



**R2103**

**MAINTAINING PLANT HEALTH**

**Level 2**

**Monday 14 February 2011**

**14.30 – 15.00**

**Written Examination**

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

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

**Centre Number/Name:** .....

**IMPORTANT – Please read carefully before commencing:**

- i) The duration of this paper is **30 minutes**;
- ii) **ALL** questions should be attempted;
- iii) **EACH** question carries **10 marks**;
- iv) Write your answers legibly in the spaces provided;
- v) Use metric measurements only;
- vi) Where plant names are required, they should include genus, species and where appropriate, cultivar.

## Answer all questions

**Marks**

1. a) Describe **ONE** named example of biological control for a **NAMED** plant pest.

**2**

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- b) State **TWO** benefits and **TWO** limitations of chemical and biological control methods by completing the table below:

**8**

		Chemical Control	Biological Control
<b>Benefits</b>	1		
	2		
<b>Limitations</b>	1		
	2		

Please see over .....

2. a) Name **TWO** examples of ephemeral weeds. 2

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- b) State **TWO** disadvantages of ephemeral weeds in an herbaceous perennial border. 2

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- c) Describe the action of the following types of herbicides, stating **ONE NAMED** active ingredient for **EACH**:

- |      |                         |   |
|------|-------------------------|---|
| i)   | contact;                | 2 |
| ii)  | translocated;           | 2 |
| iii) | residual (soil acting). | 2 |

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Please turn over .....

3. a) Define the term 'plant pest'. 2

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- b) Using a clearly labelled diagram outline the stages in the life cycle of the glasshouse whitefly. 6

- c) Name **TWO** different methods of controlling glasshouse whitefly. 2

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

4. a) Define the term 'plant physiological disorder'. 1

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- b) Using **NAMED** plant examples describe how plant growth is affected by **EACH** of the following:

- |      |                |   |
|------|----------------|---|
| i)   | frost;         | 2 |
| ii)  | water-logging; | 2 |
| iii) | drought.       | 2 |

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- c) For **EACH** condition listed in b), describe **ONE** method used to minimise its effect. 3

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Please turn over .....

5. a) Describe the damage caused by powdery mildew on a **NAMED** garden plant.

3

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- b) State **ONE** method of controlling powdery mildew.

1

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- c) Describe **THREE** ways of minimising the risks to people and the environment when using chemical control methods.

6

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Please see over .....

6. a) Name **FOUR** different pests of outdoor plants, and describe **ONE** distinctly different physical control method for **EACH**.

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- b) State **TWO** factors that should be considered when selecting plants to avoid plant health problems.

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**R2103**

## **MAINTAINING PLANT HEALTH**

**Level 2**

**Monday 14 February 2011**

<b>Candidates Registered</b>	578	<b>Pass with Commendation</b>	163 (34.39%)
<b>Candidates Entered</b>	474	<b>Pass</b>	205 (43.25%)
<b>Absent/Withdrawn/Deferred</b>	104	<b>Fail</b>	106 (22.36%)
<b>Total Candidates Passed</b>	368 (77.64%)		

### **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 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, and preferably 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.
10. Candidates should be aware of the reading list of suggested books for the RHS Level 2 Certificate in The Principles of Plant Growth, Propagation and Development which is available from the Qualifications Section and can also be found on the RHS website together with past papers.

#### Examiners' Comments:

- |    |    |  |              |
|----|----|--|--------------|
|    |    |  | <b>Marks</b> |
| 1. | a) | Describe <b>ONE</b> named example of biological control for a <b>NAMED</b> plant pest.   | <b>2</b>     |
|    | b) | State <b>TWO</b> benefits and <b>TWO</b> limitations of chemical and biological control methods by completing the table below: | <b>8</b>     |

		<b><i>Chemical Control</i></b>	<b><i>Biological Control</i></b>
<b><i>Benefits</i></b>	<b><i>1</i></b>		
	<b><i>2</i></b>		
<b><i>Limitations</i></b>	<b><i>1</i></b>		
	<b><i>2</i></b>		

- a) The majority of candidates were able to name a biological control for a named pest. Encarsia Formosa used to control Glasshouse Whitefly was a popular choice which was acceptable. Descriptions of the biology, how it is introduced, attacks and destroys the young immobile stages of the whitefly were rewarded.

- b) The better candidates avoided giving opposite examples in parallel columns and those candidates who provided eight different answers showed a very good understanding of the topic. Answers that gave some clarification were also rewarded; e.g. Chemical Control – easy to use by amateurs when bought as a ready mixed hand held spray. Statements such as storage and shelf-life, targeting of specific pests were all acceptable.
2. a) Name **TWO** examples of ephemeral weeds. 2
- b) State **TWO** disadvantages of ephemeral weeds in an herbaceous perennial border. 2
- c) Describe the action of the following types of herbicides, stating **ONE NAMED** active ingredient for **EACH**:
- i) contact; 2
- ii) translocated; 2
- iii) residual (soil acting). 2
- a) The majority of candidates were able to name examples of ephemeral weeds using their botanical names e.g. Senecio vulgaris and Cardamine hirsuta.
- b) This part of the question was answered well with disadvantages of ephemeral weeds including; unsightly, ability to self seed, constant disturbance of soil as regular weeding required being provided.
- c) Most candidates could accurately describe the different actions of the main types of herbicides but needed an up to date knowledge of the active ingredients as there are constant changes to approved chemicals. The best candidates were able to name diquat (contact), glyphosate (translocated) and flufenacet (residual).
3. a) Define the term 'plant pest'. 2
- b) Using a clearly labelled diagram outline the stages in the life cycle of the glasshouse whitefly. 6
- c) Name **TWO** different methods of controlling glasshouse whitefly. 2
- a) Candidates who stated that a plant pest causes physical damage to a plant and may cause secondary damage through the transmission of viruses etc. were rewarded.
- b) The better candidates included the four instar stages; (crawler, scale, third instar and pupa) of the larval phase of the glasshouse whitefly with a clearly labelled diagram.
- c) A range of acceptable methods were given which included; Encarsia formosa, the chemical deltamethrin, control of the weed Stellaria media etc.

4. a) Define the term 'plant physiological disorder'. 1
- b) Using **NAMED** plant examples describe how plant growth is affected by **EACH** of the following:
- i) frost; 2
  - ii) water-logging; 2
  - iii) drought. 2
- c) For **EACH** condition listed in b), describe **ONE** method used to minimise its effect. 3
- a) Candidates who included such details as damage not being caused by a pest or disease but by environmental factors e.g. wind, frost, drought etc. were rewarded.
- b) The best candidates gave a suitable plant example that was affected by the environmental factor and then described the damage caused. Candidates who also described the damage on a cellular level were rewarded.
- c) Candidates described a range of suitable methods used to minimise the effect of environmental factors on plants. Examples that were acceptable included fleece or glasshouse protection for frost, improve drainage or select appropriate plants for water-logging and irrigation or mulching for drought.
5. a) Describe the damage caused by powdery mildew on a **NAMED** garden plant. 3
- b) State **ONE** method of controlling powdery mildew. 1
- c) Describe **THREE** ways of minimising the risks to people and the environment when using chemical control methods. 6
- a) The best answers included a description of a white powdery coating on the leaves, discolouration and distortion of leaves, yellowing of leaves causing a reduction in photosynthesis, leaf drop, a reduction of growth etc. The botanical name of a suitable plant was required e.g. *Fragaria ananassa*.
- b) Suitable methods of control were given for powdery mildew and included; pruning, a reduction of high nitrate feeds, and improving air circulation.
- c) Nearly all candidates were able to provide ways of minimising risks when using chemical control and included; timing of application, use of PPE, safe disposal of chemicals and their containers, avoiding spraying on windy days, storing chemicals in their original containers and use of warning signs when spraying.

6. a) Name **FOUR** different pests of outdoor plants, and describe **ONE** distinctly different physical control method for **EACH**. 8
- b) State **TWO** factors that should be considered when selecting plants to avoid plant health problems. 2

a) The majority of candidates named four pests and described a range of physical control methods for each. The best answers included details of the control method e.g. rabbit fencing should be one metre high and buried 30 cm into the soil to prevent the rabbits from burrowing. A few candidates confused the difference between physical and cultural control methods.

b) Buying certified stock from a reputable nursery and selecting varieties that have a known resistance are all important when selecting plants to avoid plant health problems.

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