

No part of the candidate's evidence in this exemplar material may be presented in an external assessment for the purpose of gaining an NZQA qualification or award.

SUPERVISOR'S USE ONLY

3

91531



Draw a cross through the box (☒) if you have NOT written in this booklet

+



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.

Excellence

TOTAL 7

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

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     

The Japanese Market has a very specific market requirement in regards to Quality. Quality is important as it represents the taste and other characteristics that make up the mandarin and influence the consumption and purchase. The Japanese have very specific standards for their mandarins as they are very particular and create a mandarin of a very high quality. In relation to Quality, the mandarins that Japanese Market need must have, unblemished skin, tight skin, perfectly formed, small in size (55-65mm), it must be a golden colour and sweet but low acidity in regards to taste which results in it having a 10:1 brix ratio. To achieve these attributes and requirements for a mandarin, it requires significant investment and substantial maintenance to ensure that it is perfectly achieved for the particular market. Quality is important as the Japanese Markets main use for their mandarins is for Japanese Golden Week which is from April 29th and May 6th. Golden Week is found to occur very early within the season as the mandarin season in New Zealand typically extends from April to August, however, the mandarins that are produced especially for Golden Week are seen to have a higher return, reflecting their quality through an \$8-12 return per kg. This is in comparison to the New Zealand market which the quality standard is significantly less specific with less attention to individual pieces of fruit, the allowance for the occasional blemish, easy to peel, puffy skin, a more tart flavour with a brix ratio of 10:1, larger in size (65mm+) and are typically wanted for everyday consumption through out the entirety of the mandarin season in NZ.

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     

The New Zealand mandarin market requirement when looking at Quantity is very important. The market for mandarins in New Zealand is less strict and specific in comparison to the Japanese market and this means that there is preference for different attributes and this also includes the quantity. Unlike Japan, New Zealand tend to enjoy mandarins throughout the entirety of the season as there is regular, everyday consumption as they are affordable and easy to acquire as they are available between from April to August in supermarkets, whereas in comparison to the Japanese Market which only requires mandarins between April 29th and May 6th for Golden Week. This also impacts and influences the quantities that are required for the different markets and how these differ. The New Zealand market through out the season produces between 7,000 and 10,000 Tonnes of Mandarins. This is because it allows for continual stock to be seen in supermarkets across the country right throughout the season. Also in relation to Quantity, The New Zealand market is also known to be less specific with attribute requirement, so mandarins are typically purchased in bulk quantities, which are prefilled bags, per kilo. For the Japanese Market in comparison, since the product is only needed for Golden Week they produce a significantly lesser quantity with around 700 Tonnes in total. Also looking at Quantity, the mandarins for the Japanese market is typically sold individually or in smaller quantities which is because of the particular characteristics and quality standards that are reflected within the fruit.

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     

Thinning is an important management practice for the Japanese Market. Thinning is the removal of fruit or plants to allow for the improvement and benefit of other surrounding fruit/plant. Thinning is crucial as it allows for the removal of low value fruit, blemished fruit and just any fruit that cannot be used for sale or consumption eventually. For mandarins, Thinning can be done both by hand and chemically. Hand Thinning is a more specific way to undertake thinning and for Japanese mandarins, they require at least 2-4 fingers in between each fruit. Hand thinning allows for assurance that any mandarins that are unusable are removed and that these are taken away before production resumes, and also the benefit for other surrounding fruits as it allows the other elements crucial for production to target these peices of fruit more thoroughly and allow for a better fruit of a higher quality to be produced. Chemical Thinning on the other hand is still an effective option just less specific to any individual fruit. This is the spraying of Giberellic acid at a concentration of 50ppm onto the fruit and this eradicates any unviable fruit that cannot be used for further production, sale or consumption. Chemical thinning is a more efficient process for thinning but it can still miss some peices of fruit which may be unusable as production continues given it is being sprayed onto the plant from a distance. Thinning is an effective option for producers as it provides a suitable option to allow a higher quality of standard for the viable fruit which can then be exported and consumed, but also it allows for efficiency within the line of production as it eradicates the fruit that is useless and this doesn't then have to be dealt with further down the track which may impact the quantity available, create delays or incur additional expenses. Hand Thinning is more suited to the production of mandarins for the Japanese Market given the incredibly specific requirements and attributes that are necessary to satisfy market demands. This is because it allows for careful examination and confidence to ensure that the most suitable mandarins are being produced further and exported to the market which then allows for a higher return, but also reduces the risk of unusable mandarins being sent into the export which may create customer dissatisfaction within the market. Chemical thinning although still a sufficient option for Japanese market, however may be more suited to the New Zealand Market as there is less concern over individual fruit within the NZ market and given that chemical thinning isn't specific to each individual fruit, it is a more effective option for New Zealand Mandarin Market growers. When growers are able to meet the specific market requirements for their particular market, this allows for a better quality fruit with perfect characteristics to be produced and therefore gain a higher return. Thinning allows this to be acheived more easily and provides assurance to growers in both markets. This has resulted in sufficient returns for the Japanese Market with it being between \$8-12 per kilo and \$3-4 per kilo for the New Zealand Market in return with the help of adapting Thinning as a management practice.

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     

Site Selection is important for the New Zealand Market. Site Selection is the place in which the fruit is able to grow, which takes into account many climatic factors and aspects which allow for production to occur and standards to be met. Mandarins are a citrus fruit which require very specific climatic conditions to allow for growth and a standard of quality to be produced. In regards to Climate, this is looking at Temperature, Wind, Frost, Soil, Weather Events and other factors which may impact the natural enviroment and the surrounding climate, making it either easier or more difficult for growth and production to occur. Mandarins prefer warmer enviroments with warmer winters and less frosts. Production thrives in 13-35 degree celcius growing degree days (GDD) which only can occur at optimum levels in specific places in New Zealand. In New Zealand, mandarins grow best for both the New Zealand and Japanese Market in Gisbourne and Northland. This is because they are both North facing slopes, are warmer enviroments in the country and have well drained, suitable soils to allow production to occur best. Kerikeri in particular which is found in Northland, is suitable for mandarin production due to its warmer winters and longer summers that allow for production standards to be maintained and possible for both markets. Site Selection is crucial as it allows for the production of Mandarins to be possible, due to the climatic conditions which are necessary for different aspects of growth as it would be unachievable in certain parts of New Zealand, but is also allows for specific market requirements to be met for both markets and allow for better standards of quality within the fruit. It is dependent on the climatic factors that are found within these areas which allow production to be efficient and of a certain standard of quality. When the fruit is produced in the particular climatic conditions, it allows growers to achieve results and produce a high quality product easier, as there isn't need for alternative solutions to aid and benefit production in certain aspects in which the climate isn't able to allow growth to flourish for different characteristics within the mandarin, it just allows production to occur smoothly as the grower is able to meet their market requirements and standards sufficiently easier.

- (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 ☰ ▾ ☰ ▾ ↶ ↷ ?

Site Selection is important for the New Zealand Market. Site Selection is the place in which the fruit is able to grow, which takes into account many climatic factors and aspects which allow for production to occur and standards to be met. Mandarins are a citrus fruit which require very specific climatic conditions to allow for growth and a standard of quality to be produced. In regards to Climate, this is looking at Temperature, Wind, Frost, Soil, Weather Events and other factors which may impact the natural environment and the surrounding climate, making it either easier or more difficult for growth and production to occur. Mandarins prefer warmer environments with warmer winters and less frosts. Production thrives in 13-35 degree celcius growing degree days (GDD) which only can occur at optimum levels in specific places in New Zealand. In New Zealand, mandarins grow best for both the New Zealand and Japanese Market in Gisbourne and Northland. This is because they are both North facing slopes, are warmer environments in the country and have well drained, suitable soils to allow production to occur best. Kerikeri in particular which is found in Northland, is suitable for mandarin production due to its warmer winters and longer summers that allow for production standards to be maintained and possible for both markets. Site Selection is crucial as it allows for the production of Mandarins to be possible, due to the climatic conditions which are necessary for different aspects of growth as it would be unachievable in certain parts of New Zealand, but is also allows for specific market requirements to be met for both markets and allow for better standards of quality within the fruit. It is dependent on the climatic factors that are found within these areas which allow production to be efficient and of a certain standard of quality. When the fruit is produced in the particular climatic conditions, it allows growers to achieve results and produce a high quality product easier, as there isn't need for alternative solutions to aid and benefit production in certain aspects in which the climate isn't able to allow growth to flourish for different characteristics within the mandarin, it just allows production to occur smoothly as the grower is able to meet their market requirements and standards sufficiently easier.

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 ☰ ▾ ☷ ▾ ↶ ↷ ?

Thinning in comparison to Site Selection, has more of a significant impact on meeting the market requirements for both the Japanese and New Zealand market for Mandarins. Thinning being the removal of plants/fruit surrounding the mandarins to allow for better production and growth for the remaining mandarins, it is crucial to allow for the idealistic standards to be met for both markets. The Japanese Market being more specific with their market requirements in relation to quality, size, taste and appearance, Thinning is crucial as it allows for the removal of any inadequate mandarins that will be unusable and pointless to eventually export as they are worthless and don't meet the market requirements. This is especially through Hand Thinning which allows for individual attention on each fruit to ensure that there are no low value and unusable fruit. This allows for the reduction and elimination of the possibility of blemishes on the mandarins which isn't acceptable for the Japanese market, it also allows the appearance to be considered in aspects of it being small in size, perfectly formed and tight skinned as it means that any fruit that doesn't align with these requirements can be removed. Thinning in relation to the Japanese market is crucial as it allows for an opportunity to remove any unusable fruit and a better possibility to meet the very particular market requirements. The Japanese Market is a very high value market with higher expenses and more intense production measures, but it allows for a high return to be reciprocated. The Japanese Market costs between \$3-4 per kilo for expenses and to produce, However in return it ranges between \$8-12 per kilo, which is significantly beneficial and ideal for the grower to receive a higher return in exchange for its high costs for production. The New Zealand Market on the other hand is less specific with their market requirements, as there is less concern about individual fruit, as long as it is easy to peel, puffy skinned, tart in flavour (7;1 brix ratio), larger in size (65mm+) and a few blemishes is acceptable. However, Thinning is still a sufficient option that allows for the removal of any mandarin that isn't usable or meet these requirements. Chemical thinning is more effective for the New Zealand market as it provides an efficient option to allow for the removal of these fruits whilst still allowing for market requirements to be met and the prospering of the other surrounding fruits. Hand thinning is also useful for the NZ market, however given the less specific market requirements, there is less concern for each individual fruit, unlike the Japanese market. Given the general use and consumption of mandarins by the NZ market, and the commonality and ease when acquiring mandarins, it is a relatively low value fruit. It requires less investment by growers as there is less strict standards for quality in place and it is relatively inexpensive to produce. At \$1-2 dollars per kilo to produce, it has a return of \$3-4 dollars per kilo in return for the growers which reflects the ease in production for the grower. Thinning is more significant in comparison to Site Selection, although it is still important, it allows the growers to more specifically and ensure the production will eventually meet the strict market requirements for the Japanese Market and even the New Zealand market, although less strict. Without Thinning, it would be harder for the growers to made profit as they may run into issues during export or final purchasing if the mandarins haven't been looked at properly to ensure standards and requirements are met. This may impact the willingness and likelihood of consumer purchasing and impact the profit the grower makes which could be detrimental depending on the amount that has been invested and spent on production, growth and expenses. When thinning is done correctly, it allows for the highest possible return in price for the grower and allows for substantial profits to be reaped. It has many benefits including meeting market requirements for both markets, creates a strong export route for the grower and many other positive aspects as they have improved their line of production and ensured a strong standard of quality within their fruit.

Excellence

Subject: Agricultural and Horticultural Science

Standard: 91531

Total score: 7

Q	Grade score	Marker commentary
One	E7	The candidate discusses how the use of the thinning mandarins has the most significance of meeting the quality and timing requirements into the Japanese market and makes a clear link to how this impacts the price the producer receives. The candidate made good use of quantitative data throughout to support their response.