



**R2103**

**MAINTAINING PLANT HEALTH**

**Level 2**

**Monday 27 June 2011**

**14.30 – 15.10**

**Written Examination**

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

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

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

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

- i) The duration of this paper is **40 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) State **TWO** common garden practices that can disturb the natural balance of plant protection in a garden.

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- b) Describe what is meant by the following methods of pest and disease control:

- i) biological;
- ii) integrated;
- iii) cultural.

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- c) Name **ONE** example of a chemical control for a **NAMED** plant disease.

2

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Total Mark

Please see over .....

2. a) State **TWO** disadvantages of perennial weeds growing in a fine lawn.

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- b) Name **TWO** perennial weeds found in lawns and describe their biology.

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- c) Describe **TWO** distinct methods used to control perennial weeds.

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Total Mark

Please turn over .....

3. a) Using a clearly labelled diagram, outline the stages of the Black Bean Aphid's life cycle.

4

- b) Describe the damage caused by the Black Bean Aphid.

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- c) List **TWO** distinct control methods for Black Bean Aphid and state the seasonal timing of **EACH**.

4

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Total Mark
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Please see over .....

4. a) Define the term 'plant disease'. 2

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- b) Describe how damping off of seedlings can be minimised by good horticultural practice. 4

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- c) Describe the symptoms of Rose Black Spot and list **TWO** distinct methods of control. 4

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Total Mark
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Please turn over .....

5. a) Describe the symptoms of lime-induced chlorosis in **ONE NAMED** plant and list **ONE** way in which the condition can be overcome.

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- b) List **TWO** physiological disorders (other than lime-induced chlorosis), state the symptoms caused by the disorders and how these can be avoided by completing the table below:

6

Disorder	Symptom	Avoidance method

Total Mark

Please see over .....

6. a) Name **FOUR** factors that should be considered when selecting plants from retail horticultural outlets that can help to avoid plant health problems.

4

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- b) State **SIX** measures taken to minimise the health risks to humans when using plant pesticides.

6

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Total Mark
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**R2103**

## **MAINTAINING PLANT HEALTH**

**Level 2**

**Monday 27 June 2011**

<b>Candidates Registered</b>	868	<b>Pass with Commendation</b>	191 (26.94%)
<b>Candidates Entered</b>	709 (81.7%)	<b>Pass</b>	335 (47.25%)
<b>Absent/Withdrawn/Deferred</b>	159 (18.3%)	<b>Fail</b>	183 (25.81%)
<b>Total Candidates Passed</b>	526 (74.19%)		

### **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:

		Marks
1.	a) State <b>TWO</b> common garden practices that can disturb the natural balance of plant protection in a garden.	2
	b) Describe what is meant by the following methods of pest and disease control:	
	i) biological;	2
	ii) integrated;	2
	iii) cultural.	2
	c) Name <b>ONE</b> example of a chemical control for a <b>NAMED</b> plant disease.	2
	a) Most candidates showed an understanding of the importance of habitats to plant protection by providing appropriate garden practices. Acceptable examples included the removal of habitats that are hosts to beneficial insects i.e. hedges and composting diseased waste in a garden.	
	b) The best candidates included the use of parasites, predators and pathogens in their descriptions of biological control.	
	bii) The majority of candidates understood that integrated pest and disease control is the use of a number of different methods of control that do not harm each other with chemicals being used as a last resort.	

- biii)** Cultural control was described well by candidates and answers were qualified by relevant examples including crop rotation, good weed control and the selection of resistant cultivars.
- c)** A range of plant diseases were correctly named by candidates e.g. powdery mildew. Those that provided the active ingredient of the chemical controls were awarded full marks.
- 2.**
- a)** State **TWO** disadvantages of perennial weeds growing in a fine lawn. **2**
- b)** Name **TWO** perennial weeds found in lawns and describe their biology. **4**
- c)** Describe **TWO** distinct methods used to control perennial weeds. **4**
- a)** Most candidates were able to state two disadvantages of perennial weeds in a fine lawn e.g. that they are unsightly and that they compete for water and nutrients, which gained full marks.
- b)** The best answers included good descriptions of the biology of the weeds named e.g. *Plantago major* is a flat rosette type perennial that a mower can go over without harming. Descriptions also included details of the growth habit, method of reproduction and appearance of the weed to gain full marks. The botanical name for weeds is expected.
- c)** Those candidates who gave detailed descriptions of suitable methods used to control perennial weeds gained full marks. Herbicides needed to be current and approved and details of the timing and method of application were required.
- 3.**
- a)** Using a clearly labelled diagram, outline the stages of the Black Bean Aphid's life cycle. **4**
- b)** Describe the damage caused by the Black Bean Aphid. **2**
- c)** List **TWO** distinct control methods for Black Bean Aphid and state the seasonal timing of **EACH**. **4**
- a)** The best candidates provided clear diagrams and gave details of the life cycle of the black bean aphid including the winter host *Euonymus europaeus*. Further details provided included the generation of wingless females who give birth parthenogenetically to live females, the formation of winged females who mate with males to produce eggs to overwinter etc.
- b)** Candidates who described the effects of sap sucking by the black bean aphid rather than how the aphid feeds gained marks. Other damage described included the formation of sooty mould leading to photosynthesis being less effective, weakening the plant and the transfer of virus.
- c)** A range of control measures for Black Bean Aphid were given by candidates and included the removal of the soft growing tip of plants in mid-late spring, the use of organic or chemical control methods, autumn sowing of broad beans and the use of aphid predators. The seasonal timing for each was required for full marks.

4. a) Define the term 'plant disease'. 2
- b) Describe how damping off of seedlings can be minimised by good horticultural practice. 4
- c) Describe the symptoms of Rose Black Spot and list **TWO** distinct methods of control. 4
- a) Most candidates were able to define the term plant disease but needed to include all three causative organisms (fungi, bacteria and virus) to gain full marks.
- b) Descriptions including providing good ventilation, sowing seeds thinly, watering seedlings from below with clean water, using sterile containers etc. were awarded full marks.
- c) The majority of candidates described the symptoms of Rose Black Spot well and provided suitable control methods. Acceptable answers included; black spots on the foliage, premature leaf fall and purple-black spots on the stems. Control methods included; hand picking foliage, pruning of infected stems and the use of an approved chemical e.g. mancozeb.
5. a) Describe the symptoms of lime-induced chlorosis in **ONE NAMED** plant and list **ONE** way in which the condition can be overcome. 4
- b) List **TWO** physiological disorders (other than lime-induced chlorosis), state the symptoms caused by the disorders and how these can be avoided by completing the table below: 6

<i><b>Disorder</b></i>	<i><b>Symptom</b></i>	<i><b>Avoidance method</b></i>

- a) The best candidates named a suitable plant e.g. *Camellia japonica* and described the symptoms of lime-induced chlorosis well. These include yellowing between the veins of younger leaves first, leaf margins turning brown, scorching of yellow leaves by the sun and stunted growth of the plant. Suitable ways in which the condition can be overcome include; the application of sulphate of iron, magnesium or manganese sulphate or the application of an acidic mulch.

- b) The majority of candidates understood the meaning of the term physiological disorder and listed a range of disorders including; frost, drought, wind, waterlogging, nutrient deficiencies etc. Symptoms of each were well described but avoidance method was sometimes brief. Marks were not allocated when for example; apply nitrogen was stated as a method to overcome nitrogen deficiency. More suitable answers included the use of fleece or protect with a cloche to avoid frost damage.
6. a) Name **FOUR** factors that should be considered when selecting plants from retail horticultural outlets that can help to avoid plant health problems. **4**
- b) State **SIX** measures taken to minimise the health risks to humans when using plant pesticides. **6**
- a) Four factors were named by the majority of candidates and included; plants being pest and disease free, weed free, having vigorous growth and right plant right place. Selecting resistant cultivars and certified stock were not widely mentioned but very important.
- b) There was a wide range of acceptable answers to this question and most candidates were able to state six measures to minimise risks to humans when using plant pesticides. Measures given included personal protective equipment (which could only be counted once), spraying on windless days, keeping chemicals in their original containers, no eating smoking or drinking during work, avoidance of run off into water courses etc.

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