higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ADVANCED PLANT PRODUCTION
NQF LEVEL 4

XX February 2020

This marking guideline consists of 7 pages.

QUESTION 1

1.1
1.1.1 Sexual reproduction
1.1.2 Terminal bud
1.1.3 Rhizome
1.1.4 Cuttings/Slips
1.1.5 Radicle
1.1.6 Adventitious roots
1.1.7 Integument
1.1.8 Carpel
1.1.9 Petals
1.1.10 Fertigation

(10 × 1) (10)

1.2
1.2.1 E
1.2.2 C
1.2.3 F
1.2.4 A
1.2.5 B
1.2.6 D
1.2.7 O
1.2.8 G
1.2.9 I
1.2.10 H

(10 × 1) (10)

1.3
1.3.1 Sub-irrigation supplies water from a reservoir to the bottom,✓ while drip-irrigation supplies water to individual containers near the growing substrate surface where it infiltrates quickly.✓

1.3.2 Rhizomes are thickened underground stems that grow more or less parallel to the soil,✓ while runners are side shoots with very long internodes that develop roots when it touches the ground.✓

1.3.3 Suckers are rooted shoots growing from below the ground next to parent plants,✓ while bulbils are tiny bulbs produced from above the ground.✓

1.3.4 Manure is organic fertiliser made from waste material of animals,✓ while compost is organic fertiliser made from waste material of plants, animals and any other decayed material.✓

1.3.5 Annuals complete their life circle in one growing season,✓ while perennials complete their growth cycle in two seasons.✓

(5 × 2) (10)
[30]

QUESTION 2

2.1 Dormancy can be broken by soaking seeds in a bowl of water for a period of a few hours to a week.✓✓ Another way is by scarifying a seed, which is to make a small cut on the seed coat where water will enter so that seed will start to germinate. Making the small cut should be done very carefully to not injure the hilum.✓✓ (2 × 2) (4)

2.2
- Enables access✓ to the plants and trims unwanted growth✓
- Enables observation✓ of insect and disease infestation easily✓
- Makes preventative✓ and control measures possible✓ (3 × 2) (6)

2.3
- Cytokinins✓ – increase resistance to extreme temperature and disease.✓
- Auxins✓ – heal plant injury and promote root formation.✓
- Gibberellins – enable germination of seeds and lengthening of stems but not roots.✓
- Ethylene✓ – helps to ripen fruit.✓
- Abscisic acid✓ – plays a role in seed development, maturation and dormancy.✓ (5 × 2) (10)

2.4
- Dividing
- Cutting
- Layering
- Grafting
- Budding (Any 4 × 1) (4)

2.5 2.5.1
- Stem
- Leaf
- Root (3)

2.5.2
- Woody plants
- Herbaceous plants
- Fruit trees
- Shrubs (Any 3 × 1) (3)

[30]

QUESTION 3

3.1 3.1.1
- FIGURE 1: Whip and tongue
- FIGURE 2: Apical wedge (2)

3.1.2 A:
- Rootstock is part of a plant, often an underground part, from which new above-ground growth can be produced.
- It is a stem with a well-developed root system used for grafting a bud from another plant.
- In grafting it is an established healthy root system onto which a cutting or a bud from another plant is grafted.

B: The scion✓ is the part of the upper part that grows on the root and when grafted the plant will produce the shoots.✓
(Any 2 × 2) (4)

3.1.3
- Grafting knife
- String or plastic tape and sealing wax (2)

3.1.4 FIGURE 1:
- Make a sloping cut in the rootstock with a tongue pointing up.
- Make a matching cut in the scion with a tongue facing down.
- Join the two, ensuring maximum contact of the cambium layers.
- Bind with tape and seal with grafting wax. (4)

3.1.5
- Sharp and sterilised knife
- Disinfected hands
- Clean protective clothes (3)

3.1.6
- -Select a low branch which can be bent to the ground
- -Make a cut halfway through the stem.
- -Dust some rooting hormones on the cut.
- -Place the branch in a prepared bed alongside parent plant, cover with few cm of soil
- -Bend tip upwards and secure the layer with a wire hairpin or wood 'v' stick
- -Keep the ground moist (6)

3.2 3.2.1 Dibber and trowel (2)

3.2.2 A dibber is used to open a hole to insert the plant,✓ while a trowel is used to fill the container with a growth medium.✓ (2)

3.2.3
- Disease, like a fungus, less likely to spread to all other plants
- Allows for portability
- Variety of containers allows the farmer to design the interior of the nursery in a way that fits individual needs (3)

3.2.4
- Easy to spread disease
- Lot of effort, e.g. preparing the soil (2)

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QUESTION 4

4.1 Flower cultivars are plants that are selected and carefully bred for desirable characteristics maintained during propagation. (2)

4.2
- Roses
- Camellias
- Daffodils
- Azaleas
- Gerberas or any other applicable answer (Any 3 × 1) (3)

4.3
- Improved yield and fragrance
- Resistance to disease and pests
- Water and drought resistant
- Enhanced quality
- Inherit the characteristics of the parent plant popular with consumer
- Vigorous growth (Any 4 × 1) (4)

4.4
4.4.1 Aphids
4.4.2 Spider mites
4.4.3 Snails and slugs
(3 × 1) (3)

4.5 4.5.1 Predators hunt✓ and feed✓ on pests, while parasites develop✓ inside or on a pest and then they consume✓ the pest as they grow.
(2 × 2) (4)

4.5.2
(a) Encourage plant pollination
(b) Feed on slugs, snails, caterpillars, cutworms, moth larvae and small insect pests
(c) Although their hatched eggs – as caterpillars – will damage crops, butterflies do little harm and help to pollinate many flowers
(d) Eat/feed on caterpillars, slugs and other pests and help break down decaying garden waste
(e) Create topsoil by depositing their mineral-rich castings back into the earth
(5 × 1) (5)

4.6 Nursery hygiene and plant health includes proper weed control✓ and the sanitation of soil.✓ Workers should be careful not to transport diseases from one place to another by clothing – especially shoes should be regularly changed✓ or washed and disinfected.✓ (4)

4.7
- Method used
- Application volume
- Pesticide used
- Concentration applied
- Active ingredient
- Number of applications
- Application type
- Weather information (Any 5 × 1) (5)

[30]

QUESTION 5

5.1 5.1.1
- Biological control is a method of controlling pests such as insects, mites, weeds and plant diseases using other organisms. It relies on predation, parasitism, herbivores or other natural mechanisms and also involves an active human.
- Cultural control is the management of pests (insects, diseases, weeds) by manipulation of the environment or implementation of preventive practices. (2 × 2) (4)

5.1.2
- Sanitation✓ means that residual populations of pests are removed from crops, often during winter.
- Planting and harvesting dates✓ can be altered to avoid coincidence with periods of high pest activity.
- Crop rotation✓ is particularly effective against soil pests and displaces crops on an annual basis from pests with poor dispersal capabilities.
- Trap crops✓ are used to attract colonising pests into perimeter plantings where they can be readily destroyed by insecticide treatment or crop destruction.
- Diversification of the crops✓ grown within and between fields can be used to reduce the attractiveness of a crop and the frequency of pest colonisation. Irrigation levels can be manipulated to influence the susceptibility of a crop to pest damage. (Any 4 × 1) (4)

5.1.3
- Wear protective clothes when applying chemical insecticides.
- Follow the prescription for insecticide exactly.
- Do not store pesticides near food or where children can reach them.
- Do not eat or smoke while spraying and working with pesticides.
- Do not spray or dust under windy conditions to prevent contamination of the environment. (5)

5.2 5.2.1

- Watering
- Weeding
- Fertilising
- Temperature regulation/ventilation
- Debris removal
- Scouting
- Mulching
- Pruning
- Thinning
- Transplanting (Any 8 × 1) (8)

5.2.2

- Watering– Ensures that water requirements of plants are met
- Temperature regulation/ventilation – Controls humidity
- Removal of debris – Prevents spread of diseases and pests
- Scouting – Monitors the incidence of pests and diseases and take appropriate action (Any 3 × 1) (3)

5.3

- The requirements that the product should meet
- Who the competition are
- What are the costs involved for marketing
- How the marketing will be done
- Which marketing channels will be used
- Which products or volumes will be exported and which will be for the local market
- Who are our customers
- How the product will be packaged
- What the price of the commodity will be (Any 6 × 1) (6)

[30]

TOTAL: 150