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NEW ZEALAND QUALIFICATIONS AUTHORITY
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Level 3 Agricultural and Horticultural Science, 2016

91532 Analyse a New Zealand primary production environmental issue

9.30 a.m. Monday 14 November 2016
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 BOTH parts of the task 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.

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

Merit

TOTAL

M5

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INSTRUCTIONS

This paper consists of ONE task, in TWO parts (A and B), which requires you to discuss the impact on biodiversity of a selected agricultural or horticultural production system. This will include the management practices of a producer to mitigate any negative impacts.

Name of your selected production system: _____

Dairy Farming

A New Zealand example of declining biodiversity.

PART A

Explain how agricultural OR horticultural production management practices have impacted on the biodiversity of the local environment in New Zealand.

In your answer:

- discuss the **economic** factors that may have contributed to these practices, and the **negative social impacts** of declining biodiversity resulting from your selected agricultural or horticultural production system
- give **specific examples** of the decline in local biodiversity due to intensification of your selected agricultural or horticultural production system.

80% of plants in NZ are endemic
1.8 million pastoral land used for dairy farming out of a total of 12 mil (2015)
Agriculture Intensification

~~Horticultural~~ Agricultural production management practices have had a negative impact on the biodiversity of the local environment in New Zealand. An example of these ~~horticultural~~ ^{Agri} agricultural production management practices is dairy farming intensification. Why a dairy farm may use this economically is to increase profit, you are getting more money for dairy farming by increasing the amount cows you have to milk, as a dairy farm with 500 cows has a better trade off than a farm with 100 cows. Another economic factor that may have contributed is the cost, the intensification of a dairy farm needs equipment, and storage and space, and you economically benefit over the long term of earning revenue for what you pay is if you have a widescale dairy farm. However, there are negative social impacts of declining biodiversity that can result from this includes a loss of use of local rivers, streams and lakes. People enjoy going swimming, and if they can no longer do that due to

More space for this answer is available on the next page.

nutrients and dirt going into it, and making it unsafe for people, then that is not going to make people happy. They also like to fish, so if there is no fish in these bodies of water due to eutrophication, then that is also not going to make people happy. ~~The~~ The loss of biodiversity negatively impacts essentially recreational activities that people engage in and enjoy. And because of intensification, this results in that loss of biodiversity loss is not mitigated. 80% of New Zealand's plants are endemic, meaning only found in New Zealand, so if agrichemicals, another agricultural management practice used, cause ~~plants~~ certain local plants to be killed, this has a serious impact on local biodiversity. An ~~ex~~ specific example of the decline in local biodiversity due to intensification of dairy farms is the ^{reversal of} ~~decline of~~ dairy in 2003, which caused the Water Accord to be formed on the same year, due to damage to local streams, rivers and lakes as affected by the intensification.

PART B

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Justify a course of action that could be carried out by a producer to potentially mitigate the negative impacts of the management practices on the biodiversity of the local environment for your selected agricultural or horticultural production system.

In your answer:

- evaluate at least TWO courses of action
- include social and economic considerations.

A course of action that could be carried out by a ~~pro~~ producer to potentially mitigate the negative impacts of the management practices on the biodiversity of the ~~local~~ local environment for dairy farming is riparian planting. Riparian planting is where you fence off nearby pastoral land to any streams, rivers or lakes so cows ~~can~~ can not access them, and then subsequently planting native plants and trees next to it. This is one: to ~~allow~~ not allow cows to dirty water with themselves and their excrement and two: so any run off nutrients and ~~at~~ fertiliser from the farms are absorbed by the trees and plants instead of going into the water, which causes eutrophication and subsequent loss of life in the water due to the oxygen being stripped away. Socially, this can be considered positive, as they can be safely ~~recreational~~ used for any recreational activities, as well as the local population can ~~be~~ be happy as it encourages native life, as planting native trees as shelterbelts increases spider and ~~small~~ beetle population by 13%. However, economically, there are aspects to be considered. The cost of the fences is a large aspect, as it costs minimally \$3, and ~~you~~ increases the more fencing you need to use for your dairy farms.

As well as that, you will be losing any ~~to~~ pastoral land you do fence off for grazing, as dairy farms use "1.8 million pastoral land out of a total 12 million" (2015), so there is that cost as well. However, in the long term, it is economically more beneficial for a producer to carry out ~~a course~~ a course of action such as riparian planting to potentially mitigate local biodiversity loss.

Another course of action that could be carried out by a producer to potentially mitigate the negative impacts of the management practices on the biodiversity of the local environment for dairy farming is effluent holding tanks. Effluent holding tanks are containers to hold cow excrement for periods of time until they can be safely dumped elsewhere, such as effluent ponds. This is to make sure the effluent does not damage any local plant life or bodies of water, as cows produce a large amount of effluent in a single day. If not contained, any rivers or streams could potentially be dirtied by it, and can kill ~~native~~ local plant life. Socially, there could be positive ~~and~~ negative, as people could complain about the concentrated smell coming from the effluent, as well as any potential

health concerns. However, positively, it would allow dairy farms to prevent local rivers, streams and lakes from being dirtied, therefore keeping them safe for recreational activities people use them for. Economically, it could be expensive as you need labour to pick up all the cow effluent, and then containers to store them in that are in large amounts and are big, as well any transportation costs for dumping the effluent holding tanks. However, it could be economically beneficial as it would potentially mitigate any potential biodiversity loss, as proven by South Coast Dairy Ltd in Southland as they use both courses of actions mentioned above and are still in business.

Merit exemplar for 91532 – 2016		Grade Score: M5
Question part	Annotation	
A + B	<p>The candidate explained positive and negative environmental, social, and economic impacts that production systems contribute to in relation to biodiversity. The candidate evaluated the mitigation of negative effects with at least one course of action. There was no course of action justified over another, but the answer was well written and easy to understand.</p>	