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NZQA

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# Level 3 Agricultural and Horticultural Science, 2016

## 91531 Demonstrate understanding of how the production process meets market requirements for a New Zealand primary product(s)

9.30 a.m. Monday 14 November 2016
Credits: Four

| Achievement | Achievement with Merit | Achievement with Excellence |
|---|---|---|
| Demonstrate understanding of how the production process meets market requirements for a New Zealand primary product(s). | Demonstrate in-depth understanding of how the production process meets market requirements for a New Zealand primary product(s). | Demonstrate comprehensive understanding of how the production process meets market requirements for a New Zealand primary product(s). |

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 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 2–8 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 E8

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## INSTRUCTIONS

This paper consists of ONE task, in THREE parts.

**Before** you select your nationally significant primary product and its specific market, read the **entire task** carefully, to ensure that your selection will allow you to meet the requirements of the task.

Nationally significant primary product (in unprocessed form): Apples //

Specific market for this product: Asia //

Growers follow a sequence of production processes in order to produce a product that meets the requirements of different markets.

In the table below, list the key production processes that are carried out during the production cycle of your product. The production cycle includes the following three phases: establishment, growth, and harvesting of the product.

| Production processes |
| --- |
| e.g. Grafting new vines<br>e.g. Drenching for parasites |
| rootstock selection |
| reflective mulch |
| winter prune |
| |
| |
| |

## PART A

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For your product, describe the consistency or uniformity requirements that could influence the price received by a grower when supplying to the market, and explain why the market has these requirements.

When New Zealand growers are supplying apples to Asian markets, we try to send our fruit, when it is there off season, Asian markets such as ~~Korea~~ Taiwan pay higher prices for our apples when they don't have any of their own apples in their market place. Supplying to such Asian countries which are located in the northern hemisphere allows us to be counter seasonal, which means we can supply our apples when their domestic season is over. For every manganent practice we ~~can~~ use, is to get our apples to market earlier to gain higher prices because of less apples in the market. For example, ~~Korea~~ Chile can also supply these Asian markets with apples like we can and for a lower price due to cheap labour and cheap production costs. According to Shona White from Fernridge our price for our apples dropped $7 a carton when Chile arrived in the market. So if growers can get apples to market a 2 weeks earlier they will have higher prices for longer. By using managment practises as mentioned on page 2 we can have consistency and uniformality each year, due to more apples now been sold on contract to those markets, which allow established markets with high prices. With more apples been sold on contract compared to contingment, growers will recieve a more stable market. each apple that is sent to those markets must, to abide by contract, meet the requirements of 75%-100% colour and less than 1cm² of russet on each apple. This results in apples being exported and with a higher pack out percentage, resulting in more apples exported and ~~more~~ higher prices for growers. M

**This examination continues on the following page.**

## PART B

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In the table below, write THREE management practices that are carried out during the production of your product.

The selected management practices must be from at least TWO of the following different phases:

- Establishment of product
- Growth of product
- Harvesting of product

TWO examples have been provided to assist you.

| | Management practice | Phase of production |
|---|---|---|
| e.g. | Grafting new vines | Establishment |
| | Drenching for parasites | Growth |
| 1 | rootstock selection | establishment |
| 2 | winter prune | growth |
| 3 | reflective mulch. | growth. |

Explain how your selected management practices impact directly on the quality and/or quantity of your product at harvest.

Management practice (1)

root-stock selection effects quality and quantity of apples at harvest. rootstocks are the base of which the trees are grown on. Rasenly the growers having been taking out old trees which were on the M9/106 semi-dwarfing rootstock and replacing them with the M27 super-dwarfing rootstock. This results in a smaller apple tree, producing more exportable fruit. This is because it effects the quality of the products. With a smaller tree, there is less branches. This results in less rubbing together of the branches in heavy winds which causes a bruising called russet. To export to Asian markets each apple must consist of less then 1cm² of russett. So by having less branches and therefore less russet there is better quality of your apples, and because it has better quality it will have a higher pack-out percentage and therefore have more quantity. //

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Management practice (2)

// Winter pruning effects directly the ~~quantity~~ quality of apples. Winter pruning takes place in June, July and August and results in less branches/less bush, on the tree. Winter pruning is where the tree is thinned and removes 'complicated branches' says Mr Rowe from Turners and growers. By removing the side shoots off branches you are allowing for more light inseption into the tree when apples start appearing on the tree. By having greater light inseption in the plant, it allows the apples to have a higher colour, which ~~allows~~ apples exported into Asian markets have to have colour of 75-100% colour. This improves the quality of the apple and therefore results, as did rootstock selection, in a higher pack out percentage because of more apples meeting this 75-100% requirment, so therefore impacts on quantity of apples at harvest also. //

Management practice (3)

// Reflective mulch impacts directly on quality and quantity of apples to Asian markets. Reflective mulch is a large white plastic material which is placed between the apple trees in January and February. By putting down reflective mulch, the light which would normally not hit the underside of the apple, reflects off the white surface and repels up onto the underside of the apple and therefore increases the colour and colours up the apple faster so it can be harvested earlier and exported earlier. By having more colour on the underside of the apple it increases the amount of apples with the quality requirment of 75-100% colour on each apple and therefore has less rejects when they are being processed in the pack house. This increases the pack out percentage and therefore increases quantity. //

## PART C

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Justify which management practice you consider would have the greatest impact on the overall price received and/or the quantity available for sale by the producer.

Rootstock selection is the greatest managment practice to recieve higher prices as a result of higher quantity of apples being exported. For apples to be exported to Asian markets they have to meet certain attributes and requirments such as colour levels, russet levels and brix levels. Rootstock selection can directly relate to these 3 atributes, as well as getting apples to market faster.

- ~~rootstock selection increases~~ rootstock selection increases packout percentage/quantity and gains higher prices by increasing the colour of apples. By having a super dwarfing rootstock like the M27, there are less branches on a smaller tree, which means there is a higher rate of light penetration. This results in a higher number of apples reaching the 75-100% mark to apples being able to be exported to these asian markets, which means a higher packout percentage and more apples going to market.
- as mentioned the M27 rootstock also decreases the russet on each apple. to export to Asian markets apples must have less the 1cm$^2$ of russet. This is possable because of the smaller tree and less complicated tree, there isn't as much russet on each apple, so more apples get to market.
- Brix levels is the level of sugars in each apple, and is what gives it its sweet taste. for Asian markets they like a sweeter apple with a brix level of around 16 compared to the european market which like brix level of around 11. Brix levels are increased by having as much light penatration as possable. This is increased with the M27 rootstocks with the smaller trees and less complicated trees so more light penatration.
- Also with the rootstocks such as M27 allowing smaller trees there is more trees per hectear, so therefore more apples per hectear and

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Therefore ~~more~~ higher quantity of apples.

- The M27 rootstocks gain the growers a higher price as a result of timing. New Zealand supply to Asian markets when they have no domestic supply. This results in higher prices. But other countries like Chile also can supply these apples at this time, and for a lower price due to their low production costs. So New Zealand growers try to get their apples to market before Chile because when Chile apples arrives "The price drops $7 per carton" says Sonya White from Fernridge. So if New Zealand growers can get apples to market 2 weeks before Chile they will be getting $7 more per carton for longer, which therefore gets a higher price. Rootstock selection can get them to market earlier. M27 rootstocks ~~or~~ apples are in market ruffly 2 weeks earlier than a MM106 rootstock apple. This is because of the smaller tree M27 rootstocks only have to be picked twice to gain all the exportable fruit, where a MM106 rootstock has to be picked up to 6 times to gain all exportable fruit. Also the M27 rootstock apples have a higher pack out ~~percentage because~~ of brix levels, colour levels and russet levels. //

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E8

| Excellence exemplar for 91531 – 2016 | Grade Score: E8 |
|---|---|

| Question part | Annotation |
|---|---|
| A | The response provided information on consistency and uniformity requirements of apples for the Asian market and gave a good explanation, in part A and part C, why the market has these requirements. Specific details and data were used. |
| B | The response provided three management practices carried out during apple production, and explained how the management practices affect production and directly impact on quality and quantity. A good understanding of management practices was demonstrated, with the use of data and well-linked explanations for the three chosen management practices. |
| C | A full and comprehensive justification for the management practice – rootstock selection – and why it would have the greatest impact on the overall price received and the quantity available for sale for the producer, with relevant detail and data. |