

**R2103****MAINTAINING PLANT HEALTH**

Level 2

Monday 19 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.













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



## R2103

### MAINTAINING PLANT HEALTH

#### Level 2

Monday 19 June 2023

<b>Candidates Registered</b>	<b>317</b>		<b>Total Candidates Passed</b>	<b>203</b>	<b>69%</b>
Candidates Entered	292	92%	Passed with Commendation	62	21%
Candidates Absent/Withdrawn	22	7%	Passed	141	48%
Candidates Deferred	3	1%	Failed	89	31%

#### 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)** State **ONE** benefit for plant health of encouraging **EACH** of the following in the garden:

- i) ladybird
- ii) hoverfly larvae
- iii) lacewings
- iv) frogs

b) Describe **TWO** distinct methods of encouraging beneficial organisms in the garden.

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**Q1 a)** Candidates were awarded maximum marks where they provided a suitable benefit for plant health of encouraging specific beneficials in the garden. These included:

- i) **ladybird** – feed on aphids, scale insects, mites, whitefly.
- ii) **hoverfly larvae** – feed on aphids, thrips, scale insects, mites, small caterpillars.
- iii) **lacewings** – feed on aphids, insect eggs, mites, scale insects, thrips, mealy bugs, small caterpillars.
- iv) **Frogs** – predate on invertebrates e.g. slugs

**b)** Full marks were awarded to candidates who provided good descriptions of methods of encouraging beneficial organisms in the garden. Suitable answers included:

- creating habitats for beneficials e.g. log piles, hoverfly lagoons and areas of long grass
- including water features e.g. a wildlife pond with sloping sides and marginal plants e.g. *Caltha palustris* which will attract pollinators as well as frogs
- planting hedgerows of native species e.g. *Crataegus monogyna*, *Prunus spinosa*, *Corylus avellana*, *Ilex aquifolium*. These create wildlife corridors as well as nesting locations for birds and hedgehogs
- sow wildflower meadows to attract pollinators and ladybirds.

**Q2 a)** Name **TWO** ephemeral weeds.

- b) Describe the problems that ephemeral weeds can cause in a **NAMED** horticultural situation.
- c) Describe **ONE** method of controlling ephemeral weeds.

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**Q2 a)** The majority of candidates were able to correctly name ephemeral weeds and achieved maximum marks. Acceptable answers included:

*Capsella bursa-pastoris, Cardamine hirsuta, Poa annua, Senecio vulgaris, Stellaria media.*

Candidates who name annual or perennial weeds could not be awarded any marks.

**b)** The best candidates provided good descriptions of the problems that ephemeral weeds can cause in a specific situation and gained full marks. These included:

In a recently cultivated vegetable garden ephemeral weeds will compete for light, nutrients and water with new seedlings causing a reduction in plant growth. Ephemeral weeds produce a large amount of seed throughout the year and can compete for space below and above ground with crops. Ephemeral weeds can harbour pests and diseases e.g. whitefly, red spider mite and cucumber mosaic virus. Ephemeral weeds can interfere with the harvesting and spoil the quality of the crop as well as affect the visual appearance of the area.

**c)** A range of suitable methods of controlling ephemeral weeds were described by candidates who were awarded full marks. These included:

- regular hoeing on a dry day before the weeds flower or set seed
- mulching with a weed seed free material e.g. bark chips
- use of a contact herbicide e.g. acetic acid
- use of the stale seedbed technique i.e. prepare the seedbed two weeks prior to sowing, allow weed seeds to germinate, then hoe them off before sowing.

**Q3 a)** Describe the damage that rabbits can cause in a garden.

b) Describe **TWO** distinct and humane methods of protecting garden plants from damage by rabbits.

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**Q3 a)** Most candidates had a good understanding of the damage that rabbits can cause in a garden and achieved full marks. Suitable descriptions included:

Rabbits will eat soft green plant tissue e.g. new growth on herbaceous perennials or vegetables. They will also eat woody plants which can be grazed to a height of 50cm when the rabbits stand on their hind legs. Bark on woody plants is also gnawed and can be killed if the tree/branch is ring-barked. Rabbits dig holes underneath plants by burrowing, damaging plant roots and dig scrapes in flower beds and lawns which look unsightly.

**b)** Candidates were required to describe humane methods of protecting garden plants from damage by rabbits to gain maximum marks. Suitable answers included:

- rabbit proof fencing made from wire netting with a mesh size of 30mm and a height of 120cm is buried to a depth of 30cm with the lower part bent outwards to prevent burrowing
- plastic spiral, weld mesh or biodegradable tree guards can be placed around the lower 50-75cm of the stem of trees
- Shooting or trapping rabbits by a qualified professional who holds a licence.

- Q4 a)** Describe the symptoms of rose black spot.
- b) State how rose black spot spreads.
- c) Describe **TWO** methods of preventing plant health problems from rose black spot.

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**Q4 a)** A good understanding of the symptoms of rose black spot were required by candidates to achieve full marks. The best answers included:

Black spots appear on the upper surface of rose leaves which in time turn yellow, (around the spots initially). When the infection is severe the infected leaves drop prematurely and scabby lesions occur on the stems. Overall, the vigour of the plant is reduced.

- b)** The majority of candidates correctly stated that rose black spot spreads by spores from the black spots/stem lesions in rain/wet conditions and on contaminated secateurs when deadheading in wet weather.
- c)** Maximum marks were gained by candidates who clearly described suitable methods of preventing plant health problems from rose black spot. These included:
- collect fallen leaves in the autumn and destroy them by burning
  - prune out any stem lesions in spring before leaves appear and burn them
  - large flowered hybrids and cluster flowered hybrids should be hard pruned in mid to late winter 3-5 buds from ground level and the arisings burnt
  - spray the stems after pruning with a fungicide e.g. tebuconazole as it is a preventative fungicide
  - select resistant cultivars e.g. *Rosa rugosa*, *Rosa gallica* 'Versicolor'.

**Q5 a)** Describe the plant health problems that can be caused by peach potato aphid.

b) Describe **TWO** garden practices that can cause an increase in aphids by disturbing the natural balance.

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**Q5 a)** Candidates who provided good descriptions of the plant health problems that can be caused by peach potato aphid were awarded full marks. Acceptable answers included:

- peach potato aphid causes damage through the stylet mouth part piercing and sucking sap from the leaves and stems
- young growth becomes stunted and the leaves are distorted
- viruses e.g. cucumber mosaic virus and peach leaf curl virus can be introduced
- sooty mould which can result from the excreted honeydew prevents photosynthesis and can cause leaf fall.

**b)** A range of garden practices that can cause an increase in aphids were provided by many candidates who achieved full marks. Suitable answers included:

- regular use of pesticides may kill aphid predators. Aphids build up resistance to pesticides and then have fewer predators to control them
- the removal of natural habitats for predators e.g. the constant mowing of lawns, cutting back long grass, clearing any wild areas/trees/hedgerows, replacing plants with hard landscaping
- monocultures e.g. planting a large bed of potatoes may enable an infestation of aphids as there will not be any plants nearby to attract beneficials.

**Q6 a)** Describe the following plant disorders:

- i) fasciation
- ii) rose balling

b) Describe how waterlogging affects plant growth.

c) State **ONE** method of avoiding waterlogging.

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**Q6 a)** Good descriptions of specific plant disorders were provided by many candidates who gained full marks. These included:

- i) **fasciation** is where several shoots of specific plants e.g. Forsythia are flattened and elongated and appear to be fused together. Flowerheads can also be compressed together giving a 'daisy head' appearance.
  
- ii) **rose balling** is where fully developed rose and peony buds fail to open. Rose balling affects double flowers or soft petalled flowers. The buds become soft and slimy and the outer petals become brown. The buds may fall off and grey mould may develop.

**b)** Most candidates were able to provide descriptions of how waterlogging affects plant growth and were awarded maximum marks. Suitable answers included:

Waterlogging causes anaerobic respiration/lack of oxygen to the plant. This is identified by yellowing of the leaves, roots rotting, often turning blue/black in colour and death of the plant if not corrected. Although the plant may wilt this should not be confused with drought.

**c)** A range of suitable methods of avoiding waterlogging were provided by the best candidates who achieved maximum marks. These included:

- soil drainage e.g. French drains
- improving soil structure by incorporating organic matter/horticultural grit
- double digging or subsoiling on a large scale to break up compaction
- creating a rain garden to divert water.