Including examiner comments

R2103

MAINTAINING PLANT HEALTH

Level 2

Monday 5 February 2024

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.

Ofqual Unit Code: Y/505/2835

Please turn over/…..

ANSWER ALL QUESTIONS

MARKS

Q1 a) State **TWO** benefits to plant health of encouraging **EACH** of the following in the garden:

i) birds **2**
ii) hedgehogs **2**

i)……

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ii)……

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b) Describe how to minimise risks to the environment from pesticide use. **6**

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Total Mark

Please see over/…..

MARKS

Q2 a) Describe what is meant by the term ‘weed’. **2**

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b) Name **TWO** distinct weeds found in **EACH** of the following situations:

i) herbaceous borders **2**
ii) shrub borders **2**
iii) lawns **2**

i)……

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ii)……

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iii)……

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c) State **ONE** method of controlling weeds in lawns. **2**

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Total Mark

Please turn over/…..

MARKS

Q3 a) Describe the life cycle of the cabbage white (large white) butterfly. **6**

b) Describe **TWO** distinct methods of minimising the damage to plants from the cabbage white (large white) butterfly. **4**

Total Mark

Please see over/…..

MARKS

Q4 a) Describe **TWO** plant health problems caused by grey mould. **4**

b) State the environmental conditions that encourage the spread of grey mould. **2**

c) Describe **TWO** distinct methods of preventing the spread of grey mould. **4**

Total Mark

Please turn over/…..

MARKS

Q5 a) State **TWO** benefits and **TWO** limitations of biological controls for plant health problems, (excluding cost) by completing the table below. **4**

Benefit of biological control	**Limitation of biological control**
1.	**1.**
2.	**2.**

b) Describe **TWO** distinct examples of appropriate plant selection to avoid plant health problems. **6**

Total Mark

Please see over/…..

MARKS

Q6 a) Describe how plant growth can be affected by **EACH** of the following:

i) high temperature **2**
ii) drought **2**
iii) shade **2**
iv) frost **2**

i)……

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ii)……

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iii)……

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iv)……

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b) Describe **ONE** method of avoiding frost damage to plants. **2**

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Total Mark

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

RHS LEVEL 2 CERTIFICATE IN THE PRINCIPLES OF PLANT GROWTH, PROPAGATION AND DEVELOPMENT

Monday 5 February 2024

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.

Unit R2103 Maintaining Plant Health

Examiners Comments:

Q1

a) State **TWO** benefits to plant health of encouraging **EACH** of the following in the garden:

i) birds
ii) hedgehogs

b) Describe how to minimise risks to the environment from pesticide use.

Q1a) A range of benefits to plant health of encouraging specific predators were provided by many candidates who were awarded full marks. Suitable answers included:

i) **birds** are predators of many garden pests e.g. thrushes eat snails and blue tits eat aphids and caterpillars.
ii) **hedgehogs** are predators of many garden pests e.g. slugs, millipedes, caterpillars, insect larvae and beetles.

Q1b) Good descriptions of how to minimise risks to the environment from pesticide use were provided by many candidates who achieved maximum marks. These included:

It is important to only use approved products which have been stored correctly in their original containers. Always follow the instructions on the pesticide container using the specified amounts/concentrations. The product should only be used in suitable weather conditions i.e. do not use in windy or hot, sunny conditions. Pesticides should not be used near ponds or when pollinating insects are about.

Candidates who described the use of cultural, physical and biological control methods to avoid using pesticides could not be awarded any marks.

Q2

a) Describe what is meant by the term ‘weed’.

b) Name **TWO** distinct weeds found in **EACH** of the following situations:

i) herbaceous borders
ii) shrub borders
iii) lawns

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c) State **ONE** method of controlling weeds in lawns.

Q2a) Candidates who described a weed as a plant growing out of place with an invasive nature due to the large number of seeds produced/deep tap root/spreading rhizome/stolon etc. gained full marks.

Q2b) The majority of candidates named suitable weeds found in specific situations and were awarded full marks. Acceptable answers included:

i) **herbaceous borders**
Poa annua, Calystegia sepium, Veronica persica.

ii) **shrub borders**
Elymus repens, Aegopodium podagraria, Convolvulus arvensis.

iii) **Lawns**
Taraxacum officinale, Ranunculus repens, Bellis perennis.

Q2c) The best candidates correctly stated that weeds can be controlled in lawns by either digging them out e.g. *Bellis perennis* with a hand fork or by the use of an appropriate selective herbicide e.g. 2,4-D and achieved maximum marks.

Q3

a) Describe the life cycle of the cabbage white (large white) butterfly.

b) Describe **TWO** distinct methods of minimising the damage to plants from the cabbage white (large white) butterfly.

Q3a) Candidates who had a good knowledge of the life cycle of the cabbage white (large white) butterfly were awarded full marks. Suitable answers included:

The cabbage white butterfly overwinters as a pupa and emerges during late spring to start laying clusters of yellow skittle shaped eggs on the top and underside of brassica leaves. The caterpillars emerge in 14 days and there will be two or three generations a year. The caterpillars feed on brassica leaves from June to September and moult as they grow. They seek crevices in sheltered places to pupate.

Q3b) Most candidates were able to describe suitable methods of minimising damage to plants from the cabbage white butterfly and gained full marks. Appropriate answers included:

Brassicas can be covered with fine netting/mesh/horticultural fleece prior to the butterflies laying their eggs. The netting must be kept from touching the brassicas to avoid eggs being laid through the netting.

Regular inspection of the brassica can be carried out where eggs or caterpillars can be removed by hand.

Biological control can be carried out with the use of parthenogenic nematodes e.g. *Steinernema feltiae* in cool/dull/damp weather.

Q4

a) Describe **TWO** plant health problems caused by grey mould.

b) State the environmental conditions that encourage the spread of grey mould.

c) Describe **TWO** distinct methods of preventing the spread of grey mould.

Q4a) Many candidates were able to describe plant health problems caused by grey mould and achieved maximum marks. These included:

Grey mould causes rots on flowers and fruits where the affected parts can shrivel. On strawberries it leads to a soft brown decay and on cane fruits e.g. blackberry/raspberry it kills the branches.

Q4b) High humidity, moisture and lack of air flow were correctly identified by candidates as the environmental conditions that encourage the spread of grey mould and were awarded full marks.

Q4c) Candidates who had a clear understanding of suitable methods of preventing the spread of grey mould gained full marks. These included:

The spread of grey mould can be prevented by practicing good hygiene by removing affected leaves/buds/flowers promptly and clearing any dead plant material. Another effective method is to reduce humidity by improving ventilation and by spacing plants out to avoid overcrowding to increase air circulation around the plants.

Q5

a) State **TWO** benefits and **TWO** limitations of biological controls for plant health problems, (excluding cost) by completing the table below.

Benefit of biological control	**Limitation of biological control**
1.	**1.**
2.	**2.**

b) Describe **TWO** distinct examples of appropriate plant selection to avoid plant health problems.

Q5a) Candidates were required to state benefits and limitations of biological controls for plant health problems to achieve maximum marks. Suitable answers included:

Benefit of biological control	**Limitation of biological control**
Non toxic to people and animals.	Need a knowledge of plant pathogen life cycle before introduction.
No harmful residues left in plants/soil.	Can be easily affected by pesticides.

Q5b) A range of examples of appropriate plant selection to avoid plant health problems were described by many candidates who were awarded maximum marks. These included:

- Select plants that are appropriate for the soil pH to avoid nutrient deficiencies e.g. ericaceous plants for an acid soil e.g. *Camellia japonica*
- Select plants suitable for shade e.g. plants with dark green, broad leaves to prevent etiolation e.g. *Bergenia cordifolia*
- Select plants suitable for a sunny site e.g. plants with hairy leaves to prevent water loss e.g. *Stachys byzantina.*

Q6

a) Describe how plant growth can be affected by **EACH** of the following:

i) high temperature
ii) drought
iii) shade
iv) frost

b) Describe **ONE** method of avoiding frost damage to plants.

Q6a) Good descriptions of how plant growth can be affected by specific conditions were provided by the best candidates who gained full marks. Suitable answers included:

i) **high temperature** which can cause sun scold on the south facing parts of trees with thin bark. It can also scorch fruits of apples, tomatoes, peppers. Leaves can become scorched turning papery or displaying pale brown patches.
ii) **drought** causes the leaves of plants to become dull in colour and wilt. These turn brown and drop off. Plants can also run to seed and blossom end rot occurs in tomatoes. When drought is severe plants die once they have reached permanent wilting point.
iii) **shade** causes plants to produce etiolated growth and yellowing of leaves. In shaded situations the rate of photosynthesis is lower which results in reduced plant growth.
iv) **frost** causes scorching of shoot tips and leaves and above ground parts of plants blacken and die. Flowers and fruitlets of apple trees are killed.

Q6b) A range of methods of avoiding damage to plants were provided by the majority of candidates who achieved maximum marks. These included:

- avoid planting in frost pockets where cold air rolls downhill and collects against a solid barrier. Ensure the barrier is permeable to allow cold air to flow through
- cover plants with horticultural fleece or place straw around the plants to maintain a suitable temperature
- spray early fruit blossom with water to prevent damage to the flowers
- move tender/half-hardy plants into a glasshouse or cold frame to overwinter and provide heat if necessary.