National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

# Exemplar for Internal Achievement Standard

# Agricultural and Horticultural Science Level 1

This exemplar supports assessment against:

Achievement Standard 91929

Demonstrate understanding of factors that influence the purpose and location of primary production

An annotated exemplar is a sample of student evidence, with a commentary, to explain key aspects of the standard. It assists teachers to make assessment judgements at the grade.

New Zealand Qualifications Authority

To support internal assessment

| Grade: Achieved |
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| For Achieved, the student needs to demonstrate understanding of factors that influence the purpose and location of primary production. This involves describing the purpose and location of primary production and describing the factors that influence the purpose and location.<br><br>The student has described the purpose of growing kumara in Kaipara, with making a profit as the best described purpose. This has been described by including where it is sold and the markets it is sold in, the steady income all year, and who gets the money. The description could be strengthened by including what the profit is used for by a specific grower or situation. A historical purpose was identified as a staple food source and growing kumara in Kaipara for generations.<br><br>Factors that have been described are soil, temperature, and rainfall. The description of Kaipara as the location could have been strengthened by including a variety of points such as where it is stored, how far away the markets are, and how the kumara are transported there.<br><br>For Merit, the student could explain how the soil, temperature, and rainfall affect growing kumara in Kaipara to make profit. |

Achieved

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# Kumara production in Kaipara".

Add photo

## About Kumara

- What is Kumara?
  Kumara is a root vegetable that grows underground that belongs to the bindweed or morning glory family, its grown in new zealand as a major crop for northland in september they get planted and around January to April they are harvested, kumara is  also known as sweet potato and it is a starchy and sweet tasting.
- Who eats it? (Culturally importance) How is it culturally important to some people's diets.

Kumara is a staple for maoris as a main food source and was brought over to new zealand by the maoris in the waka. It is used as a base food in hangis and other polyneisain cultural foods, Kumara can be stored witch means back in the day when it wasn't kumara season they could store it for later use to provide them throughout the year and also were able to be stored as they travelled on the waka witch made it an easy food source, it is also a starchy carb food which meant it was a good energy food and healthy

https://www.lovekumara.co.nz/we-love-kumara/

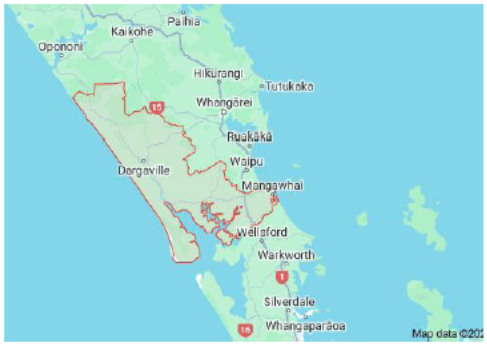
https://teara.govt.nz/en/kumara/print

# Where is kumara produced?

All of our kumara is grown here in the north of New Zealand. The sunny, tropical Northland climate and its rich soil are what kumara love. With all our produce entirely New Zealand grown, you can trace each of our kumara back to the paddock it was grown in.

Dargaville is the Kumara Capital of New Zealand as 95% of kumara you'll find in the supermarket comes from the Kumara Capital.

https://fieldco.co.nz/where-is-our-kumara-grown/



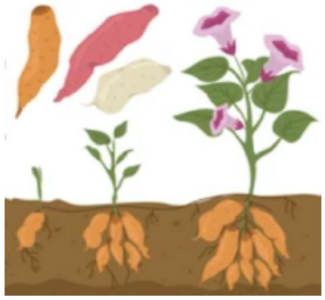

# Purpose of growing kumara

- Cultural connections/ historical reasons/ origins of whenua –

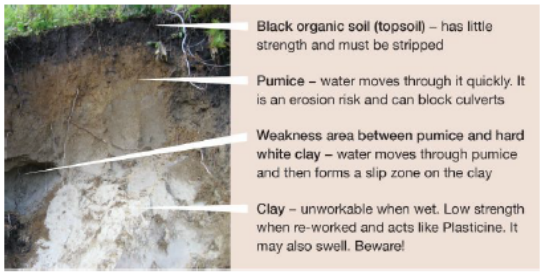
The purpose of growing Kumara is for many reasons such as exporting and selling in markets all over nz where the Kumara can be used for many different food purposes, witch then provides a continuous income year round because of the amounts of kumara being exported to keep the supermarkets supplies full. Another purpose is for the people needing a job and a source of income for workers, Kumara is also a maori traditional food and has been for many years, back when Māori were voyaging they used the Kumara as a main food source in there wakas for while they were travelling, they bought the Kumaras also known as sweet potatoes from south america and they have continued to be a popular food for everyone in nz and is very well known and provided because of the really good suited land space and tendency we have in the kaipara to keep them growing and maintained.

- Making a profit – The kumara produced from the kaipara goes around in the region being sold in markets and supermarkets and good for local towns like ruawai the kumara capital, dargaville, whangarei and other places in the kaipara, making good profit means more money for business and for farms who grow and produce these plants.

## Why is Kumara produced here?



It's because of the shallow clay bed that makes up a lot of the land on the river plains near the Wairoa River. Kumara grow well in the alluvial plains of the northern Kaipara Region. Rich topsoil of the river plains is furrowed to a depth which ensure a good-looking well-shaped kumara crop. This shallow clay bed means the kumara, which is a root crop, grows to a good depth, before hitting the clay layer.



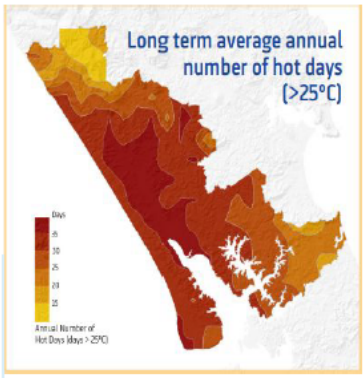

Another reason is because the Kaipara region also has a very tropical climate, with warm summers and very mild winters. Kumara are a subtropical plant, grow best in tropical areas. The average temperature in the Kaipara is relatively high with our warm nights and high sunshine hours. We typically have more sunshine than other parts of Northland even.

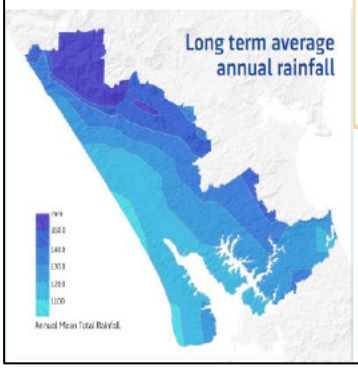
- What kind of climate do we have in the Kaipara?

In our kaipara region the climate can be described as mild, humid and windy because of its northern location, in summer its warm and humid while in winters its mild. Rainfall is typically common year round with occasionally having very heavy falls, although dry spells and drought can occur especially during the summer and autumn months.

https://www.kaipara.govt.nz/uploads/kickstart/Infographic_Kaipara_Climate.pdf

# Temperatures in Kaipara




- Talk about the temperature averages the Kaipara receives, include maps.

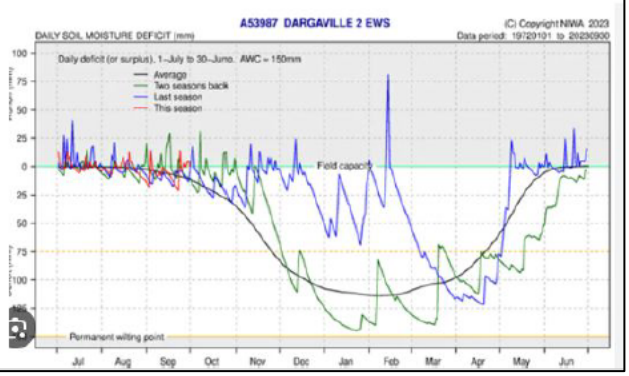
During the summer most of the district observes an average of 25-40 hot days (days with temperature >25°C) per year.

During the winter months the annual average rainfall for most is between 1,100mm and 1,400mm Summer total rainfall ranges from 225-300mm, tropical cyclones, or storms of tropical origin, affect Kaipara from time to time. These weather systems usually bring heavy rain and strong winds to the area.

https://www.kaipara.govt.nz/uploads/kickstart/Infographic_Kaipara_Climate.pdf

# Rainfall in Kaipara

The rainfall in the kaipara helps the kumara grow but if too much rainfall occurs like a cyclone or storm the kumara can get flooded and drown. Well watered, well nourished kūmara will have a better chance of keeping insect pests and diseases away.



# Evaluation of growing Kumara in Kaipara

Here you will include all the factors which have led to kumara being grown in Kaipara and evaluate their relative importance to the **purpose** and **location**. (Go back to your slides for understanding of Purpose and Location, you must make the links to the factors).

This is your summary.

This is my evaluation of how and why Kumara are grown in the Kaipara. Kumara have been grown in the Kaipara for generations. As I have already stated, one purpose of Kumara being grown in the Kaipara is the cultural history and importance, like how it was easily stored during long journeys and also the trade value. The location in the Kaipara is perfect for growing Kumara because of its mild and sunny climate year round with not a lot of rainfall to drown the Kumara crops. The land space used to grow the crop is also suited for Kumara because it's all flat straight land which makes it easy for machinery and growers to work.

| Grade: Merit |
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| For Merit, the student needs to explain factors that influence the purpose and location of primary production. This involves explaining the purpose and location of production based on the influence of contributing factors.<br><br>The student has explained how soils and rainfall influence the location and the 'producing income' purpose of beef farming in the Waikato.<br><br>The influence of soil has been explained by linking the composition of the soil with its draining and cultivating characteristics, and then linking this to pasture growth, cattle growth rates, and (by implication) profit. Rainfall has been explained by linking the high rainfall and the avoidance of the cost of irrigation to the high growth rate of pasture and the fattening of stock.<br><br>This evidence could be strengthened by linking the high rainfall through to the purpose of producing income, and including data and explanation for a specific Waikato beef farm.<br><br>For Excellence, the student could analyse the factors and make a judgement for the evaluation. The supporting detail should relate back to both the purpose and location – producing as much income as possible from beef farming in Waikato. |

Merit

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Beef production is the process of producing the primary products of raw beef and hide which is sold to smaller businesses refine the primary product into a product that can be sold in stores. A Farmers purpose when producing beef is primarily producing as much income as possible through the sales of primary products such as the cows that are sent to slaughterhouses. However, other purposes such as feeding the community with beef produced from the farm are prevalent when producing beef (although profit is the thing most often in mind when selling to people). Farms passed on through families are more likely to carry on farming the land as farmers raised on the farm have the knowledge and skills required to continue beef production causing continued production as the farmer attempts to continue the family business. If suitable land is owned, beef production may be the easiest employment found by the farmer encouraging them to continue farming and producing larger profits as they find purpose in the purchased land.

While beef production may be found throughout New Zealand the largest amount of beef production is farmed and sold in the Waikato region of the north island. The north island contains 71% of beef farms with 34% being spread across Waikato, northland and the bay of plenty. 25% of herds are distributed on the east coast with Canterbury and Westland containing another 18%. The total profit produced by the beef industry sits around 3.7 billion dollars a year. Canterbury holds the largest amount of beef cattle- 542,145 in June of 2023 followed by Manawatu-Whanganui at 517,451 and Waikato in third place with 513,735. Although Waikato may not have the largest number of beef cattle it does have the largest amount of beef producing farms -2,436. In comparison, Canterbury only has 1,458 beef farms despite the larger number of beef cattle.

Physical, climactic and market factors have a large impact on the type of production available in any given region of New Zealand. Physical factors such as topography and soil fertility impact the kind of crop or animal available to farm on the land. For example, dairy production systems prefer flat or rolling land to allow the cattle to gain weight at a profitable rate due to the far more fertile planes and hills. Large rolling hills are not preferred in dairy farming as it uses energy that the cow could have used to create milk, therefore, beef farming is far more profitable on this land as larger hills can be utilized to graze the cattle. Climactic factors such as sunshine hours may change the type of production systems available in the region. High sunshine allows more photosynthesis to occur in the grass and other plants in the pasture ensuring a stable, nutritious food source for the cows. Market factors such as the availability processing plants and distance from major ports or airports may affect where a farm is built due to needs such as slaughterhouses and freezing works that are need after the

stock is taken off the farm.

The purpose and location of beef production is highly depended on the physical and climactic factors of the region as unfavourable topography or low amounts of rain may entirely prevent beef production taking place in the region. The carcass weight and therefore the profitability of stock may entirely depend on the quality of pasture the cattle are grazed on as good grass causes more weight gain. Good soil is especially important in the development of quality pasture in a beef production. Loam is a highly fertile soil known for its excellent pasture quality commonly found in the Waikato plains. If suitable soil is not present on a property, the pasture produced may be poor quality yielding worse results in cattle growth than fertile soils. High rain fall (1200mm-2400mm over the Waikato) is important in beef production as it provides ample drinking water for the stock and steady water for the soil and plants in the pasture providing high growth rate of grass providing feed to fatten up the stock.

While many factors have a large influence on why and where beef is produced in New Zealand, the quality of soil may have the biggest impact of all. The biggest producer of beef, Waikato is a prime example of fertile soil as the loam soils mixed with volcanic ash cause it to be both free draining and easy to cultivate, growing rich and plentiful pasture supporting large herds of beef cattle. Without fertile soil, pasture is slow growing and poor quality leading to slow growth rates and a loss of profit as cattle don't reach their full weight and being sold for less than they would be at a higher weight. Poor soil requires large amounts of fertilizer to ensure pasture growth taking money and time that could be used to better other parts of the production system. Although soil may have a large part in the success of beef production, rainfall may be even more important than the soil. High amounts of rain are beneficial for beef production as cattle require a large amount of drinking water per day to remain healthy as well as high rain for the continued growth of pasture without the need for extra irrigation which costs the farmer time and money that could be otherwise spent on more important tasks. Although both good soil and high rain are required for a beef production to take place in New Zealand, rain would not matter if the soil quality were poor and didn't produce good pasture. Therefore, soil quality has the largest effect on why and where beef is produced in New Zealand.

| Grade: Excellence |
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| For Excellence, the student needs to evaluate factors that influence the purpose and location of primary production. This involves evaluating the purpose and location of production based on the influence of contributing factors.<br><br>The student has explained how soils and rainfall influence the location and the 'producing income' purpose of sheep farming in Canterbury. The explanation could be strengthened by linking the factor with the actual location and the purpose.<br><br>The student has evaluated aspects of rainfall and topography for making money from sheep farming in Canterbury in a structured and final section of the report. The arguments in the evaluation have been developed by comparing the two factors and giving negative and positive impacts.<br><br>In the final paragraphs, the arguments have been summarised and linked to a difference in the impact on sheep production and the purpose of making money. Rainfall has been judged as the most influential factor.<br><br>The description of purpose could be strengthened by including features such as the specific use of the money, the products sold, who buys the products, and where they are sold. The description of the factors influencing location could be more specific and give details for the particular location, e.g. the name of the processing plants, where the markets are, the distances/costs of transport, the actual topography where the sheep are farmed, the land value, etc. |

**Achievement Standard 91929: Demonstrate understanding of factors that influence the purpose and location of primary production**

A description of the purpose of sheep production

The purpose of a farmer producing Lamb in Canterbury is for an economic purpose of making money for the farmer. The farmer wants to make money so he and his family can survive and so he can put more resources back into the business so he can make more profit. The farmer sells the lambs to the freezing works who processes them and sells the meat to large retailers overseas like Walmart in the United States.

A description of different factors that affect sheep production in Canterbury

3 factors that would affect canterbury is Rainfall, topography and access to markets (ports and works).
Canterbury gets an annual rainfall of 400-1200 millimetres of rainfall per year. This has an impact on pasture growth and food for the animal. Farm types like sheep don't need as much rainfall for high pasture growth because sheep are hearty animals (can survive on less quality feeds and still be in a good condition to sell/make money) and the farmer won't have to irrigate/ put costs towards pasture growth.
Canterbury has topography of plains/ hill country. The closer the farm is to the coast the more flat it is/ the further the farm is to the west the more hilly it will be. Flat land will allow for machinery to easily work the land therefore increasing the quality of nutrients in the soil or pasture growth so it will allow for more intensive systems that rely on good soils/ pasture to be able to be farmed there. If the topography is more hilly it will be harder to get machinery on it/ cost less and may not be worth it for what is produced. This will limit what can be farmed there. On hills generally sheep, beef, deer and some dairy depending on the size of the hill can be farmed there.
Christchurch is in the middle on the coast of Canterbury. It has an air and seaport in it. This will allow easier access for farmers to the port and will improve the quality of the product and lessen the expenses of transportation.

An explanation of how factors affect sheep production in Canterbury

Rain has an impact on the production of sheep in Canterbury because if there is not adequate amount of rain for pasture growth then there will not be enough feed for the animal to grow and increase their body condition score. This impacts how much money the farmer will make. Sheep are hearty animals and don't need a lot of feed. Canterbury is a dryland because it only gets 400-1200mm of annual rainfall per year. This affects the production of sheep because although they can grow and live on dryland pasture/grass species like cocksfoot they won't be of a high premium quality like an irrigated pasture fed sheep will be. This will impact the bread of sheep the farmer will farm because different breeds are suited to grow and survive/thrive on land with lower amounts of rainfall. Low rainfall will also affect how much feed there will be so the stocking rates may be lower. This will affect how

intensive the farm is and how many workers the farm may need therefore effecting the success of production.

Topography affects the production of sheep by how hard they have to work for their food. If the land is on a steep incline than the sheep will have to work harder for their food therefore putting more energy into finding food and less into growing quality meat. If the quality and quantity of meat is not high than the farmer will be making a lower amount of money. If the land is steep or quite hilly it will impact if the farmer can work the land. If they can't get machinery on the land than they can't work it/ put nutrients in the soil, improve soil quality or irrigate it. There may be less nutrients for the sheep to eat/ get. Therefore if they have less nutrients in their body they may be more prone to diseases which would decline their body condition score. The farmer would get less money for it and would therefore decrease the productivity of the land.

Access to markets/ports or processing places affects why we grow sheep in canterbury because if the markets are far away it will cost more to transport them to the works. There also might be more  chances of suffocation or bruising which would cause meat quality to decline because of the sheep travelling so far and being in a confined space for so long. Unnecessary transportation costs would also be less economical for the farmer. There would be less profit because funds are being put towards excess transportation where they could be put into other more beneficial places on the farm.

<u>The factor that has the largest effect on the purpose of the production of sheep in Canterbury is Rainfall.</u>

<u>An evaluation of the selected factor with other factors that influence the production of sheep in Canterbury by comparing and contrasting.</u>

Rainfall has the largest effect on farming sheep in canterbury to make money. Canterbury has wet winters and dry summers although not a lot of rainfall occurs in an annual year. Canterbury gets an annual rainfall of 400-1200 mms per year. The positive of this rainfall is that it can improve the quantity and quality of pasture because it is allowing the plants to go through its processes like photosynthesis more often. This means that the plants can grow and become better feed sources for the sheep. If the sheep get more feed that means their body condition score will increase meaning their carcass/meat should be at a good quality therefore making the farmer more money. This has a bigger effect on sheep farming than topography does. Topography has a smaller effect on sheep production than rainfall has because the positives of it does not affect sheep farming as much. Topography can create shelter for sheep in steep gullies in bad weather. This prevents the sheep from getting uncomfortable, meaning that they will remain comfortable in their environment. Sheep do not decline in health if they uncomfortable temporarily from weather so shelter from bad weather is not a major priority unlike when looking at rainfall and grass growth. Another positive of hill country is that other animals (unlike sheep) cannot be sufficiently farmed on the slope of topography of the hill country in Canterbury. Dairy, crops, market gardens or other farming types where machinery or good quality pasture is required cannot be farmed on hills. The expenses and resources required for those farm types to run are too large for the gain/income they will get from it. So, the topography favours sheep more than other

intensive farming types. This influences sheep production because more land can be specifically farmed for sheep therefore increasing the farmers income.
The positives of rainfall compared to topography has a bigger impact on sheep farming because the amount and quality of feed is crucial for sheep growth whereas sheep being comfortable and land availability is not as crucial for sheep production.

The negatives of Rainfall have a bigger impact on sheep production in Canterbury hill country than what topography has. If there is too little rainfall than a drought may occur resulting in less and lower quality feed. This may occur during summer if there is not sufficient rainfall during the winter in Canterbury. If there is not enough feed during the summer than stocking rates may decrease and the body condition score of the sheep may also decrease therefore decreasing the farmers income. If there is to much rain in winter or any time of year pugging may occur in a block that has a high amount of stock in it for it's size. This will decrease the plant growth therefore impacting the feed for sheep. There may be less feed for sheep because of this the quality of the animals body condition score may decrease. Therefore leading to less income for the farmer. Another negative of too much rainfall is increased bacteria growth. When it is wet the ground gets soft and the sheep's feet will get softer and more prone to diseases. Foot rot can be a result of this and will make the animal less productive and will cost more resources for the farmer. Less productive animals means they won't eat as much and will impact the farmers economic viability of the farm by decreasing it.
These negative factors of rainfall have a bigger impact on the farms production than the negative effects of topography has.
The negative effects topography has is that animals have to work harder to get their feed. If the country is on a steep incline than the sheep will have to use more of their energy getting their food rather than using that energy growing. This limits the farmer by selecting different breeds of sheep to farm but does not limit the farmer, farming sheep. They can still farm sheep on steep hills. Another negative of topographic hill country is that you can't irrigate and use machinery on there. This impacts the farmer by not being able to increase the soil and pasture quality. Sheep can still grow on low quality pastures so the farmer not being able to work the land does not have a big impact. There will still be feed on the hill and the sheep can still get nutrients.
The negatives of rainfall have a bigger on sheep production than topography does. In justification, rainfall effects soil quality, grass growth and diseases in sheep. These all have significant negative impacts on the farmers purpose of production. If there is no feed or a high rate of bacteria infections in his mob than he will not make a lot of money and therefore may not be able to farm sheep effectively in Canterbury hill country. Topography effects how hard the sheep have to work for their feed and if the farmer can get machinery on the land. The farmer can still farm sheep although it might not be as effective as it can be but it will not have a major impact on his decision to farm in Canterbury hill country.

In Justification rainfall has a bigger effect on sheep production than both topography and access to ports/ processors. The positive and negatives listed above for rainfall will impact a farmers decision on farming sheep on canterbury hill country for money. Topography and access to ports and processors will not have an as big effect on sheep production.