

90919



Draw a cross through the box (☒) if you have NOT written in this booklet



Mana Tohu Mātauranga o Aotearoa New Zealand Qualifications Authority

Level 1 Agricultural and Horticultural Science 2023

90919 Demonstrate knowledge of soil management practices

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate knowledge of soil management practices.	Demonstrate in-depth knowledge of soil management practices.	Demonstrate comprehensive knowledge of soil management practices.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–11 in the correct order and that none of these pages is blank.

Do not write in any cross-hatched area (only write in a will be cut off when the booklet is marked.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

QUESTION ONE: Irrigation

Irrigation is used in many agricultural and horticultural production systems, such as dairy farms and apple orchards. Due to the requirements of different production systems, a range of irrigation systems are used.			
Image	source	s: (pivot irrigator) https://thinkwatercanterbury.co.nz/news/which-irrigation-system-is-best-suited-to-your-farm (lawn irrigator) https://www.engledow.com/wp-content/uploads/2017/06/Irrigation.jpg	
Nam	ie a Ne	ew Zealand agricultural OR horticultural production system.	
Pro	oductio	on system:	
(a)	How	is irrigation carried out on your named production system?	
(b)	(i)	Explain the benefits of irrigation on biological and/or chemical properties of soil.	

	(ii)	How does irrigation improve plant growing conditions?
Nan	ne an a	alternative irrigation system that could be used on your chosen production system.
Alt	ternati	ve irrigation system:
(c)		pare this irrigation system with the method discussed on page 2. Justify the irrigation em that would best suit your chosen production system. In your answer consider: physical, chemical, and/or biological properties of soil crop yield efficiency of the irrigation system.

QUESTION TWO: Soils and nutrients

Soil testing is often carried out before applying fertiliser.

(a)	(i)	How are soil tests carried out?
	(ii)	How could a farmer use the information from a soil test to increase pasture growth?
(b)	With	reference to their physical properties, explain why nutrients are applied differently to a dy soil compared to a clay soil.

To improve plant growth, a dairy farmer can apply effluent or fertiliser.

,	chemical and biological properties of soil overall pasture growth.

QUESTION THREE: Crop rotation

Crop rotation can be used by growers to improve soil quality and increase yield.

How is crop r					
Explain why a	a grower might	include legume	s, like white clov	ver or lupin, whe	en rotating crops
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(c)	In the table below, describe how crop rotation changes properties of soil and explain how those
	changes impact plant growth.

Soil properties	Soil property changes	Impact on plant growth
Chemical		
Biological		
Physical		

A grower with clay-based soil wants to improve the soil's properties. They can either install sub-surface drains or add lime.

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•	plant growing conditions.

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