Pilot Assessment Schedule – 2023

Agricultural and Horticultural Science: Demonstrate understanding of sustainability considerations that influence primary production practices (91931)

Assessment Criteria

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of sustainability considerations that influence primary production management practices.	Explain sustainability considerations that influence primary production management practices.	Evaluate sustainability considerations that influence primary production management practices.

Report topic: Water sustainability

Sample evidence	Achievement	Achievement with Merit	Achievement with Excellence
The following descriptions should be referenced in the candidate's chosen primary production system. *Sustainability* Environmental sustainability – is the ability to maintain an ecological balance in our natural systems while allowing long-term production. Economic sustainability – is the ability to maintain long-term profitable production. Social sustainability – is the ability to support the social needs of communities both now and in the future. *Impacts* Water • Nutrients can leach and runoff into aquifers or waterways. Nitrogen and phosphate are often limiting factors in waterways. An increase in these nutrients results in algal growth which can lead to eutrophication and the death of aquatic life due to low oxygen levels and the decomposition of the algal biomass. • Stock accessing waterways can erode stream beds and banks. When livestock access streams they can break down the edges of streams allowing soil and nutrients into the water, leading to algal growth. Plants that shelter the edges of streams are eaten or washed away and no longer filter the runoff and shade streams. This results in high temperatures and lower oxygen levels.	Describes water sustainability considerations of chosen management practices. Describes management practices that influence water sustainability considerations by addressing environmental implications.	Explains impacts that pastoral farming has on environment **and** explains how management practices impact on water sustainability.	Evaluates the choice of a management practice in terms of water sustainability and other sustainability considerations: • social • economic.

Primary production system: Dairy **Management practices** *Riparian planting* – Planting the riparian margins with native species to reduce surface runoff. Runoff from pasture can carry nutrients and pathogens from stock waste into the water. Having a planted margin filters these contaminants before getting to the waterways. This prevents excessive algal growth. Planted stream banks also reduce the temperature of the water, leading to a better habitat for aquatic life and improving fishing and recreational opportunities. **By planting out the stream banks you are demonstrating manaakitanga by providing habitats for native pollinators and predatory insects, which in turn pollinate and act as biocontrol agents.** *Reducing stocking rates* – Reducing the stock numbers per hectare to reduce the inputs (feed) and outputs (waste). Less stock means less effluent is produced. Feed requirements are less and therefore farmers will not need to rely on supplementary feed when grass growth is limited. Reduced stocking rates can result in less income for the farmer but at the same time it reduces costs. Lower stock numbers may reduce a farmer's workload, which in turn can allow them to contribute more to local communities. **Reducing stock rates demonstrates tiakitanga by reducing the stress on the land and resources, protecting it for future generations.** *Justifies management practice* – Reducing stock rates will have the best opportunity at ensuring sustainability of a pastoral production system in both the short- and long-term. Reducing the stocking rates allows the farmer to use fewer inputs such as feed, fuel, and fertilisers, reducing both the environmental impact and the economic costs. With fewer inputs, there will be fewer outputs of effluent and product. This reduces the environmental impact of the farm. While reduced product means less income for the farmer, this can be outweighed by fewer expenses. With lower stock numbers, the farmer may be able to retire marginal land, protect the headwaters of waterways, and create a carbon sink for greenhouse gases produced on the farm. Socially the farmer will have more time to be involved in the local community and better-quality waterways will provide greater recreational opportunities for swimming and fishing.			

N1	N2	A3	A4	M5	M6	E7	E8
Shows no understanding of sustainability considerations or any relevant Māori value.	Shows minimal understanding of sustainability considerations or any relevant Māori value.	Shows some understanding of water sustainability considerations of a chosen management practice and a relevant Māori value.	Demonstrates complete understanding of sustainability considerations of a chosen management practice and a relevant Māori value.	Explains in some detail the choice of a management practice based on water sustainability considerations and environmental implications with a relevant Māori value.	Comprehensively explains the choice of a management practice based on water sustainability considerations and environmental implications with a relevant Māori value.	Evaluates some aspects of management practices based on environmental, social or economic sustainability implications. Gives some reasons along with a relevant Māori value.	Evaluates management practices based on environmental, social and economic sustainability implications. Gives comprehensive reasons and relates this to a relevant Māori value.

N0 = No response; no relevant evidence.

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 2	3 – 4	5 – 6	7 – 8

Appendix: Marker determination of validity of evidence

Professional judgement

The marker will determine a grade using their professional judgement based on a holistic examination of the evidence provided.

Demonstration of understanding

A response must use information to **demonstrate understanding**. The marker must exercise professional judgement to decide if it does so. The following guidance is provided to assist in making this professional judgement.

- A response **demonstrates understanding** if it can be described wholly or substantially by one or more of the statements in the **left-hand column**.
- A response **does not demonstrate understanding** if it can be described wholly or substantially by one or more of the statements in the **right-hand column**.
- If a response is comprised of both used and reproduced information, the marker must decide if it meets the standard **when the reproduced information is ignored**.

Evidence of <u>use</u> of information	Evidence of <u>reproduction</u> of information
Prompts and / or questions have been provided and the candidate has responded to these. The response uses information relating to the standard, the prompts, or questions.	Information is presented that does not relate to the prompts.
Information from the candidate's practice, performance, research, the practice of others, and or teaching, is related to the candidate's experiences.	Information is presented in isolation from the candidate's experiences.
The response shows understanding that could be expected to come from a course of instruction derived from Level 6 of *The New Zealand Curriculum*.	Little or nothing is offered to suggest the information is related to a course of instruction at Level 6 of *The New Zealand Curriculum*.
Information is presented in the candidate's own voice.	Information is not in the candidate's voice. The word choice, sentence structure, sentence length, punctuation etc, are not what a candidate could be expected to produce.
Referenced complex research information unchanged by paraphrase is related to other information in a manner that constructs meaning.	**Unreferenced** complex information is presented as though it is the candidate's own work.

In general, the marker will exercise the following judgement:

N1	N2
The response does not include enough evidence to show understanding, and / or is substantially reproduced with little mediation by the candidate.	The response is substantially produced by the candidate, but demonstrates little understanding. One part of the required response may be completely missing, or several parts may be weak.

Where doubt exists as to whether evidence has been produced, mediated, or used by the candidate, the doubt must be exercised to the benefit of the candidate.