood decay fungi species
- examining the relationships of fungal species with branch and tree failures
- analysing biosecurity implications of known and threat fungal species
- reviewing PLANTPLAN biosecurity plans and procedures
- performing visual evaluation of the signs and symptoms of fungi and decay, including: visual symptoms such as dieback, reduced growth rate and chlorosis, presence of basidiocarps, decayed wounds, hollows and cavities
- performing field identification of wood decay species of fungi to generic level
- performing field identification of non-pathogenic fungi species to generic level
- documenting location, size, and condition of wood decay fungi, presence of mycoparasites, and size, condition and extent of hollows and cavities
- documenting details of environmental characteristics of fungal affected trees: site characteristics, site history, soil conditions, climate and microclimatic variables, proximity of adjacent trees and vegetation, movement of people and vehicles, and potential impacts to assets, property and landscape

- determining methods of introduction, establishment, spread, and susceptibility of adjacent trees and vegetation
- performing field sampling techniques of wood decay fungi and mycoparasites suitable for in-vitro culture and identification
- decanting and preparing standard laboratory chemicals and materials
- creating selective culturing media to grow and isolate field samples
- preparing field samples for culturing on media
- taking samples from field samples and apply to growth media
- isolating clean cultures from primary field cultures, and repeating until clean sample is obtained
- preparing cultured samples for further testing such as deoxyribonucleic (DNA) based assay techniques
- documenting records and storing securely digital and physical evidence: field samples, slides, growth media, DNA and cultured samples, following chain of evidence protocols
- preparing microscope slides of isolated cultures
- examining and identify cultured fungal samples
- performing laboratory identification of wood decay fungi to generic level
- recording digital images of identified fungi
- performing laboratory assay tests for growth rate, temperature range, pathogenicity, and mycoparasitism to evaluate fungal characteristics
- documenting experimental assay test results
- developing and maintaining a culture collection for identification of fungi and submission to relevant government databases and culture collections
- documenting a diagnostic report on a suspected emergency plant pest (EPP) following PLANTPLAN guidelines.

Knowledge Evidence

The candidate must demonstrate knowledge of:

- the role of fungi in biodiversity, tree nutrition, forest health, environmental biochemistry and pathology
- the role and contribution of wood decay fungi to forest health, the influence of environmental stresses and physiological tree responses
- taxonomy and evolutionary relationships of corticoid and polypore wood decay fungi
- the role of fungal species on various hosts
- lifecycles, biology, ecology and effects of pathogenic wood decay fungi species
- lifecycle, biology, ecology and effects of saprophytic wood decay fungi species
- relationships of fungal species with branch and tree failures
- biosecurity implications of known and threat fungal species
- PLANTPLAN biosecurity plans and procedures
- visual evaluation of the signs and symptoms of fungi and decay, including: visual symptoms such as dieback, reduced growth rate and chlorosis, presence of basidiocarps, decayed wounds, hollows and cavities
- field identification of wood decay species of fungi to generic level

- field identification of non-pathogenic fungi species to generic level
- location, size, and condition of wood decay fungi, presence of mycoparasites, and size, condition and extent of hollows and cavities
- environmental characteristics of fungal affected trees: site characteristics, site history, soil conditions, climate and microclimatic variables, proximity of adjacent trees and vegetation, movement of people and vehicles, and potential impacts to assets, property and landscape
- methods of introduction, establishment, spread, and susceptibility of adjacent trees and vegetation
- field sampling techniques of wood decay fungi and mycoparasites
- in-vitro culture of wood decay fungi and mycoparasites
- identification of wood decay fungi and mycoparasites
- methods of decanting and preparing standard laboratory chemicals and materials
- creation of selective culturing media to grow and isolate field samples
- preparation of field samples for culturing on media
- methods of sampling from field samples
- methods of application of samples to growth media
- isolation of clean cultures from primary field cultures
- methods of obtaining clean samples
- preparation of cultured samples
- deoxyribonucleic (DNA) based assay techniques
- documentation of records
- secure storage of digital and physical evidence: field samples, slides, growth media, DNA and cultured samples
- chain of evidence protocols
- preparation of microscope slides of isolated cultures
- identification of cultured fungal samples
- laboratory identification of wood decay fungi to generic level
- digital imaging of identified fungi
- laboratory assay tests for growth rate, temperature range, pathogenicity, and mycoparasitism to evaluate fungal characteristics
- documentation of experimental assay test results
- development and maintenance of culture collections
- methods of submission to relevant government databases and culture collections
- documentation of diagnostic reports
- emergency plant pest (EPP)
- PLANTPLAN guidelines.

Assessment Conditions

It is an industry requirement that competency in this unit requires the:

- field identification of a minimum of ten (10) wood decay fungi to generic level
- field identification of a minimum of ten (10) non-pathogenic fungi to generic level

- analysis of the lifecycle, biology, ecology and effects of a minimum of ten (10) saprophytic wood decay fungi species
- analysis of the lifecycle, biology, ecology and effects of a minimum of ten (10) pathogenic wood decay fungi species
- laboratory identification of a minimum of five (5) wood decay fungi to generic level.

Assessment must be demonstrated consistently over time in a suitable range of contexts and have a productivity-based outcome. No single assessment event or report is sufficient to achieve competency in this unit.

Assessment may be conducted in a simulated or real work environment, however determination of competency requires the application of work practices under work conditions.

The mandatory equipment and materials used to gather evidence for assessment include:

- equipment:
 - computer
 - word processing software
 - digital camera with macro
 - diagnostic tools including sounding hammer, trowel, probe, cordless drill
 - soil testing equipment
 - digital dissection microscope 10 -100x
 - compound microscope
 - microtome, staining and slide mounting equipment
 - slides and coverslips
 - temporary/permanent mountant
 - histochemical stains
 - laboratory equipment to perform aseptic techniques in a sterile environment
- materials:
 - emergency plant pest diagnostic report

Assessors must satisfy current standards for RTOs in the assessment of arboriculture units of competency.

Assessment must be conducted only by persons who have:

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

Links

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