



Including Examiners Comments



**R3103**

**THE MANAGEMENT OF PLANT HEALTH**

**Level 3**

**Wednesday 19 June 2024**

**11:45 – 12:50**

**Written Examination**

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

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

**Centre Name:** .....

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

- i) The duration of this paper is **65** 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.







- c) State **FOUR** biosecurity measures to prevent the spread of Ash dieback (*Hymenoscyphus fraxineus*).

**4**

Total Mark

**Please turn over/.....**



















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## R3101 June 24 Examiner's Report

### General points:

Where a plant example is chosen, it is important to write the FULL botanic name and not just a partial name, following the correct naming protocols.

Where named plant examples are required, **common names are not credited** at level 3. Spellings of scientific terms and botanic plant names need to be full and accurate - poor spellings may be penalised.

Where a number of answers are asked for e.g. **THREE** environmental conditions, only the first three in a list will be marked.

### Q1. a)

Most candidates had a reasonable understanding of the symptoms of both mealy bug and two spotted spider mite, giving two appropriate symptoms for mealy bug such as severe infestations reducing plant vigour and premature leaf fall, with sooty mould building up on leaf surfaces due to the honey dew excreted by the mealy bug. For two spotted spider mite, appropriate symptoms included pale yellow mottling on the upper surface of leaves and fine silk webbing in severe infestations. For full marks specific details of symptoms were required.

**b)** Responses to this part of the question were varied; most candidates understood some elements of both spread and control of TSSM although the answers often lacked enough detail to gain full marks.

- i) TSSM can spread from plant to plant by air currents on webbing, by touch from other infested plants or on gardener's clothing and tools, or are able to move to adjacent plants through leaf litter. In almost all cases where candidates talked about the ideal environmental conditions for reproduction of TSSM they stated that "warm, dry conditions are needed" but did not state a temperature that defined this; in this situation "warm" is not deemed to be representative of the 27° C required and 'hot' was the expected descriptor.
- ii) Many could name the predatory mite *Phytoseiulus persimilis* as a suitable biological control but few candidates gave a good description of the control. Virtually no other options were shown for biological controls, suitable alternatives would be *Amblyseius californicus*, another predatory mite, *Feltiella acarsuga*, a predatory midge or *Atheta coriaria*, a predatory rove beetle.

**c)** Most candidates named a suitable chemical control method such as plant oils, plant invigorator or pyrethrum but some answers were lacking in detail of the method and timing of application.

## **Q2.**

- a)** Symptoms of Ash Dieback Disease were presented by most candidates with the most common responses being 'cankers on stems' which some linked to 'necrotic girdling of stems' with various descriptions of how the crown of the tree dies back, and some stated that the whole tree would eventually die. Other symptoms are black diamond shaped lesions on leaves. Very few candidates mentioned the fungal fruiting bodies on dead foliage and stems, internal blackening of the wood or epicormic growth below the canker on the stem.
- b)** Spread of the disease was fairly well evidenced in terms of knowing the mechanism of spread, i.e. 'spores blown on the wind' or 'spores splashed by rain' but no detail was given about the type of spore being discussed (sexual and asexual respectively). Many candidates discussed spread by movement of infected material, spores on tools, clothing, vehicles etc. which was also credited.
- c)** Biosecurity measures included reporting the suspected outbreak to The Forestry Commission or Animal and Plant Health Authority. Many candidates understood that infected plants and material should not be transported off site and stated that the material should be burnt on site. The need to sterilise any possible method of transfer by vehicle or footwear was well understood.

### Q3.

a) The issue of couch grass having rhizomes that can break and regrow into new plants was well understood, but was not always related to how this then caused difficulties in their removal, with many candidates completely ignoring the fact that the question was related to a herbaceous border and that the roots of the couch grass can become entangled in the roots of the desired herbaceous plants, thus making it almost impossible to remove completely by forking or hand weeding and also potentially causing damage to the herbaceous plants in the process. Application of any herbicides would have to be very precise with careful spot treatment to minimise damage to herbaceous plants in the border.

### b)

- i) Most candidates highlighted that digging out the rhizome was the best method of control in uncultivated areas, with most detailing the difficulties of doing so and that small sections that get left behind will reestablish as a new plant. A small number of candidates mentioned the use of a light blocking membrane pegged out over the infected area and importantly highlighted the need for this to remain in place for at least a year.
- ii) Chemical control with Glyphosate was well understood by most candidates but answers were mostly limited in their detail of application. The herbicide should be sprayed when grass is in active growth, 10-15cm high, with repeat treatment as soon as regrowth is seen.

c) Most candidates named two alternative weeds commonly found in an allotment situation. However, whilst anything normally accepted as a weed would be credited marks it should be understood that due to the nature of an allotment being regularly tended and the soil regularly turned it is most likely that the most common weeds will be annuals such as *Cardamine hirsuta* or *Poa annua*.

**Q4. a)**

- i) Stem and bulb eelworm has a complex 5 stage life cycle; however, the question did not call for the stages of the lifecycle to simply be stated, but for the lifecycle to be described. Relevant information such as male and female nematodes live within the plant tissue, breeding takes place inside the living host plant, females can lay up to 500 eggs, which can remain dormant for many years, these hatch into juveniles which move through the film of water in the soil to infest new host plants via their roots, and at optimum temperature (15°Celsius) the length of life cycle is 21 days was all credited. In general, this part of the question was poorly answered..
- ii) Candidates had a better knowledge of the symptoms of S&BE but responses were limited and not very accurate or descriptive. Many highlighted distorted growth with some stating loss of vigour; yellow blotches on leaves were mentioned by some as was necrosis (rot / rotting also accepted) of the bulb. However, other possible symptoms such as streaking in flowers, secondary crown rot, swellings on leaves, blackish markings between veins and purpling of foliage were not mentioned.

**b)** This was the best answered section of the question and most candidates could state at least two methods of the four required for the control of S&BE. Methods included selecting certified pest free stock and resistant varieties, using rotation of crops, not planting hosts known to be susceptible to S&BE for at least 4 years, destroying infested plants by burning, and general good hygiene measures. Details were required for full marks when discussing heat treatments (3 hours at 44°Celsius) and were not generally given by candidates. Steam sterilisation of soils was only mentioned occasionally and avoidance of overhead irrigation was not discussed by any candidates.

**Q5. a)** Many candidates were able to offer two suitable sources of information related to the safe use of pesticides. Product label, COSHH assessment, LERAP assessment, FERA, COPR, Plant Protection Code of Practice, and manufacturer's website are all acceptable answers.

**b)** The scope for answers within this part of the question was very broad and whilst many candidates were able to provide some correct responses, few scored highly. Most common responses given were risk assessment, checks of equipment to ensure it is in good working order, COSHH assessments, weather, PPE choice and various ways to describe carrying out some form of assessment of the environmental risk. Other correct answers could have included an assessment of the risk to public, risk to pets and wildlife, operator exposure, site assessment and LERAP assessment.

**Q6. a)** It appears that candidates had limited knowledge of Fireblight overall and most could not clearly state the symptoms that would be expected with this disease (one candidate's answer seemed to relate to a pest).

Some candidates stated that the leaves would turn brown followed by early leaf fall when in fact the opposite is true, the leaves turn black and are retained on the tree giving the appearance of being scorched, shoots also shrivel and they usually take on a shape reminiscent of a shepherd's crook. Blossoms wilt and die, slimy white exudate, foxy brown staining of the wood, and cankers and areas of sunken bark were also mentioned by some candidates but in most cases just one or two were given.

**b)** Again, the answers to this part of the question were not detailed enough to score well. Candidates needed to review the range of physical and cultural methods available. Very few highlighted that fact that there is no chemical control available (however some suggested chemical applications, including pesticides). Monitoring to detect early infection is very important for early treatment. Some candidates gained marks for simple statements such as use resistant plants, cut out and burn, prune affected parts etc. but these were not sufficient to gain full marks. A fuller statement would be to cut into healthy wood well below staining, remove infected wood and burn, disinfect pruning tools between cuts. Sterilisation of tools and equipment was mentioned by some, again simply stating tools should be cleaned was not sufficient.