higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

PLANT PRODUCTION
NQF LEVEL 2

12 November 2024

This marking guideline consists of 8 pages.

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SECTION A

QUESTION 1

1.1	1.1.1	True		
	1.1.2	False		
	1.1.3	True		
	1.1.4	True		
	1.1.5	True		
	1.1.6	True		
	1.1.7	True		
	1.1.8	False		
	1.1.9	True		
	1.1.10	False		
			10 × 1)	(10)
1.2	1.2.1	Transpiration		
	1.2.2	Phloem		
	1.2.3	Reproduction		
	1.2.4	Stomatal pores		
	1.2.5	Nectar		
	1.2.6	Petiole		
	1.2.7	Auxiliary		
	1.2.8	Organs		
	1.2.9	Maturity index		
	1.2.10	Molecules		
			(10 × 1)	(10)
1.3	1.3.1	B		
	1.3.2	F		
	1.3.3	M		
	1.3.4	J		
	1.3.5	G		
	1.3.6	A		
	1.3.7	D		
	1.3.8	I		
	1.3.9	E		
	1.3.10	C		
			(10 × 1)	(10)
				[30]

TOTAL SECTION A: 30

SECTION B

QUESTION 2

2.1 2.1.1

- Soil type
- Drainage of the soil
- Water quality
- Topography
- Annual rainfall (5)

2.1.2

- Sprinkler irrigation
- Drip irrigation
- Mechanised irrigation
- Bed irrigation
- Flood irrigation
- Furrow irrigation (Any 3 × 1) (3)

2.1.3

Irrigation method	Advantages	Disadvantages
Sprinkler system	• Can be used on uneven land • Loss of water is minimum • Conserve water • Reduces labour costs • Suitable for almost all soil types • Does not interfere with cultivation • Uniform water distribution • Prevents soil erosion • Leads to fewer weeds (Any ONE)	• Expensive • Leads to higher evaporation • Land cannot be worked while sprinkler is active (Any ONE)
Drip irrigation	• Saves water • Easy to control pests and diseases • Prevents disease by minimising water contact with the leaves, stems and fruit of plants	• Expensive • Nozzles are very small; they often get blocked (Any ONE)

	• Allows the rows between plants to remain dry, which improves access and reduces weed growth • Saves time, money and water because the system is so efficient • Decreases labour (Any ONE)	•
Furrow irrigation	• Initial capital layout is cheap	• Requires a lot of water • Excessive water intake and deep percolation losses • Causes soil erosion and water pollution • Greater labour costs • Lower application efficiency (Any ONE)

(3 × 2) (6)

2.2 2.2.1 Evapotranspiration is the amount water lost from the plants✓ and the amount of water evaporated from the soil.✓ (2)

2.2.2
- Evaporation pan
- Tensiometer
- Moisture neutron probe
- Electric water sensor

(2)

2.3
- Hand harvesting
- Hand tools
- Mechanical

(3)

2.4

HARVESTING METHOD	ADVANTAGE
Hand harvesting	• No damage on the product • Fruits and vegetables can be selected more precisely
Hand tools	• Cheap • Tools designed for harvesting minimise crop damage • Reduce manual labour and make tasks quicker and more manageable
Mechanical	• Faster/Accelerate harvesting • Reduces harvest costs • Uses labour force effectively

(Any 3 × 1) (3)

2.5
- Freshness
- Mass
- Moisture content
- Size of the vegetable
- Sugar level
- Acid level
- Ripeness (Any 4 × 1) (4)

2.6
- Municipal fresh market
- Direct to customers
- Retail stores
- Wholesalers
- Farm stall (Any 4 × 1) (4)

2.7 2.7.1
- Plastic bags
- Cardboard boxes
- Mesh bags
- Shrink wrap
- Vacuum packaging
- Crates and containers
- Wax packaging (Any 5 × 1) (5)

2.7.2
- Protecting and preserving
- Preparing the product for transportation
- Easy to store
- Preparing the products for marketing (Any 3 × 1) (3)

[40]

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QUESTION 3

3.1 3.1.1 Crop rotation (1)

3.1.2 Crop rotation is the practice of growing a series of different crops on the land in a specific order. (2)

3.1.3
- The main crop for the rotation should be selected with care and should be suited to the region's soil and climate.
- The rotation should include crops that permit the frequent use of the cultivator and the hoe, so weeds can be destroyed.
- The rotation should include adding kraal manure or compost to the soil to maintain soil fertility.
- The rotation should include a legume, because legumes improve the nitrogen content in the soil.
- Deep-rooted and shallow-rooted crops should be planted alternatively, because they draw food from different levels in the soil.
- Crops of the same family/habit of growth should not follow one another; they should be separated by crops with different growth habits. (Any 5 × 2)

(10)

3.2 3.2.1
- Broad leaf type
- Grass type
- Bulb type

(3)

3.2.2 Selective weed killer is a chemical that kills weed without affecting the cultivated crops. (2)

3.2.3
- Absorb water
- Absorb nutrients
- Affect plant growth
- Reduce production
- Harbour pests
- Lead to poor quality of the produce
- Smother young plants
- Compete with plants for sunlight (Any 5 × 1) (5)

3.3 3.3.1 Residual spray is sprayed in the soil before sowing the seed. It stays active in the soil, and when the weed seeds start to germinate, they die.

3.3.2 Contact spray kills weed when the chemical touches the part of the plant.

3.3.3 Systemic spray is sprayed onto the leaves of a plant. The poison travels through the whole body of the plant.

(3 × 2) (6)

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3.4
- Proper soil preparation – soil preparation should be done before planting to remove weeds and debris
- Mulching the soil – applying a thick layer of organic mulch to supress weed growth
- Crop rotation – rotate crops to break the weed cycle and improve soil fertility
- Hand weeding – removing weeds by hands
- Use cover crops – plant cover crops that outcompete weeds for resources such as light
- Adjust irrigation − to avoid overwatering, which can encourage weed growth (6)

3.5
- Sanitation – removing infested plants or debris
- Planting resistant cultivars
- Planting date – avoid planting during peak weevil activity
- Biological controls
- Proper grain storage
- Fumigation
- Good penetration of gas (Any 5 × 1) (5)

[40]

QUESTION 4

4.1 4.1.1 Hydroponics (1)

4.1.2
- Good-quality crops – allows precise control over nutrient levels, resulting in higher-quality crops
- High productivity – increased crop yield compared to soil-based farming
- Controlled environmental conditions – when it gets hot inside, vents are opening to cool down the tunnel
- Easy to spot infected plants – plants are not overcrowded and free from weeds, which make it easier to identify plants infested by pests or diseases
- Reduced land use – can be used in small spaces, making it ideal for urban areas or areas with limited arable land
- Year-round production – allows for year-round production regardless of weather conditions
- Reduced soil erosion – eliminates the need of tilling, reducing soil erosion and preserving top soil
- Reduced labour costs – many tasks can be automated, reducing labour costs and improving efficiency (Any 5 × 2) (10)

4.1.3
- Fertigation
- Micro spray
- Overhead spray/sprinkler (Any 2 × 1) (2)

4.2 4.2.1 Plant morphology is the study of the physical form✓ and external structure of plants,✓ whereas plant anatomy is the study of the internal plant structure,✓ mostly at the cellular/microscopic level.✓ (4)

4.2.2
- Roots
- Stem
- Leaves
- Branches
- Flowering
- Fruit set

(Any 5 × 1) (5)

4.2.3
- Aspect
- Light
- Water
- Temperature
- Rainfall patterns (5)

4.3
- Irrigation
- Disease control
- Weeding
- Pruning
- Fertilising (5)

4.4 4.4.1
- No bright colours, special odours or nectar
- Small
- Most have no petals
- Stamens and stigmas are exposed to air currents
- Large amount of pollen
- Pollen smooth, light and easily airborne
- Stigma feathery to catch pollen from wind (Any 4 × 1) (4)

4.4.2
- Harsh weather conditions
- Use of chemicals kills pollinators
- Invasive species
- Habitat loss

(4 × 1) (4)
[40]

TOTAL SECTION B: 120
GRAND TOTAL: 150

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