



Australian Government

AHCSDT412 Perform advanced tests on seeds

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 7.0.

Application

This unit of competency describes the skills and knowledge required to perform advanced tests on seeds and grain to determine quality, performed under laboratory conditions in accordance with Australian and industry standards. Tests to be demonstrated include, Anguina test on annual ryegrass seed, endophytic seed test, electrophoresis test on a seed sample, tetrazolium test, seed vigour test and 1000 seed weight test.

The unit applies to senior seed analysts who 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. All work is carried out to comply with workplace procedures.

Seed to be processed for Certification must be sampled by an Authorised Sampler in accordance with international, federal and state seed certification regulations.

Pre-requisite Unit

Nil

Unit Sector

Seed Testing (SDT)

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. Prepare seed for testing and maintain condition and purity	1.1 Identify purpose and type of seed tests from work instructions 1.2 Verify authenticity of seed from submitted sample documentation 1.3 Verify submitted seed sample complies with condition specified

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	for seed test and report inconsistencies to supervisor 1.4 Select and implement correct personal protective equipment (PPE) 1.5 Prepare working test sample/s from submitted seed sample according to workplace and laboratory procedures 1.6 Store and maintain condition and quality of seed samples for testing according to seed species, workplace procedures and industry standards 1.7 Implement procedures to prevent contamination of submitted sample and working samples 1.8 Label and record working samples according to workplace and industry standards for traceability
2. Prepare equipment and materials for seed tests	2.1 Select number of replicates for seed test according to specified test procedure and work instructions 2.2 Prepare the required number of replicates according to specific test procedures and industry standards 2.3 Label and store replicates according to workplace procedures and industry standards 2.4 Compile and prepare materials required according to specified seed test procedures 2.5 Select, clean, check and calibrate test equipment according to manufacturer seed test specifications 2.6 Rectify or arrange repair of faulty equipment according to workplace procedures 2.7 Update records of equipment faults, repairs and calibration 2.8 Identify health and safety hazards, assess risk and implement controls according to workplace procedures
3. Implement seed testing procedures	3.1 Measure quantities of seed required for each test replicate according to test procedures 3.2 Pre-treat or condition seed replicates ready for testing according to test procedures 3.3 Conduct seed test according to seed test procedures and industry standards 3.4 Maintain conditions to maintain quality and prevent contamination of replicates during testing process 3.5 Update labelling of replicates and records according to workplace

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	and industry standards for traceability
4. Examine and assess tested seed	4.1 Identify endpoint of test and prepare replicates for assessment according to testing procedures 4.2 Examine each replicate and record observations 4.3 Assess observations against standards specified in workplace and industry procedures 4.4 Record observations and test results according to workplace and industry procedures
5. Prepare and report test results	5.1 Calculate test results according to workplace procedures and industry standards 5.2 Compile and document test results 5.3 Assess test results against standards and report results according to workplace procedures 5.4 Update records according to workplace and industry standards for traceability
6. Finalise testing procedures	6.1 Dispose of replicates and waste according to testing protocols and workplace waste and biosecurity procedures 6.2 Clean and store test equipment according to workplace procedures

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 seed testing procedures and industry standards to ensure accuracy of tests performed and integrity of tests results
Writing	Document test results accurately using industry recognised language and formatting
Numeracy	Perform calculations accurately and according to industry standards for seed testing

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
AHCSDT412 Perform advanced tests on seeds	AHCSDT403 Perform an Anguina test on annual ryegrass seed	This unit supersedes the following units: AHCSDT403 Perform an Anguina test on annual ryegrass seed, AHCSDT407 Perform an endophytic seed test, AHCSDT408 Perform an electrophoresis test on a seed sample, AHCSDT409 Perform a tetrazolium test, AHCSDT410 Perform a seed vigour test, AHCSDT411 Perform a 1000 seed weight test	Not equivalent
AHCSDT412 Perform advanced tests on seeds	AHCSDT407 Perform an endophytic seed test	This unit supersedes the following units: AHCSDT403 Perform an Anguina test on annual ryegrass seed, AHCSDT407 Perform an endophytic seed test, AHCSDT408 Perform an electrophoresis test on a seed sample, AHCSDT409 Perform a tetrazolium test, AHCSDT410 Perform a seed vigour test, AHCSDT411 Perform a 1000 seed weight test	Not equivalent
AHCSDT412 Perform advanced tests on seeds	AHCSDT408 Perform an electrophoresis test on a seed sample	This unit supersedes the following units: AHCSDT403 Perform an Anguina test on annual ryegrass seed, AHCSDT407 Perform an endophytic seed test, AHCSDT408 Perform an	Not equivalent

		electrophoresis test on a seed sample, AHCSDT409 Perform a tetrazolium test, AHCSDT410 Perform a seed vigour test, AHCSDT411 Perform a 1000 seed weight test	
AHCSDT412 Perform advanced tests on seeds	AHCSDT409 Perform a tetrazolium test	This unit supersedes the following units: AHCSDT403 Perform an Anguina test on annual ryegrass seed, AHCSDT407 Perform an endophytic seed test, AHCSDT408 Perform an electrophoresis test on a seed sample, AHCSDT409 Perform a tetrazolium test, AHCSDT410 Perform a seed vigour test, AHCSDT411 Perform a 1000 seed weight test	Not equivalent
AHCSDT412 Perform advanced tests on seeds	AHCSDT410 Perform a seed vigour test	This unit supersedes the following units: AHCSDT403 Perform an Anguina test on annual ryegrass seed, AHCSDT407 Perform an endophytic seed test, AHCSDT408 Perform an electrophoresis test on a seed sample, AHCSDT409 Perform a tetrazolium test, AHCSDT410 Perform a seed vigour test, AHCSDT411 Perform a 1000 seed weight test	Not equivalent
AHCSDT412 Perform advanced tests on seeds	AHCSDT411 Perform a 1000 seed weight test	This unit supersedes the following units: AHCSDT403 Perform an Anguina test on annual	Not equivalent

		ryegrass seed, AHCSDT407 Perform an endophytic seed test, AHCSDT408 Perform an electrophoresis test on a seed sample, AHCSDT409 Perform a tetrazolium test, AHCSDT410 Perform a seed vigour test, AHCSDT411 Perform a 1000 seed weight test	
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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 AHCSDT412 Perform advanced tests on seeds

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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 performed each of the following tests on seeds:

- tetrazolium test, including:
 - prepared seed and tetrazolium solution
 - stained seeds with a tetrazolium solution
- seed vigour test
- 1000 seed weight test, including:
 - calculated variance, standard deviation and coefficient of variance
 - determined the weight per 1000 pure seeds from a submitted sample

There must also be evidence that the individual has conducted at least one of the following tests:

- Anguina test on annual ryegrass seed, including:
 - identified galls on ryegrass seed
 - inspected seed samples using a diaphanoscope
 - used a microscope to detect nematode gall (*Anguina* spp.)
- endophytic seed test, including:
 - prepared endophyte staining solution
 - tested seed for endophyte presence
 - tested seedlings for endophyte presence
- electrophoresis test on a seed sample, including:
 - extracted seed and prepared gel
 - centrifuged seed and gel mixes
 - interpreted stain bands and patterns.

There must also be evidence that the individual has:

- verified compliance of seed sample with documentation

- selected and correctly used personal protective equipment (PPE)
- prepared and stored working sample and supplied sample to maintain quality and condition
- selected, prepared and used testing equipment and materials to conduct tests and complied with manufacturer specifications
- selected, and prepared replicates from working samples for testing
- conducted seed tests, examined tested seed, assessed and calculated test results
- maintained accurate labelling and records at each stage of the testing process for traceability according to industry and workplace standards
- cleaned test equipment, laboratory and disposed of waste according to biosecurity and workplace procedures
- disposed of replicates and waste
- updated records.

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:

- industry and workplace operating procedures for seed tests, including:
 - Anguina test on annual ryegrass seed
 - endophytic seed test
 - electrophoresis test on a seed sample
 - tetrazolium test
 - seed vigour test
 - 1000 seed weight test
 - testing equipment, setup, calibration and operation for the different seed tests
- work health, safety and environment requirements
- seed biology and relation to seed quality, condition and seed tests
- role of the International Seed Testing Association (ISTA) and the ISTA Rules for Seed Testing
- seed sampling methods, including:
 - hand samples
 - mechanical samples
 - authorised sampler and seed certification
 - preparing statistically representative replicates by weight or number of seed for testing
- federal and state agencies overseeing seed movement in Australia and sampling and testing standards, including:
 - Australian Quarantine and Inspection Service (AQIS)
 - • Organisation for Economic Co-operation and Development (OECD)
 - • Association of Official Seed Certifying Agencies (AOSCA)
 - • other certification agencies
- calculations and statistical analysis of seed test results

- personal protective equipment (PPE)
- assessment of seed test results and against industry standards and reporting results
- recordkeeping and documentation for traceability and reporting.

Assessment Conditions

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

- physical conditions:
 - skills must be demonstrated in seed testing laboratory or an environment that accurately represents workplace conditions
- resources, equipment and materials:
 - seeds of crops or pasture plants
 - use of tools and equipment to perform all tests selected in the Performance Evidence
 - use of personal protective equipment
- specifications:
 - use of sampled seed documentation
 - use of workplace policies, procedures, processes and forms for seed testing
 - use of manufacturer operating instructions for seed sampling and testing equipment
 - access to specific safety data sheets for reagents used in seed testing
 - use of workplace instructions and industry specifications for seed testing and assessment
 - access to specific seed testing and certification regulations and industry practice
- relationships:
 - supplier of seed for testing
 - supervisor(s)
- timeframes:
 - according to seed testing times specified in testing procedures.

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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