



**R2113**

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

**Level 2**

**Tuesday 12 February 2019**

**13:30 – 14:20**

**Written Examination**

**Candidate Number:** .....

**Candidate Name:** .....

**Centre Number/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 lined space 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;
- 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 how **EACH** of the following factors affect the suitability of a site selection for outdoor food production:

- i) susceptibility to frost;
- ii) soil pH;
- iii) slope.

**2**  
**4**  
**4**

i).....

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**MARKS**

**Q2 a)** Name **TWO** distinct materials used to construct the framework of a raised bed.

**2**

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**b)** State a specification of a raised bed and path.

**3**

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**c)** Describe the 'no-dig' system for managing raised beds.

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**MARKS**

**Q3** State **ONE** distinct pest and **ONE** distinct control measure for the stated pest, for **EACH** of the following vegetables, by completing the table below:

| <b>Vegetable cultivar</b> | <b>Pest</b> | <b>Control measure</b> |
|---------------------------|-------------|------------------------|
| <b>Carrot</b>             |             |                        |
| <b>Lettuce</b>            |             |                        |
| <b>Runner bean</b>        |             |                        |
| <b>Radish</b>             |             |                        |
| <b>Brussels sprouts</b>   |             |                        |

**2****2****2****2****2**

Total Mark

**Please see over/.....**

**MARKS**

**Q4** Describe the harvesting and storage of a **NAMED** main crop of potatoes under **EACH** of the following headings:

- i) named cultivar;
- ii) harvesting;
- iii) storage.

**1**  
**5**  
**4**

i).....

ii).....

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**MARKS**

**Q5** Describe the production of strawberries under **EACH** of the following headings:

- i) named cultivar;
- ii) planting;
- iii) harvesting.

**1  
5  
4**

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**MARKS**

**Q6 a)** Name **ONE** example of an apple cultivar for **EACH** of the following:

- i) diploid cultivar;
- ii) triploid cultivar.

**1**  
**1**

i).....

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ii).....

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**b)** Describe the cross-pollination of an apple crop under **EACH** of the following headings:

- i) flowering periods;
- ii) compatibility.

**4**  
**4**

i).....

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Total Mark

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





Inspiring everyone to grow

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**Level 2**

**Tuesday 12 February 2019**

|                              |            |     |                                |            |            |
|------------------------------|------------|-----|--------------------------------|------------|------------|
| <b>Candidates Registered</b> | <b>414</b> |     | <b>Total Candidates Passed</b> | <b>252</b> | <b>77%</b> |
| Candidates Entered           | 327        | 80% | Passed with Commendation       | 101        | 31%        |
| Candidates Absent/Withdrawn  | 79         | 13% | Passed                         | 151        | 46%        |
| Candidates Deferred          | 6          | 7%  | Failed                         | 75         | 23%        |

**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
- 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 how **EACH** of the following factors affect the suitability of a site selection for outdoor food production:

- |      |                          |          |
|------|--------------------------|----------|
| i)   | susceptibility to frost; | <b>2</b> |
| ii)  | soil pH;                 | <b>4</b> |
| iii) | slope.                   | <b>4</b> |

**Q1a)** The best candidates clearly stated how specific factors affect the suitability of a site for outdoor food production and were awarded full marks. Acceptable answers included:

- i) Susceptibility of a site to frost can cause frost damage to fruit buds and flowers, seedlings can be killed, sowing times are delayed as the soil is slow to warm up in the spring and frost pockets at the base of a slope must be avoided.
- ii) Most crops will grow on a soil with a pH of 6.5 – 7.0 although some require a more specific pH. Blueberries prefer an acidic soil whereas brassicas require an alkaline soil to avoid club root. Although potatoes prefer a slightly acidic soil they will grow well in a neutral to slightly alkaline soil. Potatoes can be affected by potato scab in very alkaline soils. Problems with nutrient uptake can occur in soils with a low or high pH e.g. lime induced chlorosis in ericaceous plants that are grown in an alkaline soil.
- iii) If a site selected for outdoor food production is on a slope there could be problems with soil erosion, it may be difficult to work, dry at the top and wet at the bottom with run off which could lead to a build-up of nutrients at the base of the slope. The top of the site would be exposed to wind and the aspect would affect how quickly the site warms up in the spring. A south facing slope will warm up quickly whereas a north facing slope will be colder.

|  | <b>MARKS</b> |
|--|--------------|
| <b>Q2 a)</b> Name <b>TWO</b> distinct materials used to construct the framework of a raised bed. | <b>2</b>     |
| b) State a specification of a raised bed and path.   | <b>3</b>     |
| c) Describe the 'no-dig' system for managing raised beds.  | <b>5</b>     |

**Q2)** The majority of candidates were able to name materials used to construct the framework of a raised bed and gained maximum marks. These included:

Timber planks, scaffold boards, bricks, blocks, new railway sleepers.

**Q2b)** Suitable dimensions of a raised bed and path provided by the best candidates achieved full marks. These were:

**Width** – 1.2 – 1.6m

**Length** – 2.5 – 3m

**Path** – 0.5m wide (Can be up to 1m wide for wheelchair access)

**Q2c)** Most candidates had a good understanding of the 'no-dig' system for managing raised beds and achieved full marks. Descriptions included the following points:

- The soil is not turned over apart from the initial cultivation.
- Soil improvers/bulky organic matter are spread thickly on the surface of the soil.
- Soil organisms incorporate the organic matter etc. into the soil.
- Maintains soil structure.
- Avoids compaction of the soil.
- Soil erosion is reduced.
- Encourages biotic/organism diversity.
- Weed seed is not brought to the surface.

**Q3** State **ONE** distinct pest and **ONE** distinct control measure for the stated pest, for **EACH** of the following vegetables, by completing the table below:

| Vegetable cultivar | Pest | Control measure |
|--------------------|------|-----------------|
| Carrot             |      |                 |
| Lettuce            |      |                 |
| Runner bean        |      |                 |
| Radish             |      |                 |
| Brussels sprouts   |      |                 |

**2**  
**2**  
**2**  
**2**  
**2**

**Q3)** Candidates who provided distinct pests and control measures for each of the vegetables were awarded full marks. Suitable answers included:

| Vegetable Cultivar | Pest                            | Control Measure  |
|--------------------|---------------------------------|--|
| Carrot             | Carrot Root Fly                 | 60cm high barrier, sow thinly to avoid thinning, thin crop in evening, use of resistant cultivars.   |
| Lettuce            | Slug                            | Hand removal, slug pellets e.g. ferric phosphate, beer traps, water soil with nematode i.e. <i>Phasmarhabditis hermaphrodita</i> .                                   |
| Runner bean        | Black Bean Aphid                | Spray with Fatty Acids, Deltamethrin, Lambda-cyhalothrin, Cypermethrin.  |
| Radish             | Flea Beetle                     | Spray with Deltamethrin, Lambda-cyhalothrin, Cypermethrin, cover seedlings/plants with Enviromesh.   |
| Brussels sprouts   | Large Cabbage White Caterpillar | Encourage starlings to eat the larvae, cover crop with Enviromesh before the butterfly lays the eggs, Use of a biological control e.g. <i>Apanteles glomeratus</i> . |

**Q4** Describe the harvesting and storage of a **NAMED** main crop of potatoes under **EACH** of the following headings:

- |      |                 |          |
|------|-----------------|----------|
| i)   | named cultivar; | <b>1</b> |
| ii)  | harvesting;     | <b>5</b> |
| iii) | storage.        | <b>4</b> |

**Q4)** Maximum marks were awarded to candidates who were able to describe the harvesting and storage of a main crop of potatoes. Suitable answers included:

- i) Cara, Desiree, King Edward, Maris Piper, Pentland Crown, Sarpo Mira, Majestic are all cultivars of main crop potatoes.
- ii) Harvesting is carried out from August – October on a dry, sunny day when the haulm has started to dry and collapse. The potatoes are carefully lifted using a fork, avoiding spearing the potatoes. It is important to ensure that no potatoes are left in the soil to prevent the occurrence of disease in the future. Potatoes can be left on the surface of the soil for 2-3 hours to dry.
- iii) Potatoes should be stored in hessian sacks or double thickness paper sacks in a cool, dark, frost and vermin free environment. Diseased or damaged tubers should not be stored.

**Q5** Describe the production of strawberries under **EACH** of the following headings:

- |      |                 |          |
|------|-----------------|----------|
| i)   | named cultivar; | <b>1</b> |
| ii)  | planting;       | <b>5</b> |
| iii) | harvesting.     | <b>4</b> |

**Q5** Many candidates provided good descriptions of the production of strawberries and gained full marks. Suitable answers included:

- i) 'Cambridge Favourite', 'Elsanta', 'Malling Centenary', 'Christine', 'Florence' are all suitable cultivars of strawberries.
- ii) Strawberry plants should be soaked well before planting. They are planted in August/September or in the spring in a sunny, sheltered situation with humus rich fertile, well-drained soil. The plants are planted 40 – 50cm apart in the row with 60 – 90cm between the rows. The crown of the plant should be above soil level to avoid rotting and the plants must be firmed in well to prevent frost heave and drying out.
- iii) Strawberries are harvested when the fruits are pink/red all over on a dry day. The fruits are picked carefully to avoid bruising by pinching the stalk between the fingers to ensure that the calyx is intact and not by twisting. Any damaged or mouldy fruits are discarded. It is important not to pile too many fruits on top of each other to avoid bruising/crushing.

**MARKS**

**Q6 a)** Name **ONE** example of an apple cultivar for **EACH** of the following:

- i) diploid cultivar; **1**
- ii) triploid cultivar. **1**

**b)** Describe the cross-pollination of an apple crop under **EACH** of the following headings:

- i) flowering periods; **4**
- ii) compatibility. **4**

**Q6)** Most candidates were able to name specific apple cultivars and were awarded full marks. Acceptable answers included:

- i) 'James Grieve', 'Cox's Orange Pippin', 'Egremont Russet', 'Discovery' are all diploid cultivars.
- ii) 'Bramley's Seedling', 'Blenheim Orange', 'Jupiter', 'Suntan' are all triploid cultivars.

Candidates who mixed up diploid and triploid cultivars could not be awarded any marks.

**Q6b)** Candidates who clearly understood the cross-pollination of an apple crop achieved full marks. Suitable answers included:

- i) For successful cross-pollination it is necessary to grow apple cultivars that have the same flowering periods. These may be early, mid or late season cultivars and can be divided into seven flowering groups. Early cultivars/flowering groups can be cross-pollinated by other early cultivars or by mid-season cultivars as they overlap. Mid-season cultivars/flowering groups can be cross-pollinated by all three seasonal cultivars as they overlap. Late cultivars can be cross-pollinated by other late season cultivars/flowering groups and by mid-season cultivars/flowering groups as they overlap. Crab apples are universal pollinators of apple trees as they flower over a long period.
- ii) Apple trees are not reliably self-fertile and need other apple cultivars flowering in the same period to cross-pollinate. Apple cultivar pollen is only compatible with other apple cultivars. Triploid cultivars are incompatible with each other and are poor pollinators as their pollen is sterile. They require two diploid cultivars for cross-pollination to take place.

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