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91531



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Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Level 3 Agricultural and Horticultural Science 2025

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

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 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 2–11 in the correct order and that none of these pages is blank.

Do not write in the margins (//////). This area will be cut off when the booklet is marked.

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

Merit

TOTAL 6

Page 1

INSTRUCTIONS

This examination has THREE parts. Carefully read ALL instructions and parts before answering.

You need to answer ALL parts of the examination using the **same** primary product.

You will need to discuss the market requirements of TWO separate markets (one market can be the domestic New Zealand market).

Name a specific primary product and two separate markets.

Primary product:

Market (1):

Market (2):

Using the market requirements listed below, you must select **different** requirements for each market.

Market requirements

- Price
- Timing
- Quantity
- Quality

PLANNING

Golden week:

holiday period of 7 days in japan

last from 29th april to 5th may

people give family and friends fruit/kiwifruit as a gift

golden week market requirements:

quality:

size - large

shape - oval

brix level - at or above 16.0

dry matter - 70% must be at or above .1

storing time - 7 days

blemishes - less than 1cm²

bruise - none

skin - smooth hairless

flavor - tropical passion mango flavor

seeds - more seeds the better

quantity:

average tray count - 29.3 per tray

timing:

29th april to 5th may

price:

premium pricing - can cost \$16 per kg

management practices:

supervine(quality, quantity, timing, price):

increases sunlight(photosynthesis - higher brix level), increased airflow(reduce frost risk), reduces labor, increased size, increases fruit yield, increases rate of photosynthesis.

canopy like structure

stronger structure - strong buds

high costs

increased dry matter - the portion of the fruit that is not water

girdling(quality, timing, price):

improve quality of fruit

disrupts the sugar flow through the phloem and causes the sugars from the leaves to transfer to the fruit.

increased sugar in fruit - higher brix level (will be at 11-13 be harvest time)

low costs

irrigation(quality, timing price):

improves quality of the fruit

irrigation is turned off a week before harvest so that the sugars in the plant are transferred to the fruit as the plant stresses.

increases dry matter

high costs and ongoing costs

pollination:(quality, quantity, timing, price):

high costs

hire bees or buy pollination - \$5000

male plant transfers pollen to female plant, fertilizing the female plant and causing buds to develop.

NZ domestic market:

quality:

size

shape

brix level - 16.0 - 6.2-7 at harvest time

dry matter - 70% must be at or above 16.8%

more tolerance for blemishes

no bruises

quantity:

average tray count - 31.8 per tray

timing:

Zespri supplies kiwifruit 8 months of the year. however working to supply kiwifruit all year round with kiwifruit orchards in the northern hemisphere in china japan france italy and greece.

price:

cheaper than japan's prices

TASK: Discussing how management practices meet market requirements

Market requirement for Market (1):

- (a) (i) For Market (1), explain one requirement that this market has. Use recent data to support your answer. In your answer, consider what the specific requirement is and why this requirement exists.

B I U

Golden week is a period of holidays in Japan that lasts from the 29th of April to the 5th of May. This market is a perfect opportunity for gold kiwifruit growers to export and sell their fruit from as there is a high demand for gold kiwifruit and many Japanese gift fruit to family and friends over the week. Timing is an important requirement for golden week as as there is only a short time where gold kiwifruit is in high demand and people are willing to pay premium pricing for it. It is also important for management practices as growers must list out the management practices, set times for them and organise went to harvest and export their gold kiwifruit. the gold kiwifruit quality also relates to the timing as the fruit must be at a brix level or 11-13 when ready to harvest with 70% of the fruit at or above 16% dry matter. This means that management practices such as irrigation and pollination are carried out in order for the fruit to be ready in time. for example, irrigation is usually turned off a week before harvest so that the plant stresses and the sugar stored in the plant are transferred to the fruit, increasing the brix level. This also increases the dry matter which is the non water portion of the fruit. higher dry matter means that the fruit will have more of the tropical mango passion-fruit flavour that golden week require in the gold kiwifruit exported there. The gold kiwifruits ability to stay at a high quality for a longer period also relates to the timing as the fruit must be able to be stored up to 7 days, so that the quality of the fruit will stay the same and customers will be satisfied.

Market requirement for Market (2):

- (ii) For Market (2), explain one requirement that this market has. Use recent data to support your answer. It must be a different requirement from that used for Market (1). In your answer, consider what the specific requirement is, and why this requirement exists.

B I U

NZ domestic market demands quality fruit all times of the year, however gold kiwifruit can only be supplied over 8 months of the year, due to seasonal change. although, Zesperi, a NZ kiwifruit company is working on supplying quality gold kiwifruit all year round as they have orchards in the northern hemisphere where seasons are opposite to New Zealand seasons, as NZ is in the southern hemisphere. quality of the gold kiwifruit is a market requirement that is vital for the success of the fruit and customer satisfaction. quality of the gold kiwifruit is measured in grades, where growers record the size, shape, brix level, dry matter, blemishes etc. and sell the gold kiwifruit that meets all the market requirement out of these factors. gold kiwifruit quality requirements are a larger kiwifruit with an oval shape and slightly more blemish tolerance than golden week, which has a quality requirement of less than 1cm² of blemishes. the brix level of gold kiwifruit in NZ is at or above 14.5 along with 70% of the dry matter in the fruit at or above 16%. the skin must also be smooth and hairless with no bruising and a firm texture. customer satisfaction is important for the continued access to the market as increased sales of the gold kiwifruit. If the quality is up to standard and meets market requirements, customers will be satisfied and continue to bu gold kiwifruit, resulting in more profit.

Management practices are carried out by producers in order to produce products that meet the requirements of the market.

Management practice for Market (1):

- (b) (i) Explain how this management practice enables producers to meet the market requirement. Use recent data to support your answer.

B I U     

Girdling is a management practice where a knife or piece of equipment is used to scrap away the outside of the plant trunk, where the sugar flow through the phloem is disrupted. This causes the sugars within the plant leaves to transfer to the fruit on the plant, causing the fruit to have a higher brix level. This management practice impacts the timing of the fruit development and ripeness as the fruit will be at the brix level standard of 11-13 at harvest and have a sweeter taste, which is exactly what golden week markets require in the fruit. This makes it a perfect management to carry out in order to get the gold kiwifruit harvested and meet quality standards in golden week. with the disruption in the sugar flow and phloem, the plant then speeds up plant life processes within the plant, therefore making the process of gold kiwifruit growing much quicker. This is important for golden week as it is earlier in the year and requires an earlier harvest, so it is vital that the gold kiwifruit are ready in time.

Management practice for Market (2):

- (ii) Explain how this management practice enables producers to meet the market requirement. Use data to support your answer. It must be different from the practice used for Market (1).

B I U     

Supavine is a training system for kiwifruit that is a canopy like structure. This structure has many benefits such as increased sunlight exposure, increased air flow, increased yield, reduced labour and increased fruit volume. Increased sunlight can help increase the amount of sugar within the fruit, increase the brix level and increase the dry matter. Sunlight is needed for photosynthesis to be carried out within the plant which is the plant life process of carbon dioxide and water using sunlight to create glucose and oxygen within the plant, helping the plant grow and store the glucose as sugars. with the increased sugar from the glucose stored, the plant is sweeter and higher in brix level. Increased airflow helps to reduce frost within the orchard. frost can damage the fruit in early development, therefore decrease the fruits quality. airflow can help regulate temperatures and keep the gold kiwifruit cool so that it does not ripen too quickly, as it will go old when it comes time for harvest. as the structure allows for easier pruning, thinning and harvesting work, the labour is reduced, allowing for the costs of growing the gold kiwifruit to decrease and profit to increase. Overall, the structure of supavine allows for each fruit to get the nutrients and sunlight they need to keep growing at a healthy rate and be at the quality requirements in time for harvest.

A major goal of producers is to earn a profit. Producers who meet a **broader range of market requirements** are likely to be more economically successful.

Select one management practice from part (b).

Management practice:

(c) Discuss why this management practice has a more significant impact on meeting the **market requirements** when compared to another management practice for your chosen product.

Use recent data to support your answer.

In your answer, consider:

- the **market requirements** this management practice has an impact on
- the impact this management practice has on the price received.

B I U     

The management practice of using the supavine training structure for the gold kiwifruit orchards has the most significant impact on meeting the market requirements for both golden week and NZ domestic market. The quality of the fruit increases as the increased sunlight, airflow and space to grow allows for the fruit to meet brix level standard, ripen at the optimal rate and grow to its full potential with increased volume, so that customers will be satisfied with their gold kiwifruit. Supavine also has an impact on quantity as yield increases as there is more opportunity for the gold kiwifruit to grow and have the space to grow to a large, quality kiwifruit. This increases the profit received from gold kiwifruit as there is more quality kiwifruit supplied and more customers buying them as they are quality. If more of the fruit is meets quality requirements, less will be wasted or thrown out as more will be sold in the market. The reduction in labour, as the structure is easier to prune, thin and harvest from, also contributes to low costs and more profit from the kiwifruit sold. With the gold kiwifruit being at a high quality, kiwifruit growers can sell their products at premium pricing, resulting in an increase in profit from each gold kiwifruit. The long-term effect of the structure is also another factor that contributes to the increase in profit as there is less costs of maintenance and repaired or installations of training systems in the future. This is significant compared with the management practice of irrigation as irrigation has a fix cost of the ongoing water supply for the plants. supavine is also a more effective management practice than girdling as the fruit are exposed to bot sunlight and airflow, which can increase sugars as well as cool down temperatures within the orchard. whereas girdling does increase th sugar within the plant, but does not help cool down the plants in any way. The long-term effect and little to no ongoing costs to keep the structure maintained allows for supavine to also be more effective than the management practice of artificial pollination as pollination can happen naturally without buying it and spraying it on the plants as well as supavine allows the fruit and plant to get nutrients in other ways as well. The benefits of reduced risk of frost, due to increased airflow, and reduce labour are big factors that make supavine more effective and significant than girdling, irrigation or pollination as there is less chance of kiwifruit being wasted because of frost damage and less costs for producing gold kiwifruit for the future years, therefore more profitable.

Merit

Subject: Agricultural and Horticultural Science

Standard: 91531

Total score: 6

Q	Grade score	Marker commentary
One	M6	The candidate explains the significance of meeting the timing requirement of kiwifruit into the Japanese market for Golden week and the quality requirements into the New Zealand domestic market. The management practices to meet these market requirements were well matched and well supported with quantitative data to explain in detail throughout the response.