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NEW ZEALAND QUALIFICATIONS AUTHORITY
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Level 2 Agricultural and Horticultural Science, 2016

91297 Demonstrate understanding of land use for primary production in New Zealand

2.00 p.m. Monday 14 November 2016
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of land use for primary production in New Zealand.	Demonstrate in-depth understanding of land use for primary production in New Zealand.	Demonstrate comprehensive understanding of land use for primary 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.

Excellence

TOTAL

23

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QUESTION ONE: HORTICULTURAL PRODUCTION

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Horticultural land use changes to reflect variations in consumer demand. Some of the changes in land use between 1994 and 2014 are shown in the table below.

	Hectares under cultivation in New Zealand at 30 June		
Product	1994	2005	2014
Apples	15257	10982	8417
Kiwifruit	12 174	12 071	12 081
Wine grapes	7 160	24 793	33 761

Source (extract): Statistics New Zealand

Refer to the table and land use factors such as economic, environmental, technological, social, political, and workforce considerations to answer (a) and (b).

- (a) In 2014, New Zealand produced its highest ever yield per hectare of apples, despite the area of land in apple production being the smallest in 20 years.

Explain in detail TWO factors that may have led to this change in land use.

The apple yield per hectare increasing hugely could be put down to technological advances in apple harvesting and processing but most likely just advances in spraying systems and crop protection methods for example previous to these high yields apples may have been damaged from hail and severe weather. Now however structures with thin mesh nets can be rolled out over orchards making apples safe from hail which has meant less damaged and more fresh apples to sell. The economic factor may also have driven this strong rise in production per hectare as orchards are being made smaller or sold off there becomes a stronger demand to produce apples off a smaller land area. This could be fuelled by other produce like grapes may now be the other half of the orchard as it may be slightly more profitable but the farmer may want to remain diverse therefore he will ~~ing~~ boost production over a smaller land area.

(b) Justify traditional, current, and likely future horticultural land use in New Zealand.

In your answer, refer to the table and the land use factors on page 2, to:

- explain changes in land use between 1994 and 2014
- explain, in detail, what this might mean for current land use
- predict how this information might affect future land use.

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The apple industry has reduced the amount of land being used to grow apples from 15,257 → 8,417 hectares over the past 20 years. This change may be due to increased demand of other produce like wine which may have meant apple orchards being converted to vineyards. Kiwifruit production however has remained reasonably constant hovering around 12,100 hectares. This can be put down to the constant demand for NZ kiwifruit as it is named after this country our demand will stay strong. The huge increase in the wine or vineyard area from 7,160 → 33,761 is largely due to NZ's extremely favourable climatic conditions for growing grapes which had gone unrealised. The very hot and dry summers suite grapes perfectly as cold winters keep grapes dormant. Our low humidity and long sunshine hours are perfect to grow grapes in the minimal rain over summer means that grapes are dry which makes a very desirable wine. The demand for this NZ wine has increased hugely worldwide. Future land use may be increasing numbers of vineyards as demand remains strong for NZ wine however, there is only so much land available to plant in vineyard as their climatic needs are so specific. So there may be an increase in vineyards in Marlborough, Hawkes Bay, Central Otago, Nelson and North Canterbury which already hold a lot of vineyards.

QUESTION TWO: LAND USE CONFLICTS

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Horticulture New Zealand is calling for protection of land classified as highly productive: "Only 5% of New Zealand soils fall into this category," it says, but 1.8% of this has been lost to less productive uses in the last 10 years. "If councils had any regard for the special characteristics of high production land they would then look at the effects of siting new housing developments there."

Source (adapted): NZ Grower, 2015, Vol 70, No 6, p.13.

Councils need to consider the economic, environmental, and social effects when siting new housing developments on highly productive land.

Discuss the implications for land use if councils do not consider these effects.

In your answer, using TWO land use factors:

- explain why there is a conflict between horticultural land use and residential use
- explain, in detail, how traditional land use has influenced the tension seen in current land use
- compare and contrast the implications if a council does not consider highly productive land when changing horticultural land use to residential land use.

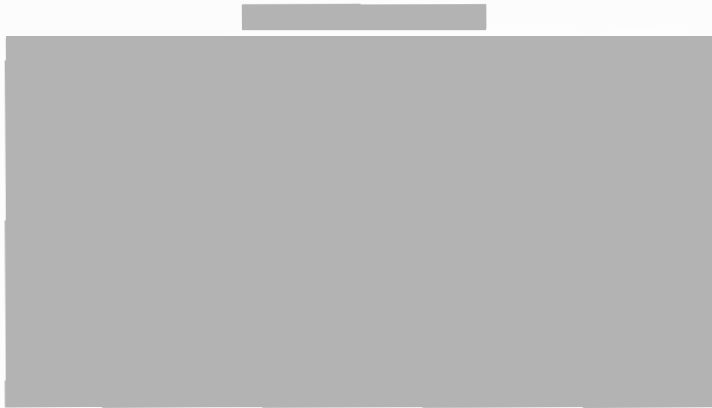
There is a strong conflict between horticulture use and residential use because cities are often built in low lying areas near the sea. This happens to be where the best quality soils are for example Christchurch is built on very nutrient rich soils. The Horticulture industry wants these sorts of towns and cities to stop expanding further over these quality soils but instead onto stoney more unproductive soils. Having a housing block over a potential market garden will mean a huge loss in the countries output of potential exports. It will also mean the the potential jobs ~~being~~ lost from workers at the market garden will increase unemployment rates as well. However workers that want to live on this land will be happy as their commute to work may be faster. The traditional land use of market gardening ~~usually~~ provided communitys and often whole cities with fruit and vege which inturn they earned a profit from. If the current residential land use ~~continues~~ continues to use up this valuable land not only will jobs be lost by workers but fruit and vege will become more expensive for the consumer as there ~~is~~ will be more

imported. As this land becomes residential land more housing will be provided and selling. For the economy it could decrease housing prices. However this is a negative compared to the huge loss of production in fruit and veg. As now the economy will be importing more. Or just not exporting as much. Workers who previously worked on the land will now be unemployed which is bad for the economy as the govt may demand higher taxes. ~~the~~

QUESTION THREE: EL NIÑO

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New Zealand is often affected by the El Niño weather pattern, which can lead to drought. El Niño is a set of warm conditions in the central Pacific that bring dry weather to the east of New Zealand and rain to the west, affecting agricultural and horticultural production. The NZ Institute of Economic Research (NZIER) said: The 2015–2016 summer El Niño would not be enough to tip the country into a recession, as was the case in the past El Niño in the 1997–1998 summer. Source (adapted): *New Zealand Herald*, 22 September 2015; article by Jamie Gray.



Source: <http://www.stuff.co.nz/business/farming/sheep/67324546/sheep-and-beef-are-doing-it-tough-in-drought>

Justify, with reference to traditional and current land use, why NZIER made the above statement. Take into account land use factors such as economic, environmental, technological, social, political, and workforce considerations.

In your answer, explain in detail, using TWO land use factors:

- how traditional land use in 1997–1998 may have been affected by the El Niño weather pattern
- how current land use may not be as significantly affected by El Niño.

The traditional land use that was affected by El Niño was more sheep and beef based production for meat and wool with most being done over dryland. This was the most economically viable farming option for these conditions because without irrigation and other technologies other farming options weren't possible e.g. Dairy farming. The El Niño had an extreme effect back in 1997–1998 due to minimal access to irrigation this meant that ~~the~~ very undiversified farming (mostly sheep, beef and crop) were very vulnerable to drought. This had a huge effect on the economy facing a recession because the meat industries output was so largely reduced due to most farmers being hit with the drought that the whole economy

~~Buttered~~ The exporters, their labour. The farmers and
 their labour. The local businesses and their labour etc
 all as a result of the drought. As farmers faced such a
 huge reduction in profits, ~~the~~ nearly every sector of the
 economy also felt it. However the current land use has far
 diversified from what it was then which is due to
 technological advances in irrigation systems and to cropping
 systems like tractors. Irrigation has strongly influenced dairy
 farming which has now become a more attractive way to
 use the land as more profit can be made per hectare than
 the traditional sheep and beef did. It has also driven
 intensified cropping and horticulture. By using irrigation
 the effect of a drought now becomes minimal only affecting
 farmers without irrigation. This advancement in irrigation
 creates a full protection to drought for farmers nowadays
 so they will not be nearly as heavily affected by dry
 economy
 weather now as the NZTER stated.

Annotations

Excellence Exemplar 2016

Subject:		Agricultural and Horticultural Science		Standard:		91297		Total score:		23	
Q	Grade score		Annotation								
1	8		a) The candidate links economic returns to improved growing techniques, especially in the case of adverse weather conditions early in production. b) The candidate links the change in production levels to worldwide demand and gives examples of how producers have been able to achieve this.								
2	8		The candidate recognises that populations often develop close to the sea, which is also where the most fertile land is found and consequently utilised. Links are then made to the subsequent effect on personal, local, national, and export incomes.								
3	7		The candidate fully explains the effect on dry stock production during the 1997-1998 weather event, then links this to the economic downturn nationally. They compare this to the recent situation in 2015-2016 to explain why the changes in production, e.g. dry stock farmers converting to dairy and the development of more efficient technology, has had less of an effect on the national economy.								