

## Assessment Schedule – 2015

### Agricultural and Horticultural Science: Demonstrate knowledge of horticultural plant management practices and related plant physiology (90924)

#### Assessment Criteria

#### Question One: Glasshouses

Not Achieved		Achievement		Achievement with Merit		Achievement with Excellence	
		Describes how plant management practices are carried out.		Links ideas to explain why plant management practices, or steps within practices, are carried out.		Applies knowledge of plant management practices to given situations. This may involve <b>comparing and contrasting</b> or <b>justifying</b> management practices.	
N1	N2	A3	A4	M5	M6	E7	E8
Describes ONE idea at Achievement level.	Describes TWO ideas at Achievement level.	Describes THREE ideas at Achievement level.	Describes FOUR ideas at Achievement level.	Explains THREE ideas at Merit level.	Explains FOUR ideas at Merit level.	Justifies the method chosen.	Fully justifies the method chosen by comparing and contrasting.

**N0** = No response; no relevant evidence.

#### Examples of evidence for answers

**Describes** (Achievement) management practices carried out in glasshouse / **Explains** (Merit) how these affect plant processes

Management practice (Achievement)	Effect on plant process (Merit)
Venting.	Avoidance of over-heating prevents denaturing of plant's enzymes, which allows <b>all plant processes</b> to occur. Increases air movement, which reduces humidity but increases the rate of transpiration.
CO <sub>2</sub> enrichment.	CO <sub>2</sub> is one of the reactants for photosynthesis, and any increase in the amount of reactants will increase the rate of <b>photosynthesis</b> .
Heating or cooling.	Maintaining <b>optimum temperature</b> means that both <b>photosynthesis</b> and <b>respiration</b> are carried out at maximum rate.
Increase lighting.	Light provides energy for <b>photosynthesis</b> to occur, so increasing light will increase photosynthesis.
Increase humidity.	Increasing humidity decreases <b>transpiration</b> .

**Note:** Other management practices acceptable are training, pest and disease control, irrigation, and nutrient application.

**Describes** (Achievement) how glasshouses alter growing conditions / **Explains** (Merit) explains what effect this has on tomato production / **Compares and contrasts** (Excellence) the growing conditions for tomatoes inside and outside glasshouses

<b>Glasshouse</b>	<b>Outdoors</b>
<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• Temperature / water / humidity (A).</li> <li>• Consistent harvest date; earlier harvest; fruit of consistent size (M).</li> <li>• Easier to control pests (A), as outside pests can be prevented from accessing fruit (M).</li> <li>• Easier to manage plants (A) / plant training structures can be built in (M).</li> <li>• Safe from storms / adverse weather (A), which means harvests of higher quality, and can grow tomatoes all year round (M).</li> </ul>	<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• Cheaper (A), as capital costs are not large (M).</li> <li>• Good public perception (A), as it is seen as more natural (M).</li> <li>• Can be grown on a small scale (A).</li> </ul>
<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• Higher costs (A), as large structures need to be built (M).</li> <li>• Not efficient for small-scale production (A).</li> <li>• Maintenance and operating costs are high (A), as glasshouses need ongoing maintenance, including frequent repairs.</li> </ul>	<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• Cannot control growing conditions (A), which can result in poor quality / loss of fruit (M).</li> <li>• Plant management is difficult (A), as stakes and frames need to be assembled each year (M).</li> <li>• Labour costs are high (A), as more people are needed to maintain plants (M).</li> <li>• Susceptible to storms / adverse weather conditions (A), which can result in loss of fruit.</li> <li>• Susceptible to birds (A), resulting in loss of fruit / reduced harvest (M).</li> </ul>

**Question Two: Citrus**

Not Achieved		Achievement		Achievement with Merit		Achievement with Excellence	
Describes how plant management practices are carried out.				Links ideas to explain why plant management practices, or steps within practices, are carried out.		Applies knowledge of plant management practices to given situations. This may involve <b>comparing and contrasting</b> or <b>justifying</b> management practices.	
N1	N2	A3	A4	M5	M6	E7	E8
Describes ONE idea at Achievement level.	Describes TWO ideas at Achievement level.	Describes THREE ideas at Achievement level.	Describes FOUR ideas at Achievement level.	Explains THREE ideas at Merit level.	Explains FOUR ideas at Merit level.	Justifies the method chosen.	Fully justifies the method chosen by comparing and contrasting.

N0 = No response; no relevant evidence.

**Examples of evidence for answers**

**Describes** (Achievement) pruning actions related to plant health / **Explains** (Merit) how these actions ensure plant health

Description (Achievement)	Explanation (Merit)
Sterilise pruning equipment.	To prevent spread of disease from tree to tree.
Timing of pruning.	To avoid frost damage to flush growth. Avoid pruning at flowering to protect crop load.
Avoid over-pruning.	Removing too many leaves reduces photosynthesis capability.
Painting wound.	Prevent pest access to wound.
Removal of pruned branches.	Remove potential host sites for pests.
Prune to outward-facing bud.	Encourages outward growth. Allows more light in. Allows air circulation to reduce pest and disease settlement.

**Note:** Other practices such as removal of dead and diseased branches, and their impact on plant health, will also be considered.

**Describes** (Achievement) / **Explains** (Merit) / **Justifies** (Excellence) the use of biological control over the use of insecticides

<b>Biological control</b>	<b>Insecticides</b>
<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• No spray residue (A), so no withholding period on harvest (M).</li> <li>• Once set up, fewer ongoing costs (A), so the grower's profit is greater (M).</li> <li>• Kills only target insects (A), so beneficial insects are unaffected (M).</li> <li>• Less labour-intensive (A), so growers' expenses are less (M).</li> <li>• Good public perception (A), so fruit can be sold for a higher price (M).</li> </ul>	<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• Works quickly (A), so less damage to fruit / trees (M).</li> <li>• Highly effective (A), so less damage to fruit / trees (M).</li> <li>• Consistent (A), so grower has more predictable harvests (M).</li> <li>• Simple method (A), so workers require less training (M).</li> </ul>
<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• Takes a long time for research and development (A), so there is some loss of fruit until an appropriate bio-control is found (M).</li> <li>• Expensive initially (A), which can reduce profit (M).</li> <li>• Never 100% effective.</li> <li>• Not consistent.</li> </ul>	<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• Sprays are weather-dependent (A).</li> <li>• Labour-intensive (A), so reduces profit (M).</li> <li>• Negative public perception (A), which means fruit can be worth less (M).</li> <li>• Withholding period on harvest.</li> <li>• Pest resistance.</li> <li>• Can kill non-target insects.</li> <li>• Has to be repeated every year.</li> </ul>

**Question Three: Establishing trees**

Not Achieved		Achievement		Achievement with Merit		Achievement with Excellence	
Describes how plant management practices are carried out.				<b>Links</b> ideas to explain why plant management practices, or steps within practices, are carried out.		Applies knowledge of plant management practices to given situations. This may involve <b>comparing and contrasting</b> or <b>justifying</b> management practices.	
N1	N2	A3	A4	M5	M6	E7	E8
Describes ONE idea at Achievement level.	Describes TWO ideas at Achievement level.	Describes THREE ideas at Achievement level.	Describes FOUR ideas at Achievement level.	Explains THREE ideas at Merit level.	Explains FOUR ideas at Merit level.	Justifies the method chosen.	Fully justifies the method chosen by comparing and contrasting.

N0 = No response; no relevant evidence.

**Examples of evidence for answers**

**Describes** (Achievement) actions that can be taken at planting / **Explains** (Merit) how these improve survival and/or growth

Description (Achievement)	Explanation (Merit)
Add slow-release fertiliser.	Slow release needed to avoid burning roots.
Stake before planting.	So as not to damage roots / prevent wind damage.
Use mulch.	Prevent weeds competing / reduce water loss.
Soak the root ball.	Ensure roots are hydrated and avoid roots drying out.
Hole should be larger than the root ball.	Allows for drainage and root penetration.
Break up the bottom of the hole.	Increases drainage and root penetration.

**Note:** Other management practices – environmental deliberations such as wind protection, large animal protection, and placement of tree based on environmental factors which are applied at the time of planting – will also be considered if they impact on tree survival.

**Describes** (Achievement) ways in which weeds can affect plant growth / **Explains** (Merit) by linking each description to plant processes

Weeds:

- compete for space
- compete for water
- act as host to pests
- compete for light (only for Achieved, as weeds are not usually tall enough during establishment phase to shade trees and affect photosynthesis)
- compete for nutrients.

Links above to plant processes: photosynthesis, respiration, or transpiration, and specific nutrients to specific plant processes – i.e. weeds compete for nutrients (Achievement) which are essential for plant processes/chemical processes (Merit).

**Describes** (Achievement) / **Explains** (Merit) / **Justifies** (Excellence) why one method is better than the other method

<b>Mulches</b>	<b>Herbicides</b>
<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• Reduces soil water loss (A), so that less expensive irrigation needs to be used (M).</li> <li>• Adds nutrients (A), so that less fertiliser needs to be used (M).</li> <li>• Adds organic matter (A), which improves the soil (M).</li> <li>• Stops weeds from growing (A), which reduces competition (M).</li> <li>• Protects soil.</li> <li>• Increases soil temperature.</li> </ul>	<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• Generally cheaper, especially for large-scale use (A), so the grower's profit is greater (M).</li> <li>• Easy to apply (A), so workers require less training (M).</li> <li>• Stops weeds from growing (A), which reduces competition (M).</li> <li>• Can be easily upscaled from backpack to tractor, for faster/higher production.</li> </ul>
<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• Difficult and expensive for large-scale use.</li> <li>• Harder to apply.</li> <li>• Slower.</li> <li>• Can cause collar rot.</li> <li>• Ineffectual if not applied correctly.</li> <li>• Can be washed away.</li> </ul>	<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• Can be a health risk for operators.</li> <li>• Public perception.</li> <li>• Risk for non-target plants.</li> <li>• Weather-dependent.</li> <li>• Can get into waterways.</li> </ul>

**Cut Scores**

<b>Not Achieved</b>	<b>Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>
0 – 6	7 – 12	13 – 18	19 – 24