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SUPERVISOR'S USE ONLY

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

Level 2 Agricultural and Horticultural Science, 2012

91290 Demonstrate understanding of techniques used to modify physical factors of the environment for NZ plant production

2.00 pm Monday 26 November 2012
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of techniques used to modify physical factors of the environment for commercial plant production in New Zealand.	Demonstrate in-depth understanding of techniques used to modify physical factors of the environment for commercial plant production in New Zealand.	Demonstrate comprehensive understanding of techniques used to modify physical factors of the environment for commercial plant production in New Zealand.

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 2–8 in the correct order and that none of these pages is blank.

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

TOTAL

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You are advised to spend 60 minutes answering the questions in this booklet.

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QUESTION ONE: IRRIGATED PASTURE

Pasture is the main feed for livestock in New Zealand. To maintain a high level of pasture quantity and quality in drier regions, irrigation is required, an example of which is shown in the photograph below.

Centre pivot irrigation

(a) Explain in detail how irrigation improves pasture production.
In your answer, consider:

- how irrigation is used to modify the levels of plant-available water
- how these water levels impact on other factors that influence pasture production.

A dairy farm with a large herd size of 1,000 cows has two irrigation options available – centre pivot irrigation and travelling gun irrigation.

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(b) Justify the farmer's decision to use centre pivot irrigation, as shown in the photograph on page 2, rather than travelling gun irrigation.

In your answer, include an evaluation that compares the two irrigation systems in terms of:

- ease of management
- environmental impacts of their use
- economic considerations.

QUESTION TWO: GLASSHOUSE PRODUCTION

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High-value crops are often grown in a protected environment such as a glasshouse, as shown in the photograph below.

Outdoor production of cabbages and glasshouse production of tomatoes

A glasshouse allows the grower to monitor and control physical factors of the environment. Three of these physical factors are **temperature**, **light**, and **humidity**.

Select TWO of these physical factors.

(a) Explain, in detail, how a glasshouse is used to modify the physical factors you have selected, and how each modification improves crop production.

Physical factor (1): _____

Physical factor (2): _____

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(b) Justify the use of a glasshouse for the production of a high-value crop such as eggplants or capsicums, rather than outdoor production.

In your answer, consider:

- differences in crop quality between indoor and outdoor production
- the seasonal economic advantages of growing crops in a glasshouse
- labour requirements.

QUESTION THREE: OUTDOOR PRODUCTION

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Summer pruning and reflective mulches are two techniques that can be used when growing orchard fruit crops such as kiwifruit or apples.

Reflective mulch

Select ONE of these techniques: summer pruning *OR* reflective mulches.

Selected technique: _____

(a) Explain, in detail, how the use of your selected technique helps in the production of high-quality fruit.

A grower producing fruit for the **local** market decides to use summer pruning instead of laying reflective mulch under the fruit trees.

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(b) Justify the grower's decision to use summer pruning rather than reflective mulch on the basis of the economic and environmental advantages resulting from the use of summer pruning.

In your answer, include:

- a comparison of crop yield and crop quality when using each technique
- reasons why summer pruning is best when producing fruit for sale on the local market
- the environmental advantages of using summer pruning rather than reflective mulch.

Extra space if required.
Write the question number(s) if applicable.

QUESTION NUMBER

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