



**education**

Department:  
Education  
REPUBLIC OF SOUTH AFRICA

# **NATIONAL CERTIFICATE (VOCATIONAL)**

## **SUBJECT GUIDELINES**

### **PLANT PRODUCTION**

#### **NQF Level 3**

September 2007



# **PLANT PRODUCTION**

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## INTRODUCTION

### **A. What is Plant Production?**

Plant Production is a Vocational subject in the Primary Agriculture programme of the National Certificates (Vocational). Plant Production deals with the physiology and anatomy of plants and the establishment of vegetable and agronomic crops and fruits (subtropical and deciduous). The subject covers establishment practices, cultivation, crop management principles, harvesting and post-harvest storage.

### **B. Why is Plant Production important in the Primary Agriculture programme?**

Plant Production is one of the NQF Level 2 to 4 Vocational subjects in the National Certificates (Vocational). Students studying and gaining competence in this subject will fulfil one of the pass requirements in the Primary Agriculture qualification. Gaining skills and techniques in the establishment and management of crops and fruits creates better employment or self-employment opportunities for students when they have completed the programme. It further enables students to enter into higher education.

### **C. The link between the Plant Production Learning Outcomes and the Critical and Developmental Outcomes**

The Learning Outcomes in Plant Production assist students to achieve the Critical and Developmental Outcomes. All the Plant Production Learning Outcomes relate to and promote the following outcomes: self organisation, communication, self development, teamwork, problem-solving, science, technology and information gathering and evaluation.

### **D. Factors that contribute to achieving Plant Production Learning Outcomes**

The following factors will assist students to achieve the Plant Production Learning Outcomes:

- Enabling environment – Plant Production should be presented in a context of small and medium enterprises (SMMEs), emerging small-scale farmers and personal needs.
- Resources – Students must have access to all the necessary resources depending on the task.
- Experiential exposure – Students must be exposed to practical and appropriately simulated work environments.
- Suitably qualified lecturers – Lecturers should be well informed about legislation, community issues and available support systems from, for example the Departments of Agriculture and Environmental Affairs. They should also possess technical knowledge of Plant Production.

## 1 DURATION AND TUITION TIME

This is a one year instructional programme comprising 200 teaching and learning hours. This is a fulltime subject however it may be offered on a part time basis to people already employed in a farming industry as long as all the promotional and assessment requirements are met.

Provision for students with special education needs (LSEN) will be made by colleges offering the qualification. This will help to eliminate barriers to learning.

## 2 SUBJECT LEVEL FOCUS

- Demonstrate an understanding of crop production

## 3 ASSESSMENT REQUIREMENTS

### 3.1 Internal assessment (50 percent)

#### 3.1.1 Theoretical component

The student will be required to achieve all outcomes of this subject at this level. Assessment of all topics in this subject will contribute to the formative assessment of the course. The theoretical component forms 40 percent of the internal assessment mark.

#### 3.1.2 Practical component

The practical component forms 60 percent of the internal assessment for this subject at this level. The outcomes that are addressed in this assessment must be clearly indicated.

All practical learning activities must be recorded in the Portfolio of Evidence for each student. This can be used as part of continuous assessment

Practical activities may include case studies, assignments, integrated activities, knowledge tests, group work and group exercises, discussions, research projects, presentations (lectures, demonstrations, group discussions and activities, practical work, observation, role play and self activities), use of aids, visits, guest speaker presentations, practical experiential training and workplace practical, excursions.

- **Some examples of practical assessments include, but are not limited to:**

- Presentations (practical work, observation, role play, self activity, judging and evaluation)
- Field tests
- Research
- Structured environment

- **Definition of the term “Structured Environment”**

“Structured environment” for the purposes of assessment refers to an actual or simulated workplace, or workshop environment.

Evidence of this practical component must be provided in the form of a Logbook with a clear listing of the competencies to be assessed. The following information must be contained in the logbook:

- Field tests (objective, when and how they were done)
- Soil science activities
- Name of a student
- Place where the practical component was achieved
- List of outcomes to be achieved in the environment (tasks, tests)
- Time period spent on the activity
- Comment on the outcomes
- Student signature, facilitator’s or supervisor’s signature.

For the Logbook to be regarded as valid evidence it must be signed off by an officially assigned supervisor and by the student.

### • Evidence in practical assessments

All evidence pertaining to evaluation of practical work must be reflected in the students' Portfolio of Evidence. The tools and instruments constructed and used for the purpose of conducting such assessments must be clear from evidence contained in the PoE.

#### 3.1.3 Processing of internal assessment mark for the year

A year mark out of 100 is calculated by adding the marks of the theoretical component and the practical component of the internal continuous assessment.

#### 3.1.4 Moderation of internal assessment mark

Internal assessment is subjected to both internal and external moderation procedures as contained in the *National Examinations Policy for FET College Programme*.

### 3.2 External assessment (50 percent)

A national examination is conducted annually in October or November by means of a paper/s set externally and marked and moderated externally

Details in respect of external assessment are contained in the *Assessment Guidelines: Plant Production (Level 3)*.

## 4 WEIGHTED VALUES OF TOPICS

TOPICS	WEIGHTED VALUE
1. Production of agronomic crops and fruits	100%
<b>TOTAL</b>	<b>100</b>

## 5 CALCULATION OF FINAL MARK

Continuous assessment: Student's mark/100 x 50 = a mark out of 50 (a)

Examination mark: Student's mark/100 x 50 = a mark out of 50 (b)

**Final mark: (a) + (b) = a mark out of 100**

All marks are systematically processed and accurately recorded to be available as hard copy evidence for, amongst others, purposes of moderation and verification.

## 6 PASS REQUIREMENTS

The student must obtain at least fifty (50) percent in ICASS and fifty (50) percent in the examination.

## 7 SUBJECT AND LEARNING OUTCOMES

On completion of Plant Production Level 3 the student should have covered the following topic:

Topic 1: Production of agronomic crops, fruit trees and agroforestry systems.

### 7.1 Topic 1: Production of agronomic crops, fruit trees and agroforestry systems.

**7.1.1 Subject Outcome 1:** Explain characteristics of good cultivars in relation to their suitability in terms of prevailing climatic and soil conditions.

*Range: Cultivars refer to fruit trees, agronomic crops and trees suitable for agroforestry.*

#### Learning Outcome

- List characteristics of good cultivars (fruit trees, agronomic crops and trees suitable for agroforestry).
- Describe the interaction of crops with trees in agroforestry methodologies.

**7.1.2 Subject Outcome 2:** Describe, using examples, procedures followed when preparing the soil for planting (agronomic crops, fruit trees and trees suitable for agroforestry). Identify fertilizer and water

requirements for crops and trees grown separately or in agroforestry systems when the latter does or does not include leguminous trees or crops.

**Learning Outcome**

- Describe with examples soil preparation procedures.
- Describe types of fertilizer required for a particular crop and the application methods.
- Describe inter and intra-row spacing in order to perform planting appropriately
- Describe the harvesting in agroforestry systems and the use of agroforestry trees as animal feed and soil mulching.
- List the benefits and problems of agroforestry systems on 2 ha plots.

**7.1.3 Subject Outcome 3:** Explain reproduction of fruit trees from rootstocks/scion and agronomic crops from seeds.

**Learning Outcome**

- Identify suitable rootstocks and scions for different trees (citrus, deciduous, agroforestry)
- Describe the characteristics of different rootstocks and scions.
- Discuss the correct seeds/seedlings for the production of agronomic crops.

**7.1.4 Subject Outcome 4:** Identify, using examples, the irrigation requirements of agronomic crops and trees

**Learning Outcome**

- Describe irrigation requirements of a crop.
- Apply irrigation methods in order to fulfill the water requirements.

**7.1.5 Subject Outcome 5:** Identify and describe different types of pest and disease.

**Learning outcome**

- Characteristics of pests and diseases and their damage characteristics are described using examples.

**7.1.6 Subject Outcome 6:** Control pests and diseases using correct control measures.

**Learning Outcome**

- Biological control, chemical control and physical control are explained in order to select the best control method or combination of integrated control methodologies.

**7.1.7 Subject Outcome 7:** List and describe with examples the control and preventative measures for pests and diseases.

**Learning Outcome**

- Chemical and biological control and Integrated measures are described and applied

**7.1.8 Subject Outcome 8:** Identify and explain with examples the indications of fruit ripeness or crop maturity in order to perform harvesting.

**Learning Outcome**

- Describe with examples the indications of fruit ripeness or crop maturity In order to perform harvesting.
- Describe methods of harvesting of at least three different crops.
- Describe and discuss the post-harvest treatment of crops and on-farm storage.

**7.1.9 Subject Outcome 9:** Describe crop rotation and mulching.

**Learning Outcome**

- Describe the application and significance of crop rotation in sustainable agricultural enterprise
- Describe the importance of mulching in sustainable farming enterprise.

## 8 RESOURCE NEEDS FOR THE TEACHING OF PRIMARY AGRICULTURE

### 8.1 Phased development of training and demonstration farm

The following is a summarised phased development approach that is suggested for the establishment of a training and demonstration farm mainly for the NCV programme. It is suggested that the development of the programme be done in phases. Staff appointment has not been included

- **Phase 1:**
  - Farm layout or land use planning
  - Bush clearing on cropland
- **Phase 2:**
  - Build, equip and stock the broiler unit
  - Build, equip and stock the egg layer unit
  - Install irrigation reticulation
  - Establish vegetable field crops and seedling units
  - Establish a beekeeping unit
  - Erect external security fence
- **Phase 3**
  - Establish pastures
  - Erect internal fences and allocate grazing camps
- **Phase 4**
  - Build, equip and stock dairy, beef, goat and pig units
  - Extend training courses

### 8.2 Resource needs training and demonstration

<b>FARM INFRASTRUCTURE</b>	
1. BROILER PRODUCTION AND PROCESSING UNIT	<ul style="list-style-type: none"> <li>• Building costs: 5 x 57.5m<sup>2</sup></li> <li>• Equipment (brooders, drinkers, tube feeders)</li> <li>• Complete broiler processing equipment</li> </ul>
2. LAYER AND EGG PROCESSING UNIT	<ul style="list-style-type: none"> <li>• Building costs: 1 x 64m<sup>2</sup></li> <li>• Equipment (includes cages)</li> <li>• 500 point of lay 20 week old pullets</li> </ul>
3. DAIRY AND MILK PROCESSING UNIT	<ul style="list-style-type: none"> <li>• Buildings</li> <li>• Equipment for milking and milk processing</li> <li>• 12 heifers</li> </ul>
4. BEEF UNIT	<ul style="list-style-type: none"> <li>• Sheltered beef feedlot unit: 1 x 30m</li> <li>• Beef handling pens and equipment</li> <li>• 12 Nguni heifers</li> <li>• 1 Nguni bull</li> </ul>
5. GOAT UNIT	<ul style="list-style-type: none"> <li>• 20 young nanny goats</li> <li>• 2 quality breeding billy goats</li> <li>• Goat handling pens and equipment</li> </ul>
6. PIG UNIT	<ul style="list-style-type: none"> <li>• Buildings</li> <li>• Equipment (brooders, farrowing rails, troughs)</li> <li>• 8 gilts and 2 boars</li> </ul>
7. APIARY UNIT	<ul style="list-style-type: none"> <li>• Apiary equipment including honey extractor</li> </ul>
8. ESTABLISHED PASTURES	<ul style="list-style-type: none"> <li>• Land preparation, fertilisation planting 8ha</li> </ul>
9. IRRIGATION	<ul style="list-style-type: none"> <li>• 1ha vegetables, 4ha maize/beans and 8ha pastures</li> <li>• Rising main from the river to reservoir and gravity flow (lower lands, paddocks) or booster pump (upper lands)</li> </ul>



10. FARM TOOLS AND AGROCHEMICALS	<ul style="list-style-type: none"> <li>• Equipment (hand tools, knapsacks, mower, wheelbarrows, spades etc.)</li> <li>• Farm shed</li> </ul>
11. SEEDLING NURSERY (Vegetables, trees, shrubs)	<ul style="list-style-type: none"> <li>• Shadecloth, poles, standpipes, equipment</li> </ul>
12. WATER RETICULATION	<ul style="list-style-type: none"> <li>• Reticulation to paddocks, livestock units</li> </ul>
13. VEHICLES	<ul style="list-style-type: none"> <li>• 1 tonne pick up and canopy</li> <li>• 1 medium size tractor</li> <li>• 1 mini bus for transporting learners</li> <li>• Tractor trailer and implements</li> </ul>
14. FENCING	<ul style="list-style-type: none"> <li>• External security fence: 2 km</li> <li>• Internal fences: 1.6km</li> </ul>
15. MISCELLANEOUS	<ul style="list-style-type: none"> <li>• Laboratory with equipment for plant and soil science</li> <li>• Laboratory with equipment for animal &amp; poultry science</li> <li>• Teaching aids (data projectors, screen, DVD player etc.)</li> <li>• Computers with internet links</li> <li>• Library with relevant books and magazines</li> </ul>