

Assessment Schedule – 2021

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

Assessment Criteria

Achievement	Achievement with Merit	Achievement with Excellence
Describes horticultural plant management practice and related plant physiology and / or growing conditions.	Links ideas to explain why horticultural plant management practices, or steps within practices, are carried out.	Applies knowledge of horticultural plant management practices to given situations. This may involve comparing and contrasting or justifying management practices.

Evidence

Question ONE	Sample evidence	Achievement	Achievement with Merit	Achievement with Excellence
(a)	<ul style="list-style-type: none"> Use a fork to turn over soil <u>to break up topsoil and add organic matter into the soil.</u> Break up the soil clumps with a spade <u>to create a fine soil for a seed bed, and increase seedling emergence.</u> Remove existing weeds <u>to reduce competition for water and nutrients and improve seedling growth.</u> Rake the soil <u>to create a level seed bed.</u> <u>Add fertiliser to ensure soil contains the nutrients needed for plant growth.</u> 	Describes cultivation actions.	Describes cultivation actions and explains why it is carried out, including <u>underlined</u> -type evidence.	

	Sample evidence	Achievement	Achievement with Merit	Achievement with Excellence
(b)	<ul style="list-style-type: none"> Controls the amount of water that the plant has access to, <u>which allows the plant to carry out photosynthesis and transpiration.</u> Increases the humidity of the environment, <u>reducing water loss from the plant through transpiration.</u> Decreases the temperature that the seedlings grow in, <u>reducing the risk of water loss and wilting.</u> <u>Mist is less harsh on the seedling and therefore minimises damage to the delicate stems and leaves.</u> 	Describes what a misting house does.	Explains why a misting house would be used to grow seedlings, including <u>underlined</u> -type evidence.	
(c)	<ul style="list-style-type: none"> Mulch is a form of organic matter and is darker in colour <u>so adding it to soil increases the soil temperature.</u> <u>Increased temperature in soils increase the rate of reaction for plant growing processes, so increases the growth rate / crop yield of plants.</u> Pea straw, as an organic mulch is light in colour, <u>it prevents the soil becoming too hot and helps to prevent water loss through evaporation.</u> Mulch prevents water evaporation from the surface, <u>which increases the water availability in the soil and more water can be used for transpiration and photosynthesis.</u> Mulch is organic matter and therefore holds water, <u>improving the water holding capacity and meaning more is available for dissolving and taking up nutrients, preventing plant growth being limited by lack of nutrients.</u> Mulch is organic matter, <u>and therefore when broken down increases soil fertility, which increases plant growth.</u> 	Describes a benefit of using organic mulch.	Explains the benefit of using organic mulch, including <u>underlined</u> -type evidence.	Justifies the benefit of using organic mulch. <i>Note: for E7/E8 candidates justify the use of organic mulch by considering the impact on soil temperature and plant growing processes.</i>

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 given method.	Justifies the given method, in a well-considered answer.

N0 = No response; no relevant evidence.

Question TWO	Sample evidence	Achievement	Achievement with Merit	Achievement with Excellence
(a)	<p>Note: <i>sunshine / light, nutrients and sowing depth are not accepted.</i></p> <ul style="list-style-type: none"> • A warm / mild temperature <u>needed to speed up the plant processes which occur in the seed.</u> • Access to water <u>needed for reactions that happen in the cell.</u> • Access to oxygen, <u>which is required for respiration, and allows the plant to create energy.</u> 	<p>Describes the conditions needed for germination.</p>	<p>Describes the conditions needed for germination and explains why, including <u>underlined</u>-type evidence.</p>	
(b)	<ul style="list-style-type: none"> • Capsicums are native to warm, humid climates <u>and controlling the humidity allows the growers to replicate that.</u> • <u>Warmer temperature allows for faster growth because it speeds up the rate of reactions in plant processes like photosynthesis and respiration.</u> • Warm, humid conditions prevent the plants going to seed <u>and promotes fruit maturity.</u> • Humid environments have more water in air, <u>which means that transpiration will occur at a slower rate.</u> • Higher humidity increases the growth of fungi and pathogens, which can have a negative impact on the growth of capsicums. 	<p>Describes why growers need to control humidity when growing indoors.</p>	<p>Explains why growers need to control humidity when growing indoors, including <u>underlined</u>-type evidence.</p>	
(c)	<p>Natural light <i>Advantages</i></p> <ul style="list-style-type: none"> • Cheaper as you do not need to pay for the cost, installation or running of the lights. • Can be done on a larger scale, <u>increasing the yield and profit.</u> • <u>Increases the rate of photosynthesis, which means that the plants or fruit growth rate increases.</u> <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> • Weather dependent, <u>and light could be decreased or less during some times of the year, slowing crop growth.</u> • Growing temperature is also dependent on the weather; <u>changes during different seasons affect the reaction rates and plant growth / fruit maturity.</u> 	<p>Describes the light conditions.</p>	<p>Describes the light conditions and explains why, including <u>underlined</u>-type evidence.</p>	<p>Justifies the best light conditions. Note: <i>for E7/E8 candidates must consider plant processes and overall crop yield while comparing and contrasting grow lights with natural light.</i></p>

<p>Growing lights</p> <p><i>Advantages</i></p> <ul style="list-style-type: none"> • Artificial light often provides heat as well, <u>which increases the reaction rate in plant growing processes.</u> • <u>Able to control the intensity of light to suit production needs.</u> • Can be used all year around and is not affected by change in seasons or weather. • More light <u>allows an increased rate of photosynthesis and faster plant growth.</u> <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> • High cost involved in both establishment and running. • Can be done only on a smaller scale. 			
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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.	Justifies the method chosen by comparing and contrasting with another method.

N0 = No response; no relevant evidence.

Question THREE	Sample evidence	Achievement	Achievement with Merit	Achievement with Excellence
(a)	<ul style="list-style-type: none"> Rose buds are pinched off with the thumb nail <u>to ensure that no damage is done to other rose buds, or parts of the plant.</u> This reduces the quantity of roses that are grown <u>and increases the quality of roses produced.</u> 	<p>Describes how disbudding is carried out on roses.</p>	<p>Explains why disbudding on roses, including <u>underlined-type</u> evidence.</p>	
(b)	<ul style="list-style-type: none"> Aphids are sap suckers <u>and remove the water and nutrients from the plant, which weakens the plant and makes it more prone to disease.</u> Pests damage the plant, <u>weakening it and decreasing the quality of the flower produced.</u> 	<p>Describes how pests impact the growth of roses.</p>	<p>Explains how pests impact the growth of roses, including <u>underlined-type</u> evidence.</p>	
(c)	<p>Liquid fertiliser <i>Advantages</i></p> <ul style="list-style-type: none"> Effective for flowering plants and can help improve flowering quality, therefore increasing the number of pollinators. <u>The more colourful and fragrant the flower, the more pollinators it will attract.</u> In a liquid form, nutrients can be taken up immediately <u>and used by the plant.</u> <u>Liquid fertiliser does not require rain or irrigation to dissolve fertilisers.</u> <u>It can be added to irrigation systems and easily spread.</u> <u>Liquid fertiliser will be higher in phosphorus, as it helps the plant to convert other nutrients into usable building blocks to aid growth.</u> <u>The stronger and healthier the plant, the more likely it can ward off pathogens.</u> <u>Potassium will promote large vibrant flowers.</u> Iron will deepen the flowers' colour. Magnesium promotes deep green foliage. <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> It is costly. <u>In outdoor environments it can be more easily leached, particularly during heavy rainfall.</u> <u>It doesn't last as long in soil so needs to be applied more regularly.</u> 	<p>Describes a fertiliser type.</p>	<p>Explains why a fertiliser type is better, including <u>underlined-type</u> evidence.</p>	<p>Justifies the choice of a fertiliser type by comparing it with the other type.</p> <p>Note: for E7/E8 candidates must consider plant structure and growth, nutrient availability, and plant uptake, and recommend the better option by comparing it with the other.</p>

<p>Granular fertiliser</p> <p><i>Advantages</i></p> <ul style="list-style-type: none"> • Granules are slowly dissolved in soil <u>so last longer and gradually release their nutrients for plant uptake.</u> • It is less expensive. <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> • The granules need to be dissolved before they can be taken up by the plant, <u>so rainfall or irrigation is needed after the fertiliser has been applied.</u> • Can be washed or blown away. 	
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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.	Justifies the method chosen by comparing and contrasting with another method.

N0 = No response; no relevant evidence.

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 6	7 – 12	13 – 18	19 – 24