SOUTH AFRICAN QUALIFICATIONS AUTHORITY

REGISTERED UNIT STANDARD:

Demonstrate a basic understanding of the physiological processes in plant growth and development

SAQA US ID	UNIT STANDARD TITLE			
116295	Demonstrate a basic understanding of the physiological processes in plant growth and development			
ORIGINATOR	**ORIGINATING PROVIDER**			
SGB Primary Agriculture				
QUALITY ASSURING BODY				
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FIELD			**SUBFIELD**	
Field 01 - Agriculture and Nature Conservation			Primary Agriculture	
ABET BAND	**UNIT STANDARD TYPE**	**OLD NQF LEVEL**	**NEW NQF LEVEL**	**CREDITS**
Undefined	Regular	Level 4	NQF Level 04	3
REGISTRATION STATUS		**REGISTRATION START DATE**	**REGISTRATION END DATE**	**SAQA DECISION NUMBER**
Reregistered		2009-07-01	2012-06-30	SAQA 0480/09
LAST DATE FOR ENROLMENT		**LAST DATE FOR ACHIEVEMENT**		
2013-06-30		2016-06-30		

In all of the tables in this document, both the old and the new NQF Levels are shown. In the text (purpose statements, qualification rules, etc), any reference to NQF Levels are to the old levels unless specifically stated otherwise.

This unit standard does not replace any other unit standard and is not replaced by any other unit standard.

PURPOSE OF THE UNIT STANDARD

The learner will be able to identify the different physiological processes involved in growth and development of a plant.

Learners will gain specific knowledge and skills in plant physiology and anatomy and will be able to operate in a plant production environment implementing sustainable and economically viable production principles.

They will be capacitated to gain access to the mainstream agricultural sector, in plant production, impacting directly on the sustainability of the sub-sector. The improvement in production technology

will also have a direct impact on the improvement of agricultural productivity of the sector.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

It is assumed that a learner attempting this unit standard will show competence against the following unit standards or equivalent:

- NQF 3: Demonstrate a basic understanding of the physiological functioning of the anatomical structures of the plant.
- NQF 3: Incorporate basic concepts sustainable farming systems into practical farm activities.

UNIT STANDARD RANGE

Whilst range statements have been defined generically to include as wide a set of alternatives as possible, all range statements should be interpreted within the specific context of application.

Range statements are neither comprehensive nor necessarily appropriate to all contexts. Alternatives must however be comparable in scope and complexity. These are only as a general guide to scope and complexity of what is required.

Specific Outcomes and Assessment Criteria:

SPECIFIC OUTCOME 1

Demonstrate an understanding of the processes involved in cell division with relation to growth and development of the plant.

OUTCOME RANGE

Cell division refers to the process of mitosis. Growth and development refers to the development of secondary vascular bundles.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The process of mitosis is described.

ASSESSMENT CRITERION RANGE

Refers to the process of cell division.

ASSESSMENT CRITERION 2

Secondary growth in plants with reference to the development of secondary vascular tissue and growth of a plant is explained.

ASSESSMENT CRITERION RANGE

Secondary vascular tissue refers to secondary xylem and phloem development.

ASSESSMENT CRITERION 3

Cell division with reference to a) germination, b) pollination, and c) fertilization is explained.

SPECIFIC OUTCOME 2

Describe the process of transpiration and its role in water uptake by a plant.

OUTCOME RANGE

Water uptake refers to but it is not limited to the process of osmosis and translocation.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The concept of osmosis and how it occurs is explained.

ASSESSMENT CRITERION 2

Osmosis is illustrated.

ASSESSMENT CRITERION 3

The movement of water from the root to the leaves is explained and illustrated.

ASSESSMENT CRITERION 4

The role of the stomata with reference to transpiration is explained.

ASSESSMENT CRITERION 5

The role of transpiration in relation to water use efficiency of the plant is explained.

ASSESSMENT CRITERION 6

The concept of wilting is explained.

SPECIFIC OUTCOME 3

Describe the process of respiration in relation to gaseous exchange in the plant.

OUTCOME RANGE

Gaseous exchange refers to but is not limited to osmosis and respiration.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The transfer of gases between the plant and its external environment is described.

ASSESSMENT CRITERION 2

The process of respiration and when it occurs in plants is explained.

ASSESSMENT CRITERION 3

The process of respiration in relation to climacteric and non-climacteric fruit is described.

ASSESSMENT CRITERION 4

The influences of respiration on the ripening of fruit are discussed.

SPECIFIC OUTCOME 4

Demonstrate an understanding of the process of photosynthesis.

OUTCOME RANGE

Photosynthesis refers to the process that occurs in green plants. Photosynthesis is the process by which complex molecules are produced from plant nutrients, water and gases through a physiological process.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The effect environmental factors have on the process of photosynthesis is demonstrated and explained.

ASSESSMENT CRITERION 2

The light phase of photosynthesis is discussed and described.

ASSESSMENT CRITERION 3

The dark phase of photosynthesis is discussed and described.

SPECIFIC OUTCOME 5

Demonstrate an understanding of the maturity and ripening of fruit.

OUTCOME RANGE

Maturity and ripening refers to but is not limited to cell division, respiration, etc.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The process of cell division and differentiation in fruit is explained.

ASSESSMENT CRITERION 2

The role of ethylene in fruit maturity and ripening is explained.

ASSESSMENT CRITERION 3

The function of ethylene in the manipulation of fruit ripening and harvesting is explained.

ASSESSMENT CRITERION 4

The storage of fruit is explained with reference to ethylene and atmospheric factors.

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

The assessment of qualifying learners against this standard should meet the requirements of established assessment principles.

It will be necessary to develop assessment activities and tools, which are appropriate to the contexts in which the qualifying learners are working. These activities and tools may include an appropriate combination of self-assessment and peer assessment, formative and summative assessment, portfolios and observations etc.

The assessment should ensure that all the specific outcomes; critical cross-field outcomes and essential embedded knowledge are assessed.

The specific outcomes must be assessed through observation of performance. Supporting evidence should be used to prove competence of specific outcomes only when they are not clearly seen in the actual performance.

Essential embedded knowledge must be assessed in its own right, through oral or written evidence and cannot be assessed only by being observed.

The specific outcomes and essential embedded knowledge must be assessed in relation to each other. If a qualifying learner is able to explain the essential embedded knowledge but is unable to perform the specific outcomes, they should not be assessed as competent. Similarly, if a qualifying learner is able to perform the specific outcomes but is unable to explain or justify their performance in terms of the essential embedded knowledge, then they should not be assessed as competent.

Evidence of the specified critical cross-field outcomes should be found both in performance and in the essential embedded knowledge.

Performance of specific outcomes must actively affirm target groups of qualifying learners, not unfairly discriminate against them. Qualifying learners should be able to justify their performance in

terms of these values.

- Anyone assessing a learner against this unit standard must be registered as an assessor with the relevant ETQA.

- Any institution offering learning that will enable achievement of this unit standard or assessing this unit standard must be accredited as a provider with the relevant ETQA.

- Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

The person is able to demonstrate a basic knowledge of:

- Transpiration, respiration and photosynthesis.
- Gaseous exchange, osmosis and translocation.
- Cell division.
- Laws of nature.

UNIT STANDARD DEVELOPMENTAL OUTCOME

N/A

UNIT STANDARD LINKAGES

N/A

Critical Cross-field Outcomes (CCFO):

UNIT STANDARD CCFO IDENTIFYING

Problem Solving: Relates to all outcomes.

UNIT STANDARD CCFO WORKING

Teamwork: Relates to all outcomes.

UNIT STANDARD CCFO ORGANISING

Self-Management: Relates to all outcomes.

UNIT STANDARD CCFO COLLECTING

Interpreting Information: Relates to all outcomes.

UNIT STANDARD CCFO COMMUNICATING

Communication: Relates to all outcomes.

UNIT STANDARD CCFO SCIENCE

Use Science and Technology: Relates to all outcomes.

UNIT STANDARD CCFO DEMONSTRATING

The world as a set of related systems: Relates to all outcomes.

UNIT STANDARD CCFO CONTRIBUTING

Self-development: Relates to all outcomes.

QUALIFICATIONS UTILISING THIS UNIT STANDARD:

	ID	QUALIFICATION TITLE	OLD LEVEL	NEW LEVEL	STATUS	END DATE	QUALITY ASSURING BODY
Core	49009	National Certificate: Plant Production	Level 4	New Level Assignment Pend.	Reregistered	2012-06-30	AgriSETA

PROVIDERS CURRENTLY ACCREDITED TO OFFER THIS UNIT STANDARD:

This information shows the current accreditations (i.e. those not past their accreditation end dates), and is the most complete record available to SAQA as of today. Some Quality Assuring Bodies have a lag in their recording systems for provider accreditation, in turn leading to a lag in notifying SAQA of all the providers that they have accredited to offer qualifications and unit standards, as well as any extensions to accreditation end dates. The relevant Quality Assuring Body should be notified if a record appears to be missing from here.

NONE
