Including examiner comments

R2113

UNDERSTANDING THE PRODUCTION OF OUTDOOR VEGETABLES & FRUIT

Level 2

Tuesday 20 June 2023
13:30 – 14:20

Written Examination

Candidate Number: .....

Candidate Name: .....

Centre Name: .....

IMPORTANT – Please read carefully before commencing:

i) The duration of this paper is **50** minutes;
ii) **ALL** questions should be attempted;
iii) **EACH** question carries **10 marks**;
iv) Write your answers legibly in the spaces provided. It is **NOT** necessary that all lined space is used in answering the questions;
v) Use **METRIC** measurements only;
vi) Use black or blue ink only. Pencil can be used for drawing purposes only. Ensure that all diagrams are labelled accurately with the line touching the named object;
vii) Where plant names are required, they should include genus, species and where appropriate, cultivar;
viii) Where a question requires a specific number of answers; only the first answers given that meet the question requirement will be accepted, regardless of the number of answers offered;
ix) Please note, when the word **'distinct'** is used within a question, it means that the items have different characteristics or features.

ANSWER ALL QUESTIONS

MARKS

Q1 State **TWO** limitations of **EACH** of the following site conditions for growing fruit and vegetables by completing the table below:

Site condition	Limitations	
Sandy soil texture	**1.** **2.**	**2**
Susceptible to frost	**1.** **2.**	**2**
Exposed to the wind	**1.** **2.**	**2**
pH 6.0	**1.** **2.**	**2**
Small area	**1.** **2.**	**2**

Please see over/…..

Total Mark

MARKS

Q2 a) Describe how to prepare a seed bed for sowing medium-sized vegetable seeds. **5**

b) Name **ONE** vegetable cultivar grown outdoors which has a medium-sized seed. **1**

c) Describe how to sow the seed named in b) in the prepared seed bed. **4**

Total Mark

Please turn over/…..

MARKS

Q3 Describe the production of courgettes under each of the following headings:

i)	**ONE** named cultivar	**1**
ii)	suitable site	**1**
iii)	planting	**4**
iv)	irrigation	**2**
v)	harvesting.	**2**

i)……

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ii)……

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iii)……

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iv)……

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v)……

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Total Mark

Please see over/…..

MARKS

Q4 a) Name **FOUR** plant groups for a four-bed system of crop rotation. **4**

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b) State **THREE** benefits and **THREE** limitations of crop rotation by completing the table below:

Benefits of crop rotation	**Limitations of crop rotation**	
1.		**2**
2.		**2**
3.		**2**

Total Mark

Please turn over/…..

MARKS

Q5 a) State what is meant by the terms diploid and triploid in apple production. **4**

b) Name **ONE** diploid and **ONE** triploid apple cultivar. **2**

c) Explain the importance of pollination groups in apples, giving **NAMED** plant examples in your answer. **4**

Total Mark

Please see over/…..

MARKS

Q6 Describe the establishment and maintenance of autumn-fruiting raspberries under the following headings:

i) named cultivar **1**
ii) planting **5**
iii) pruning of established plants. **4**

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iii)……

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Total Mark

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Charity Registration Number: 222879/SC038262

R2113

UNDERSTANDING THE PRODUCTION OF OUTDOOR VEGETABLES & FRUIT

Level 2

Tuesday 20 June 2023

Candidates Registered	**500**		**Total Candidates Passed**	360	82%
Candidates Entered	436	87%	Passed with Commendation	202	46%
Candidates Absent/Withdrawn	53	11%	Passed	158	36%
Candidates Deferred	11	2%	Failed	76	18%

Senior Examiner's Comments:

1 Candidates should be able to demonstrate a good range of plant knowledge and be able to give accurately named plant examples where appropriate. Common names and generic names are often too vague and cannot be rewarded in the positive manner that genus, species and where appropriate, variety/cultivar can. This is particularly important when answering questions relating to particular (named) plant(s). Marks can only be awarded for these narratives where the example(s) are correctly and fully identified.

2 Candidates must be able to display accurate knowledge of the technical terms and concepts detailed in the syllabus, in the context of horticulture and also be aware that wider interpretation will not be rewarded. The examination should be regarded as a possible introduction to higher level studies, which will only be open to those who are in possession of a clear understanding of the horticultural terms and concepts which are current.

3 The introductory rubric given on the first page of each question paper should be read carefully by candidates. At each examination there are a significant number of candidates who ignore or misread the instructions given and consequently may not perform as well as they could have done.

4 Candidates should pace themselves during each paper. The most successful candidates allow sufficient time to read the question thoroughly before answering it and also take time to read through their answers. They should take care to write as legibly as possible, so that the examiner is in no doubt about what is intended.

5 Candidates need to interpret key words within questions, particularly those such as ‘state’, ‘list’ and ‘describe’. Questions requiring descriptions or explanations obviously require a more detailed answer than those requiring a list.

6 It is important to ensure that responses to questions are to the point. Candidates should bear in mind that small sketches might be used to convey information more succinctly than words.

7 Successful candidates ensure that their answers are focused and to the point. It is disappointing when they cannot be rewarded for their efforts because the answer is irrelevant to the particular question. Candidates should take note of the mark allocation for specific sections and allocate their time and efforts accordingly.

8 Diagrams can enhance an answer and where appropriate can replace detailed descriptions. They should be large, clear and well annotated, ensuring that labels are properly attached to the features they describe. Diagrams should preferably be in pencil. Colour may be used successfully but only where it is relevant to the answer.

9 In each examination it is clear that some candidates are ill prepared to answer papers of the type set. It is essential that candidates have the opportunity to practice questions. Ideally some papers should be answered in a time constrained situation. Appropriate feedback must, in any case be provided.

Q1 State **TWO** limitations of **EACH** of the following site conditions for growing fruit and vegetables by completing the table below:

Site condition	Limitations
Sandy soil texture	**1.** **2.**
Susceptible to frost	**1.** **2.**
Exposed to the wind	**1.** **2.**
pH 6.0	**1.** **2.**
Small area	**1.** **2.**

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Q1 A range of limitations for specific site conditions for growing fruit and vegetables were provided by many candidates who were awarded maximum marks. Suitable answers included:

Site condition	Limitations
Sandy soil texture	**1.** Poor moisture retention. **2.** Nutrients are easily leached.
Susceptible to frost	**1.** Damage to buds/blossom of top fruit. **2.** Seedlings may be killed or damaged.
Exposed to the wind	**1.** Reduced pollination as pollinators do not fly in windy weather. **2.** Branches can be broken.
pH 6.0	**1.** Increased risk of club root in brassicas. **2.** Activity of micro-organisms reduced in acidic soils.
Small area	**1.** Crop rotation difficult to achieve. **2.** More difficult to grow permanent crops e.g. asparagus, rhubarb.

Candidates who provided solutions and not limitations for growing fruit and vegetables could not be awarded any marks.
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Q2 a) Describe how to prepare a seed bed for sowing medium-sized vegetable seeds.

b) Name **ONE** vegetable cultivar grown outdoors which has a medium-sized seed.

c) Describe how to sow the seed named in b) in the prepared seed bed.

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Q2 a) Good descriptions of how to prepare a seed bed for sowing medium-sized vegetable seeds were provided by the majority of candidates who achieved full marks. These included:

Mark out the area to be dug and dig a trench 30cm wide and 30cm deep i.e. spade/spit depth and place the soil at the opposite end of the area being dug. Dig the next trench, inverting the soil into the previous trench. Continue until the whole area has been dug and fill in the final trench with the soil from the first trench.

The soil is roughly raked level using a landscape or garden rake in all directions. Break any clods and remove any large stones. Following consolidation rake the soil until it is friable with a medium crumb structure. The final tilth is dependent on the size of the seed to be sown.

Marks were also awarded to candidates who described double digging.

b) Full marks were gained by candidates who named a suitable vegetable cultivar grown outdoors which has a medium-sized seed. Suitable answers included:

Pea ‘Kelvedon Wonder’, Beetroot ‘Boltardy’, Parsnip ‘Gladiator’, Sweetcorn ‘Sundance’.

c) Candidates who were able to describe how to sow specific medium-sized seed in a prepared seed bed gained maximum marks. Acceptable answers included:

Pea ‘Kelvedon Wonder’ are sown in a flat base drill, 3-5cm deep and 15cm wide which has been prepared using a draw hoe. Seeds are sown 7-8cm apart in single or double rows and covered by drawing the soil back over the drill. The drill can be watered prior to sowing the seed or following sowing.

Beetroot ‘Boltardy’ are sown in drills 2-3cm deep and 30cm apart. The seeds are station sown 10cm apart and covered by drawing the soil back over the drill. The drill can be watered prior to sowing the seed or following sowing.
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Q3 Describe the production of courgettes under each of the following headings:

i) **ONE** named cultivar
ii) suitable site
iii) planting
iv) irrigation
v) harvesting.

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Q3 Detailed descriptions were provided by candidates who had a good knowledge of the production of courgettes and were awarded full marks. Suitable answers included:

i) ONE named cultivar
e.g. 'Defender', 'Early Gem', 'Polka', 'Black Forest'.

ii) suitable site
Courgettes prefer a site that is sunny and sheltered from wind.

iii) planting
Courgettes are planted after the risk of frost has passed. A hole approximately one spade depth and width is dug and filled with a mixture of well-rotted organic matter or garden compost and soil. A general purpose, fertiliser e.g. Blood, Fish and Bone can also be sprinkled over the soil at a rate of 70g/m^2. At the time of planting ensure that the plants are hardened off and well-watered. The pots are removed and the plants are planted by using a trowel to make the hole to the same depth as they were in the pots, soil is backfilled and firmed. Courgettes are planted 90cm apart in all directions.

Candidates who described sowing courgette seed could not be awarded any marks.

iv) irrigation
Courgettes need to be kept moist and are watered frequently. The water must be targeted at the base of the plant to avoid powdery mildew. Watering should be carried out in the morning using a watering can or drip irrigation.

v) harvesting
Courgettes are harvested when they are young and 10-12.5cm in length, by cutting them from the base of the stem with a sharp knife. Regular harvesting will encourage more fruit to form. The flowers can also be harvested.
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Q4 a) Name **FOUR** plant groups for a four-bed system of crop rotation.

b) State **THREE** benefits and **THREE** limitations of crop rotation by completing the table below:

Benefits of crop rotation	**Limitations of crop rotation**
1.	
2.	
3.	

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Q4 a) The majority of candidates correctly named plant groups for a four-bed system of crop rotation and achieved full marks. Acceptable answers included:

Legumes, Brassicas, Potatoes, Onions and Roots.

b) The best candidates were able to provide a range of benefits and limitations of crop rotation and were awarded maximum marks. These included:

Benefits of crop rotation	**Limitations of crop rotation**
1. Enables specific soil preparation for specific crops. Reduces the likelihood of soil-borne pests and diseases.	Difficult to implement in a small area. Difficult to grow permanent crops e.g. asparagus, fruit trees.
2. Enables liming for brassicas to take place/avoids liming for potatoes which may cause scab. Avoids a build up of weeds. Land fouling crops e.g. carrots, onions. Land cleaning crops e.g. potatoes, brassicas.	Not effective against long-term pests and diseases e.g. eelworm and white rot of onions. Does not allow for personal preferences of crops.
3. Enables crops e.g. brassicas to utilise nitrogen fixed by legumes.	May not want the same area for each crop.
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Q5 a) State what is meant by the terms diploid and triploid in apple production.

b) Name **ONE** diploid and **ONE** triploid apple cultivar.

c) Explain the importance of pollination groups in apples, giving **NAMED** plant examples in your answer.

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Q5 a) Candidates who had a good understanding of specific terms relating to apple production gained full marks. Suitable answers included:

A diploid apple has two sets of chromosomes and can cross-pollinate with other diploid trees. It can also pollinate a triploid apple tree.

A triploid apple has three sets of chromosomes and produces sterile pollen which means that it requires a diploid apple tree for cross-pollination.

b) To achieve full marks candidates were required to name diploid and triploid apple cultivars. Acceptable answers by the best candidates included:

Diploid
'Discovery', 'Granny Smith, 'Laxton's Superb', 'James Grieve'.

Triploid
'Bramley's Seedling', 'Blenheim Orange', 'Jonagold', 'Jupiter'.

c) Many candidates provided good explanations of the importance of pollination groups in apples and were awarded maximum marks. Suitable answers included:

For successful cross-pollination it is important to plant apple cultivars that have the same or adjacent flowering periods. These may be early, mid or late season cultivars and are split into seven flowering groups. Early cultivars/flowering groups can be cross-pollinated by other early cultivars/flowering groups or mid-season cultivars/flowering groups as they overlap.

Mid-season cultivars/flowering groups can be cross-pollinated by all three seasonal cultivars/flowering groups as they overlap. Late cultivars/flowering groups can be cross-pollinated by other late season cultivars/flowering groups as they overlap. Crab apples are universal pollinators of apple trees as they flower for a long period.
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Q6 Describe the establishment and maintenance of autumn-fruiting raspberries under the following headings:

i) named cultivar
ii) planting
iii) pruning of established plants.

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Q6 Candidates who provided good descriptions of the establishment and maintenance of autumn-fruiting raspberries gained maximum marks. Acceptable answers included:

i) named cultivar
'All Gold', 'Autumn Bliss', 'Joan J', 'Polka'.

ii) planting
In autumn/early winter dig a trench and add bulky organic matter. A base dressing of bonemeal can also be incorporated into the trench. The dormant canes are spaced at 45-60cm apart with rows 1.5-2m apart. The roots of the canes are spread out evenly at a depth of 5-10cm using the soil mark on the stem as a guide. The trench is backfilled and gently firmed and a mulch of garden compost can be applied.

iii) pruning of established plants
In late winter or just before bud burst all canes are pruned to ground level or a maximum height of 8cm above ground level. In early summer the new shoots can be thinned to 8-10cm apart. Surplus canes are removed to prevent overcrowding as are those growing outside the required area. Pruning some canes to a height of 1m in winter will provide an earlier crop.

Candidates who described summer fruiting raspberries could not be awarded any marks.

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