



**R2113**

**UNDERSTANDING THE PRODUCTION OF  
OUTDOOR VEGETABLES & FRUIT**

**Level 2**

**Tuesday 7 February 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 a)** Describe **TWO** reasons for providing shelter for an outdoor food production area.

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**b)** Name **FOUR** plant species suitable for a living windbreak.

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Total Mark

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**MARKS**  
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**Q2 a) Describe the primary cultivation technique of single digging.**

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**b) Describe how soil texture and structure affect the timing of soil cultivation.**

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**MARKS**

**Q3** Describe the production of a crop of leeks under **EACH** the following headings:

- i) sowing
- ii) transplanting
- iii) harvesting

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**MARKS**

**Q4** Name **ONE** distinct pest and **ONE** distinct control method for **EACH** of the following vegetables:

- i) radish
- ii) potato
- iii) winter cabbage
- iv) carrot
- v) runner bean

by completing the table below.

<b>Vegetable</b>	<b>Pest</b>	<b>Control Method</b>
<b>Radish</b>		
<b>Potato</b>		
<b>Winter cabbage</b>		
<b>Carrot</b>		
<b>Runner bean</b>		

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**Please turn over/.....**

**MARKS**

**Q5 a) Name **ONE** dessert and **ONE** culinary plum cultivar.**

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**b) State the optimum time for pruning plum trees, giving **ONE** reason for this.**

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**c) Describe **ONE NAMED** training system for plums.**

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**MARKS**

**Q6** a) State what is meant by each of the following terms:

- i) top fruit
- ii) soft fruit

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i).....  
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b) State for **EACH** of the soft fruits listed:

- i) a **NAMED** cultivar
- ii) the growth type

by completing the table below.

**6**

<b>Soft fruit</b>	<b>Named cultivar</b>	<b>Growth type</b>
<b>Blackcurrant</b>		
<b>Gooseberry</b>		
<b>Grape</b>		
<b>Raspberry</b>		

Total Mark

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**The Royal Horticultural Society, Wisley, Woking, Surrey GU23 6QB.  
Charity Registration Number: 222879/SC038262**



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**UNDERSTANDING THE PRODUCTION OF  
OUTDOOR VEGETABLES & FRUIT**

**Level 2**

**Tuesday 7 February 2023**

<b>Candidates Registered</b>		<b>Total Candidates Passed</b>	
Candidates Entered	436	Passed with Commendation	202
Candidates Absent/Withdrawn	TBA	Passed	158
Candidates Deferred	TBA	Failed	76

**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

- a) Describe **TWO** reasons for providing shelter for an outdoor food production area.
- b) Name **FOUR** plant species suitable for a living windbreak

**Q1a)** Most candidates were able to describe suitable reasons for providing shelter for an outdoor food production area and achieved full marks. These included:

### **Wind reduction**

Wind can reduce vegetable crop production by 20-30%. It can blow crop support structures over, blow over tall brassica plants e.g. Brussels sprouts and blow blossom and fruit from trees. Wind can also uproot trees, break off branches and desiccate crops as well as cause soil erosion. If shelter is provided there is a reduction in transpiration rates from plants and damage from wind scorch.

### **Frost potential**

Frost kills fruit buds and top fruit flowers, kills and/or damages emerging seedlings and causes frost burn on foliage. Provision of solid shelter at the lowest ground level may create a frost pocket and should be avoided.

### **Influences on pollination**

Exposure to wind discourages pollinating insects from flying resulting in reduced yield and regularity of fruit crops. Provision of shelter provides better conditions for pollinators.

**Q1b)** Candidates who were able to name plant species suitable for a living windbreak were awarded full marks. Suitable answers included:

*Fagus sylvatica, Carpinus betulus, Crataegus monogyna, Taxus baccata, Pinus nigra, x Cuprocyparis leylandii.*

## Q2

- a) Describe the primary cultivation technique of single digging.
- b) Describe how soil texture and structure affect the timing of soil cultivation

**Q2a)** Detailed descriptions were provided by candidates who had a good understanding of the technique of single digging. Acceptable answers which gained maximum marks included:

Mark out the area before taking out a trench 30cm wide and 30cm deep and placing the soil at the opposite end of the area to be dug. Dig the next trench, inverting the soil into the previous trench. Continue until the whole area has been dug, filling the final trench with soil from the first one. Bulky organic matter can be added to each trench during the digging process.

**Q2b)** The best candidates had a good knowledge of how soil texture and structure affect the timing of soil cultivation and achieved maximum marks. Suitable answers included:

Sandy soils can be cultivated at almost any time of the year but are usually cultivated in spring whereas clay soils are best cultivated in late summer/early autumn to take advantage of frosts breaking down clods during the winter. Clay soils should not be cultivated when wet and no soil should be cultivated when waterlogged or frozen.

The structure of a sandy soil is very free draining and therefore compaction is less of a problem in winter although creation of a tilth may result in surface capping after heavy rain/irrigation. The structure of a clay soil is easily damaged by poorly timed cultivation e.g. when wet as clay particles smear easily and compaction occurs.

### Q3

Describe the production of a crop of leeks under the following headings:

- i) sowing
- ii) transplanting
- iii harvesting

**Q3)** Many candidates provided good descriptions of the production of a crop of leeks and were awarded full marks. These included:

i) **Sowing**

Leeks can be sown in a greenhouse/protected structure from mid-late winter or in early spring. The seeds are sown broadcast, in seed trays using a seed sowing compost e.g. John Innes or individually or in groups of 3-4 seeds in modules. The seeds are covered, watered and labelled.

Alternatively, they can be sown directly outdoors in a prepared seedbed from early to mid-spring. The seeds are sown thinly in drills 150mm apart and 10-20mm deep. The drills are covered watered, and labelled.

ii) **Transplanting**

Leeks are transplanted when they are pencil thick and approximately 200mm tall. The roots are trimmed to 20-30mm. A hole is made with a dibber 150-200mm deep and spaced at 150-230mm. Rows are 300-400mm apart. A single transplant is dropped into each hole which is then filled with water. The soil will naturally backfill around the transplant to create a blanched stem.

Module grown leeks are watered well prior to transplanting. A hole is dug with a trowel. Modules are planted at 300mm spacing if multi sown or 150-230mm if sown singly. Rows are spaced at 300mm.

iii) **Harvesting**

Leeks can be harvested from late summer onwards when they are quite small to increase the cropping period. Alternatively, they can be left in the ground through the winter and harvested when required. The leeks are carefully lifted with a fork and the tops and roots are trimmed.

**Q4**

Name **ONE** distinct pest and **ONE** distinct control method by completing the table below.

Vegetable	Pest	Control Method
Radish		
Potato		
Winter cabbage		
Carrot		
Runner bean		

**Q4)** Candidates who were able to name pests and a suitable method of control for specific vegetables gained full marks. Acceptable answers included:

Vegetable	Pest	Control Method
Radish	Flea beetle	Cover the crop with horticultural fleece or water the crop with nitrogen rich fertiliser to help the crop outgrow the pest.
Potato	Potato cyst eelworm	Practice a long crop rotation. Lift the potatoes as soon as the crop is ready. Ensure that all potatoes are harvested. Grow resistant cultivars e.g. Potato 'Cara' and 'Maris Piper'.
Winter cabbage	Cabbage white butterfly/caterpillar	Grow under fine netting e.g. enviromesh/fleece or pick off the caterpillars by hand and destroy. Biological control e.g the nematode <i>Steinernema carpocapsae</i> or spray with natural pyrethrins.
Carrot	Carrot fly	Sow thinly to reduce the need for thinning. Thin carrots in the evening and remove the thinnings. Erect a 600mm high barrier of either polythene/fleece/enviromesh around the crop. Grow resistant cultivars e.g. Carrot 'Resistafly'.
Runner bean	Black bean aphid	Squash aphid colonies where practical. Encourage natural predators e.g. ladybirds. Blast off with jet of water. Spray with natural pyrethrins.

Candidates who named diseases instead of pests could not be awarded any marks.

## Q5

- a) Name **ONE** dessert and **ONE** culinary plum cultivar.
- b) State the optimum time for pruning plum trees, giving **ONE** reason for this.
- c) Describe **ONE NAMED** training system for plums.

**Q5a)** The majority of candidates correctly named dessert and culinary plums and were awarded full marks. These included:

**Dessert** – ‘Victoria’, ‘Early Laxton’, ‘Merton Gem’, Herman.

**Culinary** – ‘Czar’, ‘Purple Pershore’, ‘Marjorie’s Seedling’, ‘Early Rivers’.

**Q5b)** Candidates who stated that plum trees should be pruned in June/July to reduce the risk of silver leaf disease gained maximum marks.

**Q5c)** Detailed descriptions were provided by candidates who had a good knowledge of suitable training systems for plums and achieved maximum marks. Suitable answers included:

### **Fans**

Plum trees are planted 150-230mm away from a wall or fence which is fitted with horizontal wires that are 150mm apart. The tree is trained to ensure that the main branches radiate out in a fan shape. The central leader is removed to concentrate vigour on both sides of the tree while laterals are cut back to strong buds to encourage side shoots or ‘ribs’. Side shoots are tied in to extend the framework and shoots pointing in the wrong direction are removed.

Candidates who described cordon or pyramid training systems for plums were also awarded full marks.

**Q6**

**a)** State what is meant by each of the following terms:

- i) top fruit
- ii) soft fruit

**b)** State:

- i) a **NAMED** cultivar
- ii) the growth type

for **EACH** of the soft fruits listed, by completing the table below;

<b>Soft Fruit</b>	<b>Named Cultivar</b>	<b>Growth Type</b>
<b>Blackcurrant</b>		
<b>Gooseberry</b>		
<b>Grape</b>		
<b>Raspberry</b>		

**Q6a)** Most candidates understood the meaning of the specific terms and were awarded full marks. Acceptable answers included:

i) **Top fruit**

Top fruit is fruit that grows on trees which are mostly grafted onto specific rootstocks and are long lived. Top fruit can be trained/restricted for small spaces.

ii) **Soft fruit**

Soft fruit is fruit that grows on a bush/shrub, canes or low to the ground. It is usually grown on its own roots, is self-pollinating and short lived compared to top fruit. Soft fruit may require a support system for specific fruit e.g. raspberry.



**Q6b)** Many candidates achieved full marks by providing suitable cultivars and the growth type for specific soft fruits. These included:

<b>Soft fruit</b>	<b>Named cultivar</b>	<b>Growth type</b>
<b>Blackcurrant</b>	'Ben Hope', 'Ben Sarek', 'Baldwin', 'Ben Lomond'.	Bush.
<b>Gooseberry</b>	'Greenfinch', 'Invicta', 'Leveller', 'Lord Derby'.	Bush.
<b>Grape</b>	'Boskoop Glory', 'Brandt', 'Muscat Bleu', 'Dornfelder'.	Vine.
<b>Raspberry</b>	'Malling Jewel', 'Autumn Bliss', 'Glen Ample', 'Leo'.	Cane.