

No part of the candidate's evidence in this exemplar material may be presented in an external assessment for the purpose of gaining an NZQA qualification or award.

SUPERVISOR'S USE ONLY

3

91532



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

+



Mana Tohu Mātauranga o Aotearoa  
New Zealand Qualifications Authority

## Level 3 Agricultural and Horticultural Science 2025

### 91532 Analyse a New Zealand primary production environmental issue

Credits: Five

| Achievement   | Achievement with Merit   | Achievement with Excellence   |
|---|--|---|
| Analyse a New Zealand primary production environmental issue. | Critically analyse a New Zealand primary production environmental issue. | Comprehensively analyse a New Zealand primary production environmental issue. |

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 2–10 in the correct order and that none of these pages is blank.

Do not write in the margins (//////). This area will be cut off when the booklet is marked.

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

**Achievement**

**TOTAL 4**

**INSTRUCTIONS**

Carefully read ALL the instructions AND parts of the task before answering.

Answer the different parts using one primary production system.

Name your specific primary production system.

Primary production system: Dairy farming

**PLANNING**

Rural News: riparian planting + fencing off waterways decreased sediment by 80%, Nitrogen by 60% and phosphorus by 50%.

Dairy NZ: since 2022-23 the % of cows have increased by 0.6%.

Dairy NZ: The ideal number of cows per hectare is 2.8 to reduce the possibility of overstocking.

**TASK: The impact of management practices on biodiversity**

Primary producers carry out management practices to produce their products. Some of these management practices have negative impacts on the biodiversity of the environment.

- (a) For your chosen primary production system, explain the **negative** impact its production can have on biodiversity. In your answer consider the management practices used, and how biodiversity is impacted.

Use data from within the past five years and other evidence to support your answer.

Dairy farming can negatively impact biodiversity due to an excessive use of harmful fertilisers. When fertiliser is added at the wrong time of the year or just before or after rain, it can increase the amount of runoff into waterways. This is a negative impact because the nitrogen and phosphorus in ~~the~~ fertiliser increases the growth rate of algae creating algae blooms which cover the surface of the waterway, blocking sunlight to the plants in the water. This stops photosynthesis from happening, killing the plants and the fish along with it due to the fish not having food, decreasing the amount of biodiversity. Also with the algae blooms it increases the amount of bacteria due to a bigger food supply, depleting the oxygen levels, allowing the fish to suffocate. Toxic algae can also grow which also kills the fish and anything that eats it. This decreases the quality and biodiversity in the water.

Many farmers understand that their production can have a negative impact on biodiversity and are using courses of action to mitigate the negative impacts or improve biodiversity.

- (b) Explain how TWO courses of action, when used correctly, will **mitigate** the negative impacts or **improve** biodiversity for your chosen production system.

Use recent data from within the past five years and other evidence to support your answer.

Course of action (1): Riparian planting

By using Riparian planting around the waterways it can improve biodiversity by acting like a filter when runoff happens. According to Rural News riparian planting and fencing off waterways it decreases sediment by 80%, nitrogen by 60% and phosphorus by 50%. This decreases the amount of algae blooms <sup>which</sup> help ~~ing~~ keep the biodiversity in waterways. riparian planting also introduces habitat for native birds, pollinators, insects, and so on. Due to the fact that riparian planting is mostly done with native plants, it creates an incoroging environment for all ~~sp~~ native species increasing biodiversity.

Course of action (2): reducing the use of harmful fertiliser

When a dairy farmer buys fertiliser for their farm, normally ~~to~~ half of it ends up in the waterway, so by reducing the amount of fertilisers used it is helping with the biodiversity of the waterways along with being economically sustainable as the farmer isn't spending as much money of fertiliser for it to end up in the waterways and not being useful to the farm. By testing the soil regularly it allows the farmer to know how much fertiliser of **NPK** (nitrogen, phosphorus, potassium) is needed. For example, if the farm has more phosphorus than needed and less nitrogen then the farmer knows to get a nitrogen based fertiliser. This decreases the fertiliser cost and increases the biodiversity ~~to~~ by having less runoff and allowing pollinators to help pollinate the grass with the possibility of having a fertiliser free farm in the future.



Source: <https://www.eeec.org.au/wp-content/uploads/2023/05/enviro-1024x1024.jpg>

- (c) Justify which of your two courses of action has the greatest positive impact on biodiversity, while ensuring the environmental, economic, and social sustainability of your production system.

Use recent data from within the past five years and other evidence to support your answer.

Action 1 has the greatest positive impact on biodiversity, while ensuring the environmental, economic, and social sustainability because by using riparian planting it introduces native plants and a habitat for new or more habitat for old species helping with the

environmental side, it acts as a filter to ~~to~~ decrease sediment by 80%, nitrogen by 60%, and phosphorus by 50%. (rural news ~~news~~) ~~to~~ allowing farmers to not spend as much money on water testing as frequent, helping with both environmental and economic, and with the water ways clearer it creates a social space for families and friends to ~~be~~ be and creating a place for swimming. Although I personally think that both Action 1 and 2 could work exceptionally well together, decreasing cost in fertiliser and water testing, keeping the water's quality even higher and creating even safer water to swim in, if the farmer can only choose one action, I would say riparian planting increases biodiversity in an environmental economic and social aspect the most.

## Achievement

**Subject:** Agricultural and Horticultural Science

**Standard:** 91532

**Total score:** 4

| Q   | Grade score | Marker commentary  |
|-----|-------------|--|
| One | A4          | The candidate has explained the impact dairy farming can have on biodiversity. They have explained how fertiliser runoff can cause algal blooms, and how this can lead to less biodiversity in the water. They have explained how riparian zones reduce the impact of nutrients on the waterways. They have also explained how soil testing can result in the farmer applying less fertilizer, therefore lessening the chance of eutrophication. For merit, the candidate could have explained in detail how algal blooms cause less oxygen in the water and given details on how riparian zones reduce the amount of eutrophication occurring in the water. |