

Assessment Schedule – 2023

Agricultural and Horticultural Science: Analyse a New Zealand primary production environmental issue (91532)

Assessment Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<p><i>Analyse</i> involves:</p> <ul style="list-style-type: none"> explaining the environmental issue arising from the primary production management practices explaining potential courses of action to mitigate the negative impacts of the management practices recommending course(s) of action to support sustainable management practices. 	<p><i>Critically analyse</i> involves:</p> <ul style="list-style-type: none"> explaining, in detail, the environmental issue arising from primary production management practices evaluating potential courses of action to mitigate the negative impacts of the production management practices; this may include comparing and contrasting alternative courses of action. Recommending course(s) of action to support sustainable production management practices that best address the issue. 	<p><i>Comprehensively analyse</i> involves:</p> <ul style="list-style-type: none"> justifying course(s) of action to support sustainable production management practice(s) that best address the issue; this includes environmental, economic, political, and / or social considerations.

N1	N2	A3	A4	M5	M6	E7	E8
<p>Partially explains the emission of greenhouse gases in the production of their chosen primary product.</p>	<p>Partially explains the emission of greenhouse gases AND the political impact of producing their chosen primary product.</p>	<p>Explains the emission of greenhouse gases AND partially explains the political impact of producing their chosen primary product.</p> <p>AND</p> <p>Explains a realistic course of action that could be taken to allow for sustainable production. (Mainly the reduction of greenhouse gases.)</p>	<p>Explains the emission of greenhouse gases AND explains the political impact of producing their chosen primary product.</p> <p>AND</p> <p>Explains a realistic course of action that could be taken to allow for sustainable production. (Mainly the reduction of greenhouse gases.)</p>	<p>Explains in detail the emission of greenhouse gases AND explains the political impact of producing their chosen primary product.</p> <p>AND</p> <p>Explains in detail a realistic course of action that could be taken to allow for sustainable production. (The reduction of greenhouse gases, with some coverage of social, economic, or political impacts of the course of action.)</p>	<p>Explains in detail the emission of greenhouse gases AND explains in detail the political impact of producing their chosen primary product.</p> <p>AND</p> <p>Explains in detail a realistic course of action that could be taken to allow for sustainable production. (The reduction of greenhouse gases, with some coverage of social, economic, or political impacts of the course of action.)</p>	<p>Explains in detail the emission of greenhouse gases AND explains in detail the political impact of producing their chosen primary product.</p> <p>AND</p> <p>Justifies a realistic course of action that could be taken to allow for sustainable production over another course of action. (Detail on the reduction of greenhouse gases, as well as discussion on social and / or economic and / or political sustainability aspects of the course of action.)</p>	<p>Explains in detail the emission of greenhouse gases AND explains in detail the political impact of producing their chosen primary product.</p> <p>AND</p> <p>Comprehensively justifies a realistic course of action that could be taken to allow for sustainable production over another course of action. (Detail on the reduction of greenhouse gases, as well as discussion on social, political, and economic sustainability aspects of the course of action.)</p>

N0 = No response; no relevant evidence.

Evidence

Task	Sample evidence	Achievement	Achievement with Merit	Achievement with Excellence
(a)	<p><i>Greenhouse gases (example)</i></p> <p>Methane:</p> <ul style="list-style-type: none"> • released from ruminant digestion • released from stored manure. <p>Nitrous oxide:</p> <ul style="list-style-type: none"> • released from cultivated paddocks, or • from the addition of nitrogenous fertiliser, or • from animal urine. <p>Carbon dioxide:</p> <ul style="list-style-type: none"> • Clearing and burning of scrub / bush to allow for pasture production. 	<p>Explains in general terms how greenhouse gases are emitted in the production of a chosen primary product.</p>	<p>Explains in detail how greenhouse gases are emitted in the production of a chosen primary product.</p>	
(b)	<p><i>Political impacts (example)</i></p> <ul style="list-style-type: none"> • Paris agreement signed by the New Zealand Government to get our GHG emissions 30% below 2005 levels by 2030. • Emissions trading scheme introduced to put a cost on GHG emissions. • Agricultural GHG emissions pricing scheme introduced by the government in 2022, making New Zealand the first country to tax agricultural GHG emissions. • All funds raised from any GHG tax will be funnelled into research to assist farmers to reduce their GHG emissions. • Dairy NZ is educating farmers, so they understand the greenhouse gases that are produced on farm. • The Pastoral Greenhouse Gas Research Consortium is researching ways to mitigate greenhouse gases produced through the agricultural sector. 	<p>Explains in general terms the steps the New Zealand government and industry are taking to reduce the greenhouse gases emitted from production of a chosen primary product.</p>	<p>Explains in detail the steps the New Zealand government and industry are taking to reduce the greenhouse gases emitted from production of a chosen primary product.</p>	

(c)(i)	<p><i>Courses of action (example)</i></p> <ul style="list-style-type: none"> • Low methane-emitting livestock can be bred or purchased. • Reduce reliance on nitrogen fertiliser. • Use crops or feeds that require less nitrogenous fertiliser. • Ensure livestock are fed on crops or feed that release less methane during digestion. • When the technology is available, use of methane inhibitors. 	Explains specific courses of action that can be taken to reduce emissions of greenhouse gases in the production of a chosen primary product.	Explains specific courses of action that can be taken to reduce emissions of greenhouse gases in the production of a chosen primary product.	
(ii)	<ul style="list-style-type: none"> • Greater milk solid production per cow means fewer cows are required to produce the same overall volume of milk, meaning less GHG production. • Improve animal efficiency through better genetics. • Methane and nitrous oxide emissions are strongly related to the quantity of feed eaten. • Less feed consumed over the life of the animal, as the animal grows to slaughter weight quicker, means less belching of methane from the ruminant animals. Less nitrogen is consumed, as the animal consumes less feed over its lifetime, so less is returned to the soil by urine or dung to be converted by microbes into nitrous oxide. • If stock numbers are held constant, then less feed is consumed on farm for the same quantity of production. This would be a current goal of producers to improve animal efficiency, with the additional benefit of reducing GHG emissions. • As less feed is consumed on farm, less productive areas of the farm can be planted to create carbon sinks. • Economic and social outcomes for the farmer, local community, and the country's exports remain high, as farmers are still able to keep producing. This means jobs on farm and in local businesses are not disrupted. • Income from animal production is maintained due to the farmer maintaining production on farm to meet emissions reduction, resulting in current levels of profitability. 	Justifies the course of action that has the most significant impact in reducing greenhouse gas emissions, allowing for sustainable production of a chosen primary product.	Justifies the course of action that has the most significant impact in reducing greenhouse gas emissions, allowing for sustainable production of a chosen primary product. Considers some impacts and uses up-to-date data.	Justifies the course of action that has the most significant impact in reducing greenhouse gas emissions, allowing for sustainable production of a chosen primary product. Considers all impacts and uses up-to-date data.

Cut Scores

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