

## Assessment Schedule – 2016

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

#### Assessment Criteria

#### Question One: Pests and diseases

Not Achieved		Achievement		Achievement with Merit		Achievement with Excellence	
		<b>Describes</b> horticultural plant management practices and related plant physiology and /or growing conditions.		<b>Links</b> ideas to <b>explain</b> why horticultural plant management practices, or steps within practices, are carried out.		<b>Applies knowledge</b> of horticultural 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.

#### Evidence Statement

<p><b>Describes</b> (Achievement) <u>methods for controlling white cabbage butterfly caterpillars.</u></p> <ul style="list-style-type: none"> <li>• Biological control/using natural predators.</li> <li>• Insecticides /chemical sprays.</li> <li>• Physically removing the caterpillars.</li> </ul> <p><b>Describes</b> (Achievement)/ <b>Explains</b> (Merit) <u>the effect of parasites on plant growth.</u></p> <ul style="list-style-type: none"> <li>• Removes leaf surface area (Achievement), which reduces the rate of photosynthesis (Merit).</li> <li>• Damages plant leaves /stem (Achievement), which can allow disease into the plant (Merit).</li> <li>• Consumes plant resources /sucks sap (Achievement), which means less is available for plant processes /respiration (Merit).</li> </ul>
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**Describes** (Achievement) / **Explains** (Merit) / **Justifies** (Excellence) the use of Integrated Pest Management (IPM) to control fungal disease.

- For IPM, a grower uses a combination of physical, biological, and chemical methods to prevent or control pests and diseases (Achievement), which allows the plant to devote more of its resources to growth and reproduction (Merit). This means that the plant will grow faster and produce more/better quality fruit (Merit).
- The use of IPM reduces the amount of spraying (Achievement), which reduces the cost of pest control (Merit).

**Integrated pest management**

*Advantages*

- Better growth.
- Higher-quality fruit.
- Less impact on beneficial organisms.
- Fewer environmental impacts.
- Diseases are less likely to spread to other plants.

*Disadvantages*

- More labour-intensive.
- More effort/knowledge required.
- Withholding period for chemicals.

**Question Two: Plant training**

Not Achieved		Achievement		Achievement with Merit		Achievement with Excellence	
		<b>Describes</b> horticultural plant management practices and related plant physiology and /or growing conditions.		<b>Links</b> ideas to <b>explain</b> why horticultural plant management practices, or steps within practices, are carried out.		<b>Applies knowledge</b> of horticultural 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**

<p><b>Describes</b> (Achievement)/ <b>Explains</b> (Merit) the plant training techniques.</p> <ul style="list-style-type: none"> <li>• Disbudding – removal of the lateral buds (Achievement); it is carried out to encourage the plant to put more energy into the terminal bud /remaining buds, to get fewer but higher-quality fruit /flowers (Merit) or to get upward growth (Merit).</li> <li>• Stopping – removal of terminal bud (Achievement) makes plant invest more energy into the side shoots and gives a bushier plant (Merit).</li> <li>• Thinning – removal of some fruit (Achievement) to get a smaller number of bigger, better-quality fruit (Merit). Removal of side branches (Achievement) to improve air movement and reduce fungal disease (Merit) for visual or aesthetic appeal (Merit).</li> <li>• Staking – providing artificial support (Achievement) to protect plants from weather and to train plants to grow upwards/straight (Merit).</li> </ul>
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**Describes (Achievement) / Explains (Merit) / Compares and contrasts (Excellence) the two training techniques.**

- Training increases airflow through plant (Achievement) to prevent disease/pests (Merit), and to improve the quality or quantity of flowers and fruit (Merit).
- It increases light to the centre of the plant (Achievement), improving photosynthesis and reducing the likelihood of fungal/bacterial disease (Merit).
- It changes the plant's shape/gives a more desirable shape (Achievement), so makes harvest easier/improves landscaped look (Merit).

<b>Espalier training</b>	<b>Central Leader training</b>
<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• Allows a greater number of fruit trees to fit in a small garden.</li> <li>• Trains the plant to fit in a particular place.</li> <li>• Warmth from wall can prolong growing season.</li> <li>• Looks attractive.</li> <li>• Easier access for picking, spraying, monitoring etc.</li> </ul>	<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• Takes less skill/effort.</li> <li>• Can have higher productivity, as more new growth is kept and those have been selected for vigour.</li> <li>• Bottom branches have good light access, which improves overall fruit ripening.</li> </ul>
<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• Takes more effort/skill.</li> <li>• Can have lower productivity per plant.</li> <li>• Not all fruit tree varieties are suitable to be trained in this way.</li> </ul>	<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• Takes up more space.</li> <li>• Can be unattractive.</li> </ul>

**Question Three: Water**

Not Achieved		Achievement		Achievement with Merit		Achievement with Excellence	
		<b>Describes</b> horticultural plant management practices and related plant physiology and /or growing conditions.		<b>Links</b> ideas to <b>explain</b> why horticultural plant management practices, or steps within practices, are carried out.		<b>Applies knowledge</b> of horticultural 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.

**Evidence Statement**

<p><b>Describes / Identifies</b> (Achievement) plant structures and processes involved in transpiration.</p> <ul style="list-style-type: none"> <li>• Root hairs – osmosis</li> <li>• Xylem – capillary action</li> <li>• Stomata/guard cells – evaporation</li> </ul> <p><b>Writes</b> word equation for photosynthesis (Achievement).</p> $\begin{array}{c} \text{light} \\ \text{carbon dioxide + water} \rightarrow \text{glucose + oxygen} \\ \text{chlorophyll} \end{array}$ <p><b>Describes</b> (Achievement) / <b>Explains</b> (Merit) ways in which the rate of photosynthesis can be increased.</p> <ul style="list-style-type: none"> <li>• More light (Achievement) increases the energy available to drive photosynthesis (Merit).</li> <li>• Increase carbon dioxide (Achievement) to provide more substrate/raw material for photosynthesis (Merit).</li> <li>• Increase temperature (Achievement) to speed up chemical reactions (Merit).</li> </ul>
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**Describes** (Achievement) / **Explains** (Merit) / **Justifies** (Excellence) why one irrigation method is a better option than the other.

Water is needed for plant processes such as respiration, photosynthesis, and transpiration, and for cell turgidity.

<b>Sprinklers</b>	<b>Dripline irrigation</b>
<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• Easy to set up (Achievement), which means less labour/less knowledge required (Merit).</li> <li>• Easy to move around (Achievement), which means it can be taken out of the way of machinery/used somewhere else (Merit).</li> <li>• Can be used for frost protection/dual purpose.</li> </ul>	<p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• Less wasteful (Achievement), so better for environment/less cost for water (Merit).</li> <li>• Water doesn't get on leaves/fruit (Achievement), so fruit is not water-damaged/reduced disease (Merit).</li> <li>• Nutrients can be added.</li> <li>• Lower cost to run.</li> <li>• Water is applied only where it needs to be/root zone (Achievement), so better for environment/less cost for water (Merit).</li> <li>• Consistent amount of water per vine.</li> </ul>
<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• Water can damage fruit/leaves.</li> <li>• Wasteful of water/more water lost through evaporation.</li> <li>• Greater chance of uneven distribution.</li> <li>• More expensive to run.</li> <li>• Water is lost on windy days.</li> </ul>	<p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• More easily damaged by mowers/pickers.</li> <li>• More difficult to install.</li> <li>• Can't be used as frost protection.</li> <li>• Higher maintenance costs.</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