

Assessment Schedule – 2023**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 practices 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	Evidence	Achievement	Achievement with Merit	Achievement with Excellence
(a)	<ul style="list-style-type: none"> Shelters help to increase humidity. They reduce wind. A shelter increases temperature. They provide shade. 	Describes why growers would use shelter belts in an orchard.		
(b)	<ul style="list-style-type: none"> Increased humidity will reduce water loss, <u>so the plant will suffer less water stress</u>. Reduced wind means less physical damage <u>to leaves, flowers, and fruit</u>. A shelter means there is less evaporation of water, so less irrigation is required. <u>The plant will suffer less water stress, and growth will be more regular</u>. Increased temperature means faster growth of the plant, <u>initiation of flowering, and better fruit ripening</u>. Reduced wind increases bee numbers <u>so more bees pollinate so more fruit produced, or in the example of kiwifruit, larger fruit produced</u>. <u>Shelter belts can harbour pests and disease that can damage the crop</u>. 	Explains how a shelter belt improves the growth and production of horticultural crops. Makes few links.	Explains how a shelter belt improves the growth and production of horticultural crops, makes links, <u>underlined</u> -type evidence.	

(c)	<p><i>Artificial shelters</i></p> <ul style="list-style-type: none"> Artificial shelter is faster to establish and will have instant impact on crop, <u>because of this the grower will see improvement in this crop growth and yield immediately.</u> Apart from maintenance from rips, there is little the grower needs to do, <u>which will save costs in the long run.</u> Not much shade to <u>impact on the growth of the crop</u> and little land use means there is <u>more room to grow the desired crop</u>, no irrigation or pest and disease (P&D) control issues will save the grower money and <u>mean there is less competition for the crop they are growing.</u> Expensive for initial set up. <p><i>Natural shelters</i></p> <ul style="list-style-type: none"> Natural shelter will take time to establish (years), <u>which will mean that for some time, the growth of the crop will not be optimised.</u> Natural shelter belts are wider, <u>taking up more land.</u> It will need regular pruning, watering, fertilising, and harbours P&D, <u>which will be extra costs in the production of the crop, as well as being competition for water and nutrients.</u> The initial cost is cheaper, which might be the only thing the grower can afford at crop establishment, and it is less visually ugly so the neighbours will be happier. 	<p>Chooses a natural or artificial shelter belt and explains which option is best.</p> <p>Doesn't cover all factors or provides little comparison.</p>	<p>Chooses a natural or artificial shelter belt and explains which option is best, makes links, <u>underlined-type</u> evidence.</p> <p>Some factors covered off.</p>	<p>Chooses a natural or artificial shelter belt and explains which option is best. Compares it with another to justify choice.</p> <p>Considers three factors.</p> <p>Note: E7 / E8 candidates justify the use.</p>
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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 chosen method.	Justifies the chosen method by comparing and contrasting with another method.

N0 = No response; no relevant evidence.

Question TWO	Evidence			Achievement	Achievement with Merit	Achievement with Excellence
(a)		Steps	How each step is carried out	Describes steps a grower would take from 'existing crop' through to 'ready for sowing'. 2xA only.		
	1	Spray existing cover	Using a truck sprayer, driven over the ground.			
	2	Plough with discs	Traditional discs towed behind a tractor to turn over the soil			
	3	Harrow with chains	Harrows will break up the turned-over soil and level			
(b)	<ul style="list-style-type: none"> • Spraying of weed • s and burying of weeds will decrease competition <u>and increase soil organic matter.</u> • <u>Increased soil organic matter adds to water holding capacity (WHC), aeration, and nutrients.</u> • Cultivated to a fine tilth and consolidated allows for control of seed depth at sowing and ensures good contact between soil particles and the seed, <u>which leads to better germination rates.</u> • Soils are levelled, <u>which will minimise wet and / or dry spots.</u> • Compaction can be alleviated to allow for better aeration of soil <u>so plants will absorb water and nutrients better, leading to better plant growth.</u> 			Explains how the growing conditions for plants are improved by cultivating soils.	Explains how the growing conditions for plants are improved by cultivating soils, makes links, including <u>underlined</u> -type evidence.	
(c)	<p><i>Base dressing</i></p> <ul style="list-style-type: none"> • Base dressing (after a soil test) lifts and repairs nutrient levels to expected levels, <u>but a heavy application might over-bear young seedling roots and leach beyond the root zone before plants have used it.</u> • Generally, base dressing is the cheaper option to apply <u>as a truck can be used and it is applied only once.</u> <p><i>Side dressing</i></p> <ul style="list-style-type: none"> • Side dressings are applied to established crops, so root systems are better able to absorb the nutrients before they are leached, and this can be applied at key growth times. 			Chooses either base dressing or side dressing and explains why that option is better, using some details.	Chooses either base dressing or side dressing and explains why that option is better, makes some links, including <u>underlined</u> -type evidence.	<p>Justifies whether base dressing or side dressing is the better option. Considers all factors: crop yield, environmental impact, and costs.</p> <p>Note: E7 / E8 candidates must consider plant processes and overall crop yield while comparing and contrasting fertiliser application.</p>

	<ul style="list-style-type: none"> There may be some damage to crops because of application methods. Side dressing may be more costly because a helicopter or a plane might be needed for some crops (e.g. squash) and may be applied more than once during the growth of the crop. 			
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N0 = No response; no relevant evidence.

Question THREE	Evidence	Achievement	Achievement with Merit	Achievement with Excellence
(a) (i)	<p><i>Training</i></p> <ul style="list-style-type: none"> • Training trees over canopies / pergolas or to a particular shape. <p><i>Pruning</i></p> <ul style="list-style-type: none"> • removing selected branches from a tree. 	<p>Describes how training and pruning are carried out.</p> <p>States correct equipment, e.g. pruning saw or lopping shears.</p>		
(ii)	<ul style="list-style-type: none"> • Training can give better light penetration to the entire canopy <u>so fruit ripen at an even rate and can be harvested at the same time.</u> • Pruning allows light into the canopy, <u>which will allow for more even ripening of fruit.</u> 	Explains how pruning and / or training improves fruit uniformity.	Explains how pruning and / or training improves fruit uniformity, makes links, <u>underlined-type</u> evidence.	
(b)	<ul style="list-style-type: none"> • Removing the terminal bud (aka thinning) will help produce more even-sized fruit. • Often, the fruit buds at the growing tip will receive more nutrients and grow much bigger than others in the cluster. • <u>Removing this means the nutrients are spread more equally to the rest of the fruit.</u> 	Explains why growers spend money and time removing terminal buds from fruit clusters.	Explains why growers spend money and time removing terminal buds from fruit clusters, makes some links, including <u>underlined-type</u> evidence.	
(c)	<ul style="list-style-type: none"> • If plants are too close to each other, there is competition for light, water nutrients, and smaller fruit, but more fruit per hectare. Etiolation of plants causes difficulty in harvesting, as well as machinery size etc. • If plants are spaced too far apart, there are larger fruit / plants, but less fruit per hectare, <u>and unutilised cropping space. Plants might not provide enough support for each other. There can be problems with pollination.</u> • Orientation. North-south orientation (where possible) maximises light to the crop and distributes light more evenly over the plant than east-west. <u>Even light distribution impacts plant growth / canopy / leaf cover and photosynthesis.</u> • Orientation is sometimes limited by topography and other land features (could discuss erosion control on hill sides or prevailing winds etc.) must be considered. 	<p>Explains why plant spacing and row orientation is important in crop growing.</p> <p>Not all factors considered.</p>	Explains why plant spacing and row orientation is important in crop growing, making links, <u>underlined-type</u> evidence.	Explains why plant spacing and row orientation is important in crop growing. Considers all factors: plant growing conditions, crop yield, and overall production.

N1	N2	A3	A4	M5	M6	E7	E8
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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