Māori in horticulture

Horticulture New Zealand

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Horticulture™ New Zealand
Ahumāra Kai Aotearoa

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Snapshot of Māori in horticulture 2024

7.4%

Māori share of New Zealand horticulture land

10.5%

Share of onion land

12.2%

Share of kiwifruit land

50.4%

Increase in Māori horticulture land since 2017

1.1%

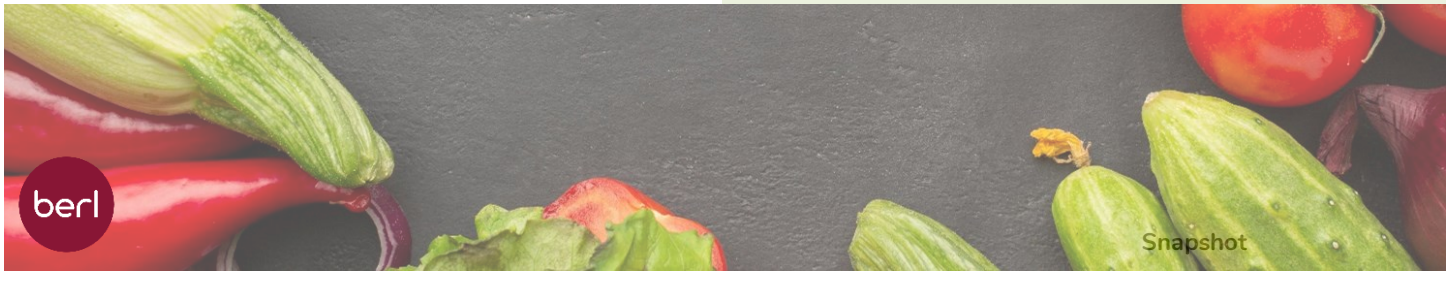
Of Māori land used for primary production in horticulture

$305 million

Gross output on Māori horticulture farms

Nearly **4,000**

Māori workers employed in the horticulture sector (17% of total)



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1 Introduction

Horticulture New Zealand (HortNZ) commissioned Business and Economic Research Limited (BERL) to estimate the size, share, and growth of Māori participation in the horticulture industry. This report updates the previously completed BERL research, Māori in Horticulture (2020).[1]

This report is a strictly desk-based research project that compiled and collated data and information from a variety of sources. It is intended that this report be used as a basis for understanding the current Māori participation in the horticulture sector, as well as how it has changed since 2020. Where at all possible, we have maintained consistent data sources and methodology with the previously completed research. It is noteworthy that the dataset utilised for this analysis may exhibit limitations in certain areas due to changes in data availability and quality since 2020.[2]

1.1 Context

New Zealand had an estimated 131,300 hectares of horticulture land in 2023, producing food for both domestic and international consumption and generating around $4.65 billion of export revenue (excluding wine exports) each year. The horticulture industry is already a substantial part of New Zealand's total exports.

In certain regions of New Zealand, including the Waikato, Hawke's Bay, and Gisborne, horticulture is a critical part of the local economy. Other regions of New Zealand with a suitable climate, such as Northland, have horticulture opportunities that have emerged, and the local horticulture industry may grow substantially.

Māori involvement in horticulture is diverse and expanding, from Māori individuals and businesses to iwi and their commercial arms. Although Māori entities account for a relatively small portion of horticulture land in New Zealand at present, this sector has been experiencing consistent growth. Currently, Māori entities have large tracts of pastoral and forestry land, with a smaller proportion of land in horticulture. There is an ongoing drive to transition suitable land to horticulture, as the opportunity arises, due to its relatively high value compared to more traditional agriculture uses. At present, there is limited information on the size, scope, and level of participation of Māori entities in the horticulture sector.

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[1] Green, S., & Schulze, H. (2020). Māori in horticulture. BERL.

[2] Appendix A details the data sources and methodology used.

2 Data and limitations

Data on New Zealand's horticulture industry at an aggregate level is largely available and reliable. There are some slight differences depending on the sources. However, data and statistics on the participation of Māori in horticulture are more limited. A wide range of sources are required to estimate the size and share of Māori in horticulture.

Throughout this research it became apparent that the need for more accurate, timely, and available data on Māori participation in horticulture is needed to better inform decision makers and policy.

2.1.1 Industry data

The primary source of aggregate industry statistics is from Fresh Facts. These statistics include land use, production volumes, and export value of horticulture products.

Data on the Māori horticulture industry has been collected from as many sources as possible. Stats NZ Tatauranga umanga Māori data from between 2017 to 2023 was used to establish baseline estimates. This information includes all Māori businesses and entities where the owners self-identify Māori ownership and management of the farms in the business operations survey. Additional information was collected by exploring press releases, news media, government reports, and relevant websites. This was done to ensure a full encompassment of Māori horticulture businesses and entities, including those that started operations post the business operations survey.

Horticulture associations and industry bodies typically do not collect information regarding the ethnicity of their growers.

2.1.2 Employment data

Employment statistics are primarily sourced from New Zealand Census records. Records have been obtained for occupation, industry, and employment status from Stats NZ for the 2018 and 2023 censuses. Additional information, such as the employment per hectare, has been sourced from sector research.

2.2 Limitations

While horticulture data on a national level is of very good quality, data on Māori horticulture in New Zealand is limited. While there are two Māori horticulture collectives, Māori Kiwifruit Growers Incorporated and Tāhuri Whenua Incorporated Society, attempts to obtain data were unsuccessful.

Stats NZ also collects data on Māori horticulture. The Stats NZ Tatauranga umanga Māori research is used as a baseline of Māori entities in horticulture. This includes information on Māori authorities, and small and medium-sized Māori businesses. This data is not complete. Stats NZ notes that small businesses, with a turnover of less than $30,000 and under six employees, are excluded.

Due to the small scale of Māori horticulture, the agricultural statistics focus on pastoral farming and forestry and not horticulture.

The 2023 Census data was used for the employment section of the report. However, the data does not necessarily reflect the horticulture industry throughout the year, as employment fluctuates seasonally. The 2023 Census was undertaken in March, which is the harvesting time for apples but is too early for other harvest seasons such as kiwifruit.

3 New Zealand horticulture industry

New Zealand's export market has always been dominated by the primary sector, although the types of exports have been constantly changing. Early exports were dominated by flax and native timber, followed by the rise of wool. Apples emerged in the export market in the early 1900s and are still one of the major export crops from New Zealand. Primary sector exports are now largely dominated by dairy, exotic timber, and kiwifruit.

The New Zealand horticulture industry has existed in an environment of constant change, although land use for all horticulture crops has been relatively steady over the past ten years. However, the high-value crops have quickly grown the value of horticulture exports. The horticulture industry now injects almost $4.65 billion per year into New Zealand through exports[3], while wine returns another $2.4 billion per year.[4]

The following section provides a high-level overview of New Zealand's horticulture industry, from fruit to vegetables, between 2002 and 2022. For consistency, we have presented data available from the Stats NZ Agricultural Survey. This is the latest data available. Due the nature of the horticulture sector, with slow land use changes, it is unlikely that there have been major land use changes since the 2022 dataset, making it appropriate to use to estimate the Māori share of horticulture in 2024. We recognise that industry data sources may not exactly align with the data presented, for a multitude of reasons.

3.1.1 Fruit

Over the past 20 years, the fruit industry has undergone structural changes. It has been characterised by periods of rapid growth or transition in specific areas, followed by stabilisation and steady growth. Historically apples were the dominant fruit export crop in New Zealand, which was superseded by the rise of the kiwifruit industry (Table 1).

[3] United Fresh and Plant & Food Research. (2024). Fresh Facts 2024: New Zealand's Fresh Fruit & Vegetable Industry. Retrieved from; https://www.unitedfresh.co.nz

[4] New Zealand Winegrowers Inc. (2024). New Zealand Winegrowers Annual Report 2024. Retrieved from; https://www.nzwine.com

Table 1 Hectares of fruit land in New Zealand (2002, 2012, and 2022)

Fruit	2002	2012	2022	Change (%)
Apples	11,717	8,845	9,811	-16
Kiwifruit	11,841	12,757	14,686	24
Avocados	3,106	4,149	5,283	70
Citrus	2,097	1,857	1,673	-20
Nuts	1,456	1,344	711	-51
Olives	2,612	1,657	693	-73
Summerfruit	2,916	2,276	2,277	-22
Berryfruits	2,704	2,598	1,869	-31
Other fruit	1,981	1,661	1,277	-36
Total fruit	**40,430**	**37,144**	**38,280**	**-5**

Source: Stats NZ

Olive orchards have significantly decreased in size, with a 73 percent decrease from 2002 to 2022. This is likely to have been driven by land use changes, as olive growers convert their orchards to more economically profitable alternatives. In 2012, 216 hectares of land in the Wellington region was dedicated to olive production; by 2022 it had fallen to 169 hectares, while wine grape production had increased by 301 hectares. A similar trend is observed in nut orchards, which were relatively stable between 2002 and 2012, followed by a decrease of 58 percent between 2012 and 2022.

Kiwifruit industry

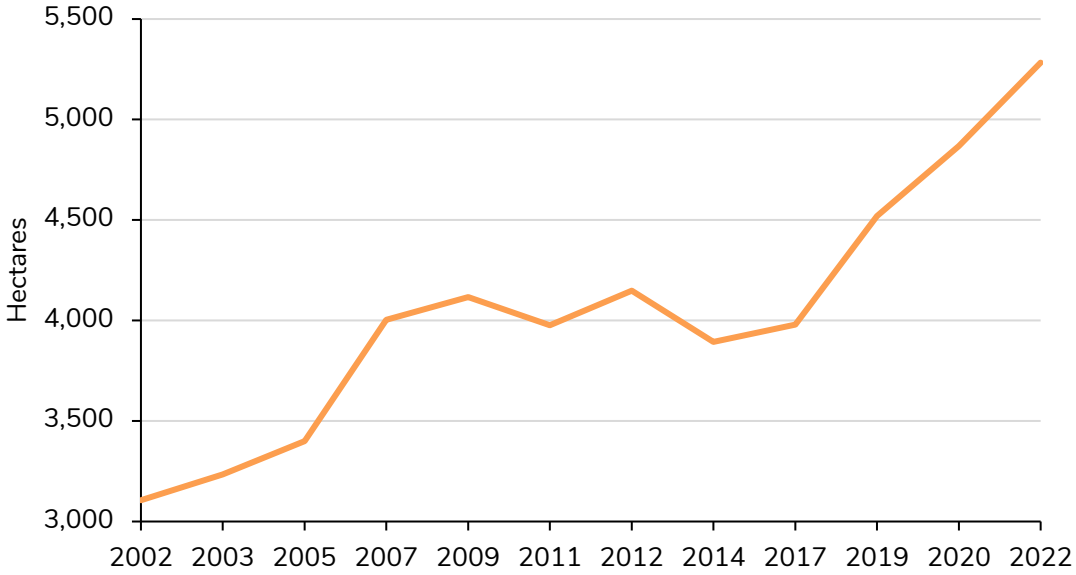
The kiwifruit industry is the largest fruit-producing industry in New Zealand, with consistent growth in the number of producing hectares over the past 20 years. The industry appears to have fully recovered from the disruption (starting in 2010) of the Pseudomonas syringae pv. actinidiae (PSA), with kiwifruit orchards reaching a new peak of 14,686 hectares in 2022.

Production of green kiwifruit has decreased from 9,500 hectares in 2012 to 6,458 hectares in 2022, while gold kiwifruit has increased from 3,070 hectares to 7,785 hectares over the same period. This reflects shifting consumer preferences for kiwifruit varieties, and the leveraging of new export markets, resulting in a strong increase in the profitability of the kiwifruit industry. Kiwifruit exports are now valued at $2.6 billion annually.

Avocados

The size of avocado-growing land in New Zealand has grown solidly for two decades, increasing from 3,106 hectares in 2002 to 5,283 hectares in 2022. A contributing factor for this has been the improving economic viability of avocados with strong export and domestic consumer markets.

Figure 1 Hectares of avocado land in New Zealand (2002-2022)



Source: Stats NZ

3.1.2 Vegetables

The vegetable industry in New Zealand has similarly been through a gradual transformation. Despite New Zealand's population from 2002 to 2022 growing by 30 percent (3,948,500 to 5,117,100 residents), land dedicated to growing vegetables has decreased by 14 percent.

While 51,358 hectares were dedicated to growing vegetables in 2002, this decreased to 44,206 hectares in 2022 (Table 2).

Table 2 Hectares of vegetable land in New Zealand (2002, 2012, and 2022)

Vegetables	2002	2012	2022	Change (%)
Beans	835	1,186	1,043	25
Brassicas	3,867	3,622	3,156	-18
Carrots	1,831	2,047	1,770	-3
Kūmara	985	1,228	1,318	34
Lettuce	1,287	1,250	957	-26
Onion	5,621	5,718	4,884	-13
Potatoes	11,082	11,578	8,424	-24
Squash	6,560	6,837	4,800	-27
Sweetcorn	5,790	4,664	3,320	-43
Other vegetables	13,500	12,628	14,535	8
Total vegetables	**51,358**	**50,758**	**44,206**	**-14**

Source: Stats NZ, United Fresh and Plant & Food Research

It is likely that multiple factors have contributed to this trend, but one documented factor has been urban expansion reducing the availability of versatile productive land.[5] In addition, vegetable crops are more vulnerable to weather changes than trees. For example, they can be subject to crop destruction and droughts. Other reasons include the regulatory burden, which increases operational costs for vegetable growers.

Kūmara, a traditional crop in New Zealand, is almost entirely grown in the Northland region which produced 96 percent of kūmara in New Zealand in 2022. Sweetcorn and squash, which were the primary crops of the Gisborne region, have seen a production decrease by 31 percent and 41 percent, respectively, from 2002 to 2022.

Total vegetable production in Hawke's Bay has decreased by ten percent between 2012 and 2020, from 8,813 hectares to 7,963 hectares. This appears to be a result of a shift towards wine grape production. A similar decrease can be observed in the Waikato region, although this appears to be because of the rise of the dairy industry.

Alternating crops

Vegetable growing follows different business models to growing fruit. Rather than planting and maintaining trees for potentially years before harvest, vegetables are typically planted and harvested within one year. As a result of the shorter timeframe of vegetable growing, the processes and practices differ from growing fruit trees. Vegetables typically do not develop deep root systems to pull nutrients from deep in the ground; instead, they rely on nutrients present in the topsoil layers to provide their nutritional needs.

To prevent the depletion of topsoil nutrients, vegetable crops can be grown in an alternating cycle. This crop rotation involves growing different species that create beneficial conditions for each other. Crop creation can create optimal soil conditions, minimise pests and, therefore, improve the harvest each year. In Gisborne, squash is often alternated with sweetcorn with each crop complementing the other and improving the harvest of both.

[5] McClung, R. (2018). *Can vertical farming replace New Zealand's productive land to deliver high quality fruits and vegetables in the future.* Retrieved from; https://ruralleaders.co.nz/wp-content/uploads/2022/12/McClung-Rachel_Vertical-Growing-in-NZ_Kellogg-report.pdf

4 Māori in horticulture

4.1 History of Māori in horticulture

Horticulture, and more broadly the practice of leveraging the land to provide food, has long been a core practice for Māori. Early Māori explorers brought with them a wide array of tropical crops, six of which were successfully cultivated, including yam, gourd, taro, and their main crop, kūmara.[6] Once settled, two species of cabbage trees (tī pore and tī kōuka) were also cultivated. Due to New Zealand's cooler climate, crop cultivation was restricted to the North Island and the upper reaches of the South Island. This climate disparity was fundamental to early Māori trade networks, with crops grown in the warmer regions gifted and traded to the cooler, less horticulturally productive regions of the country.

Traditional Māori horticultural methods suggest that they were expert cultivators of the land, using sustainable horticultural processes. To initially set up a farm or māra (garden), the existing forest was burned and clear-cut. The bare land was then improved via ditches, fencing, and soil modifications to improve fertility, control water levels, and keep out pests, especially wandering pūkeko.[7] A māra was cultivated for around two to six years before allowing a fallowing period during which the māra returned to bush. Māra, where communally operated, had up to five hectares of food production providing food for residents.

Following European contact with Māori, Māori horticulture was exposed to new crop types and economic opportunities to trade fresh produce with passing ships. Potatoes (taewa) became the dominant crop in Māori horticulture, offering a higher caloric yield and tolerance to a wider range of growing conditions than traditional crops. Soon Māori were engaged in international trade, especially with Australia and the United Kingdom, selling flax, timber, non-perishable food, and other goods.

4.2 Evolution of horticulture in New Zealand

During the European settlement period, New Zealand had a relatively low population density when compared to international standards. Therefore, the less labour-intensive but land-intensive

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[6] Furey, L. (2006). *Māori gardening: An archaeological perspective*. Department of Conservation. Retrieved from; https://www.doc.govt.nz/globalassets/documents/science-and-technical/sap235.pdf

[7] Knight, C. (2010). *Māori gardening in pre-European NZ*. Envirohistory NZ. Retrieved from;https://envirohistorynz.com/2010/06/07/maori-gardening-in-pre-european-nz/

pastoral farming became the dominant farming industry in New Zealand. Forests were clear-cut, utilising slash and burn and mass felling of trees methods, to clear land for farming operations. As part of this process, New Zealand also developed a significant native timber and log export industry. In recent times, this has evolved into exotic timber plantations.

On a per-hectare basis, horticulture is significantly more lucrative and productive than other forms of farming. However, it is also more labour- and resource-intensive. As the New Zealand economy and population grows there is an ongoing drive to increase the value of production, driven by a transition from low-value products to high-value products. A horticulture example would be the shift from growing apples to kiwifruit to increase the financial returns per hectare. If a pastoral farm or plantation forest is converted into horticulture new jobs are created, more value is added, and the New Zealand economy grows.

This shift to higher-value horticulture does come with some challenges. Labour demand during peak periods of the growing season, for example harvest time, often outstrips domestic labour supply. This has resulted in Recognised Seasonal Employer (RSE) Limited Visa policies, where international workers can come for short periods of time to fill labour shortages.

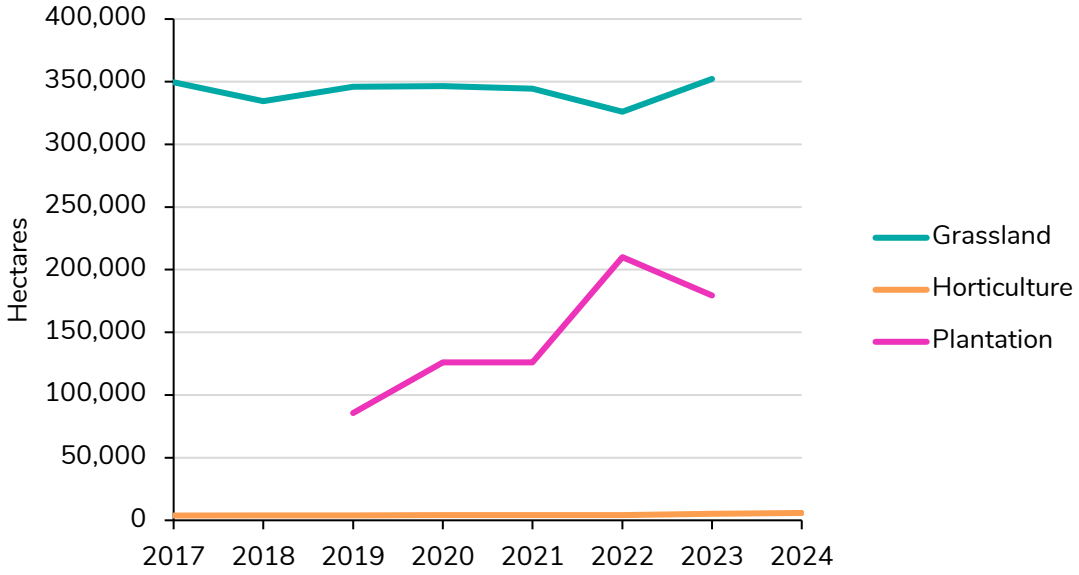
The increasing use of technology in the horticulture industry is set to be a new transition stage for the industry. Picking and processing technology, and increased automation, are improving quickly which may displace traditional methods of harvesting. While technology-heavy jobs tend to create high-value and highly skilled employment, this trend may result in less demand for workers in the horticulture industry overall.

4.3 Horticulture as a share of Māori land

As of 2023, there were 536,700 hectares of Māori farmland engaged in primary production activities, from grassland and plantation to horticulture land.[8] Grassland was the dominant land use with 352,200 hectares used primarily for pastoral farming. This grassland is used as feeding pasture for livestock of which sheep are the most numerous, followed by beef cattle and dairy cattle, for a total livestock count of just over 1.5 million. Horticulture land represents around one percent of the 536,700 hectares at 5,100 hectares.

[8] Plantation includes forest plantings and areas awaiting restocking. It includes exotic forest plantings on farms and separate exotic forestry blocks that are Māori owned.

Figure 2 Māori land by land use (2017-2023)



Source: Stats NZ – BERL analysis

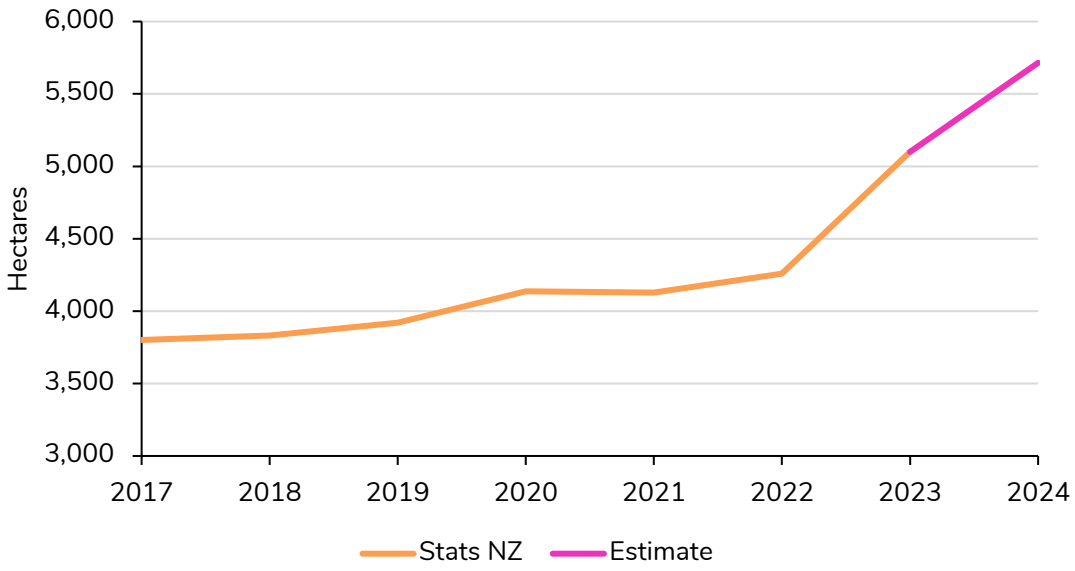
While horticulture currently comprises a small proportion of Māori farmland use (one percent), the Māori horticulture industry is growing and more land is being committed to it. Māori-owned hectares of horticulture farmland saw significant growth between 2017 and 2023, increasing by 34 percent, to reach 5,100 hectares. This expansion is particularly notable given the overall decline in national horticulture land (Table 1 and Table 2).

This growth has been key to increasing Māori participation within New Zealand's horticulture industry. It also presents opportunities for Māori with horticulture often being more high-value (specifically some crops such as kiwifruit) and labour-intensive, requiring and generating more employment. This shift to horticulture offers economic advantages for Māori landowners, generating employment and overall increased land value compared to alternative uses of the land.

Estimating Māori horticulture land in 2024

Stats NZ's latest available data (2023) has Māori horticulture land at 5,100 hectares (orange line in Figure 3).[9]

Figure 3 Māori horticulture land (2017-2024)



Source: BERL analysis

In order to provide an updated estimate for 2024 we reviewed recent reports, news media, programmes, and articles that have been published since March 2024 (the release of the latest available data) in order to identify any new hectares of planted Māori horticulture land.[10] From this, we identified 615 hectares of new Māori horticulture farmland that has been planted during this time, bringing the estimated total of Māori horticulture land to 5,715 hectares in 2024. It is very likely that this is a conservative estimate.

[9] Stats NZ. (2023). *Tatauranga umanga Māori – Statistics on Māori businesses*: 2023. Retrieved from; https://www.stats.govt.nz/information-releases/tatauranga-umanga-maori-statistics-on-maori-businesses-2023-english/

[10] Updated Māori farmland data for 2024 is expected to be released in May 2025.

5 Māori horticulture operations

The importance and value of horticulture operations to Māori have been consistently growing. More and more land is being converted to horticulture crops, providing economic opportunities for Māori individuals, businesses, hapū, and iwi. In 2024, Māori were estimated to own approximately seven percent of New Zealand's fruit and vegetables land, ranging from kiwifruit and apples to onions and avocados.

5.1 Cyclone Gabrielle

In February 2023, the category three tropical Cyclone Gabrielle arrived off the coast of New Zealand causing regional states of emergency. As Cyclone Gabrielle hit the nation, it resulted in devastating high winds, rain, and flooding. The economic and social damage caused by Cyclone Gabrielle was extreme, with an estimated $14.5 billion in damages and 11,000 people internally displaced.[11],[12] These impacts continue to be felt and will be likely to affect those in the horticulture industry for the foreseeable future.

The short-term impacts of the cyclone on the horticulture industry were clear: devastation of the land, income loss, and capital equipment destruction. In the Hawke's Bay region, the most affected by Cyclone Gabrielle, crop loss was estimated to be 35 percent of the harvest. This resulted in loss of revenue for growers, employees, exporters, and auxiliary and support businesses, which all economically depend on good harvest seasons. Vegetable growers were hit extremely hard, contributing to the high food prices seen in late 2023.

Restoring horticulture in Hawke's Bay to how it was before to Cyclone Gabrielle will cost close to one billion dollars, with one estimate putting restoration costs upwards of $920 million in critical response and replanting (like-to-like).[13] These costs extended further, as critical responses such as

[11] Wilson, N., Broadbent, A., & Kerr, J. (2023). *Cyclone Gabrielle by the numbers – A review at six months*. Public Health Communication Centre, University of Otago. Retrieved from; https://www.phcc.org.nz/briefing/cyclone-gabrielle-numbers-review-six-months

[12] Internal Displacement Monitoring Centre. (2024). *New Zealand - Disaster resilience and tailored responses mitigate impact of Cyclone Gabrielle*. Retrieved from; https://www.internal-displacement.org/spotlights/New-Zealand-Disaster-resilience-and-tailored-responses-mitigate-impact-of-Cyclone-Gabrielle/

[13] Boston Consulting Group. (2023). *Hawke's Bay horticultural sector: Economic recovery following Cyclone Gabrielle*. Boston Consulting Group. Retrieved from; https://www.bcg.com/publications/2023/new-zealand-hawkes-bay-horticultural-sector

clearing away silt from trees, prevented normal maintenance tasks that will have to be done at a later stage. Furthermore, fruit trees especially can take decades to become productive. It is reasonable to assume tree loss will result in some growers losing income in the medium-term.

The loss of potential revenue and incomes due to the cyclone will be likely to supress investment by many horticulturalists. As they have to redirect capital reserves into restoring and maintaining their operations, there will be less capital available for investment at this stage.

Not all the effects of Cyclone Gabrielle are necessarily negative for the horticulture industry. The opportunity from such extreme crop and capital destruction is that the sector can look at their operations and decide to shift production focus, replace legacy assets, and build in resilience to prevent future disasters. Insurance payments, while unlikely to fully compensate for the lost revenue, will provide capital for rebuilding the industry, which may be necessary to increase production in the future.

Māori horticulture operations were likely to have been hit harder than the general horticulture industry. The recent influx of Māori horticulture operations probably meant that many trees were young and vulnerable to extreme weather events. In addition, the often-documented challenges for Māori business finance will make post-cyclone recovery more difficult for Māori enterprises without significant capital reserves. The Cyclone Gabrielle impacts will be likely to result in lower horticulture revenue and employment in the short-term.

5.2 Challenges from the COVID-19 pandemic

The COVID-19 pandemic, and subsequent government actions aimed at minimising its effects, was significant for the horticulture industry. While the government worked closely with the sector, challenges in the form of labour shortages, changing regulations, business uncertainty, and difficulty getting products to market resulted in loss of revenue for some operations. Into 2024, impacts of COVID-19 had largely dissipated with the last holdover supply chain constraints and shipping costs being close to being resolved.

Māori horticultural operations faced a difficult time during the pandemic. As many were relatively new operations the business uncertainty probably delayed major investments, requiring these investments to be made at a later date. As many types of horticulture have a long lead-in time before production starts, this will be likely to decrease the profitability of some Māori operations into the future.

5.3 Estimation of Māori horticulture production

In 2024, we estimated that approximately seven percent of total fruit and vegetables land in New Zealand was Māori-owned (5,715 hectares).[14] This includes the operations of Māori individuals, organisations, authorities, and iwi. This is an increase from an estimated five percent of horticulture land in 2020. Table 3 presents Māori horticulture land by different horticulture products in 2024.

Table 3 Estimate of Māori horticulture land (2024)

Product	Total hectares	Māori hectares	Māori share (%)
Apples	10,188	212	2
Kiwifruit	16,992	2,073	12
Avocados	7,270	366	5
Citrus	1,687	79	5
Nuts	1,064	30	3
Onion	4,564	477	10
Squash	3,469	206	6
Potatoes	6,861	17	0
Other horticulture	24,803	2,255	9
Total horticulture	**76,898**	**5,715**	**7**

Source: BERL analysis and United Fresh and Plant & Food Research

The largest horticulture industry for New Zealand, and where Māori are most strongly represented, is kiwifruit. Māori own 12.2 percent of kiwifruit land in New Zealand, with close to 2,100 hectares. It is also the most prevalent land use for Māori horticulture farmers (36 percent of Māori horticulture land). The Māori share of kiwifruit land has increased from just over nine percent in 2019 to 12.2 percent in 2024.

Māori also account for a sizeable proportion, 10.5 percent, of onion land ownership in New Zealand, up from 8.3 percent in 2019. However, this only equates to 477 hectares due to the much smaller scale of onion growing across the nation.

Employment directly created by Māori kiwifruit growers

Horticulture, in general, is a labour-intensive industry, specifically for pickers, pruners, etc. For example, in the kiwifruit industry, estimates suggest that one full-time equivalent (FTE) worker is required for every two hectares of kiwifruit. This varies based on the type of kiwifruit, with green

[14] Our approach to creating a 2024 estimate is outlined in Appendix A.

kiwifruit requiring 0.52 FTEs per hectare and gold kiwifruit requiring 0.63 FTEs per hectare.[15] On this basis, it can be estimated that Māori farmland directly supports at least 1,000 FTEs.

5.3.1 Economic output of Māori horticulture operations

Estimating the gross output of different horticulture crops is difficult due to inconsistency in the reporting of financial performance data. Larger industries, such as kiwifruit, provide comprehensive and up-to-date information on revenue generated from different varieties. While in other industries, such as avocados, citrus, or potatoes, available data is more limited. Our methodology and data sources used to estimate the gross output of the different horticulture crops are provided in Appendix A.

Horticultural land provides a valuable opportunity to generate revenue for landowners and businesses. Certain crops are more valuable than others, while some yield greater quantities per hectare. In a large part, market demand, both domestic and international, and the export potential of crops are key influencing factors. For example, kiwifruit remains a powerhouse in the horticulture industry due to its strong export success. Per hectare revenue for export-oriented kiwifruit is consistently high. In 2023, the average revenue per hectare of gold kiwifruit (export-oriented) was $146,987, whereas for green kiwifruit (domestic-focused) it was $65,717.[16] In general, exported horticulture crops typically are a more lucrative opportunity.

In 2024, we estimated that gross output from Māori horticulture was $305 million, up from $220.5 million in 2019.[17] Unsurprisingly, kiwifruit land is the main driver of the estimated gross output, with a significantly higher revenue per hectare of $110,250 resulting in gross output of $228.5 million.

The estimated gross output of Māori horticulture operations in onions also grew between 2019 and 2024, increasing from an estimated $10.2 million to $15.3 million.

[15] New Zealand Kiwifruit Growers Incorporated (NZKGI). 2020. *New Zealand Kiwifruit Labour Shortage 2020*. NZKGI. Retrieved from; https://www.nzkgi.org.nz/reports/kiwifruit-labour-shortage-2020

[16] Zespri Group Limited. 2024. *Zespri Annual Report 2023/24*. Zespri Group Limited. Retrieved from; https://www.zespri.com/content/dam/zespri/nz/publications/annual-reports/Zespri-Annual-Report-23-24.pdf

[17] Other horticulture represents all remaining horticulture crops, this includes, but is not limited to, pears, stone fruit, berries, feijoas, passionfruit, persimmon, and peas.

Table 4 Estimate of Māori horticulture economic output (2024)[18]

Product	Māori hectares	Revenue per hectare ($)	Gross output ($m)
Apples	212		11.5
Kiwifruit	2,073	110,250	228.5
Avocados	366	10,470	3.8
Citrus	79	11,488	0.9
Nuts	30		
Onion	477	32,111	15.3
Squash	206	6,200	1.3
Potatoes	17	35,200	0.6
Other horticulture	2,255	19,094	43.1
Total horticulture	**5,715**		**305.0**

Source: Tupu, BERL analysis, and United Fresh and Plant & Food Research

It is important to note that the value of horticulture crops can fluctuate from year to year, whether it be from changing consumer preferences or poor weather (including weather disasters). This has been the case for the avocado industry, which has experienced a combination of bad weather and increased competition in the global market (e.g., from Australia). For example, avocados in the 2023/24 season had an official gate return (OGR) per hectare of $10,470, whereas in the 2020/21 season they had an OGR per hectare of $42,090. This has been a key factor in the estimated gross output of Māori avocado land decreasing between 2019 and 2024 (down $1.2 million).

[18] We did not attempt to estimate the gross output of Māori land used for nuts.

6 Employment of Māori in horticulture

This section provides data on Māori and non-Māori employed in the horticulture industry as reported from Census 2023.[19] These numbers represent total employment counts and do not reflect people employed by Māori farmers or businesses.

In total, 3,987 Māori were employed across the horticulture industry in New Zealand. The largest number of Māori were concentrated in kiwifruit growing (933 Māori employees), vegetables (861 Māori employees), and apple and pear growing (609 Māori employees).

Māori were most strongly represented in the citrus fruit growing industry (33 percent of the workforce), followed by kiwifruit growing (23 percent of the workforce).

Table 5 Employment counts by horticulture industry (2023)

Industry (ANZSIC)	Māori	Non-Māori	**Total**	Māori share (%)
Apple and pear growing	609	2,826	**3,435**	18
Nursery production	525	3,060	**3,585**	15
Flowers	69	642	**711**	10
Mushrooms	36	453	**489**	7
Vegetables	861	4,134	**4,995**	17
Grape growing	309	2,880	**3,189**	10
Kiwifruit growing	933	3,072	**4,005**	23
Berry fruit growing	201	885	**1,086**	19
Stone fruit growing	72	591	**663**	11
Citrus fruit growing	81	168	**249**	33
Olive growing	12	147	**159**	8
Other fruit and tree nut growing	279	1,098	**1,377**	20
Total	**3,987**	**19,956**	**23,943**	**17**

Source: Stats NZ – Census 2023 and United Fresh and Plant & Food Research

As avocados are a relatively new industry in Australia and New Zealand, previously being mostly grown in the Americas, they are included in the 'other fruit and tree nut' growing industry. In 2023, avocados represented 77 percent of the land area in this category with the next highest, walnuts, having five percent of the land area.

[19] Industry categories differ from those used throughout the report as Stats NZ collected information based on the Australian New Zealand Standard Industrial Classification (ANZSIC).

6.1 Regional picture

Horticulture activity is highly dependent on climate, soil, and land geography. This results in most crops being isolated to a few geographic areas. The overwhelming majority of kiwifruit is grown in the Bay of Plenty, with increasing rates of smaller developments in the upper North Island and the Nelson-Tasman regions. New Zealand's apples are nearly exclusively grown in the Hawke's Bay and the Nelson-Tasman region. Avocado orchards are located in similar quantities in Northland and the Bay of Plenty.

Due to the geographical concentration of horticulture activities in certain regions, the employment arising from these industries tends to be concentrated and spread across New Zealand relative to the land used for growing.

6.2 Skill levels

The Australia and New Zealand Standard Classification of Occupations (ANZSCO) provides a skill-based classification for all occupations and jobs, classifying them from one (high skill) to five (low skill). Skill levels are determined by the range and complexity of tasks required for each occupation. Generally, skill level five indicates an entry-level occupation, with no relevant prior work experience or training required.

We note that although certain occupations may be classified as low skill, this might not necessarily reflect the actual "skill" required for the occupation. Each occupation in its own right requires a level of skill to complete. Often the horticulture industry is associated with "unskilled" labour due to low barriers to entry but, to be productive, these roles require a high level of skill.[20]

In 2023, 71 percent of employed Māori in the horticulture industry were in low-skill occupations, compared to 49 percent of employed non-Māori. Furthermore, while 43 percent of employed non-Māori in horticulture were in high-skill occupations, only 24 percent of Māori were.

[20] Hort NZ. 2021. *Horticulture Workforce Transition Plan 2021-2031*. Horticulture New Zealand. Retrieved from; https://www.treasury.govt.nz/sites/default/files/2024-05/pc-inq-is-dr-147-nz-apples-and-pears-incorporated-horticulture-new-zealand-incoporated-attachment-2.pdf

Table 6 Skill level of Māori and non-Māori employed in horticulture (2023)

Skill level	Share of horticulture workforce (%)	
	Māori	Non-Māori
High-skilled	24	43
Skilled	5	8
Low-skilled	71	49

Source: Stats NZ – Census 2023

Low-skilled occupations in horticulture largely represent more hands-on workers, typically responsible for ongoing orchard processes such as maintenance and tending to or picking trees and vines. Although these occupations may be interpreted as "low-skill" due to generally low barriers of entry, "to be 'productive' in these roles requires a high level of skill."[21]

Often picking and pruning positions have strong seasonal requirements. Labour demand peaks during the thinning, pruning, and harvesting periods, as these activities are predominantly done by hand and require a labour-intensive, capable workforce. For example, the 2023 New Zealand Kiwifruit Growers Incorporated (NZKGI) seasonal labour report stated that 55 percent of kiwifruit workers were New Zealanders, 23 percent were part of the Recognised Seasonal Employer (RSE) scheme, and 18 percent were on a working holiday visa.

The RSE Limited Visa is a temporary work visa for New Zealand's horticulture and viticulture industries and acts as the main pathway for plugging labour shortages. In 2024, the total quota for RSE workers increased by 1,250 workers to a total of 20,750 workers. While there is an argument to be made that the RSE scheme disincentivises investment into New Zealand's workforce, it undoubtedly fills a labour gap.

There is continued investment and development in automation and augmentation innovation to advance productivity and skill within the horticulture workforce. This also has implications for the seasonality of the workforce, fostering more permanent roles. Ultimately, this is more likely to lead to a lower reliance on migrant labour where vulnerabilities were revealed during COVID-19, when RSE workers were unable to enter New Zealand.

[21] Ibid.

7 Māori horticultural aspirations

As horticulture presents significant benefits in terms of economic development, a number of Māori entities intend to develop pastoral land into horticulture. Over the past and next decade, Māori entities are investing heavily in growing Māori involvement in berry, kiwifruit, and avocado crops.

Table 7 displays the number of provincial growth fund (PGF) projects that involved tangata whenua and horticulture. It indicates the increasing involvement of Māori in horticulture with over 753 hectares receiving funding for horticulture development. This is a mix of completed and contracted projects.

Table 7 Approved horticulture PGF projects for tangata whenua

Product	Hectares	Organisation
Apples	10	Ngāti Pāhauwera Commercial Development Limited
Kiwifruit	69	Te Whānau a Maruhaeremuri Hapū Trust
Avocados	20	Renaissance Group Ltd
Citrus	18	Te Rimu Trust
Nuts	20	Te Whānau a Maruhaeremuri Hapū Trust
Other horticulture	616	
Total	**753**	

Source: Kānoa managed projects list (PGF)

7.1.1 Kiwifruit development

As of 2022, 76.6 percent of New Zealand kiwifruit land is in the Bay of Plenty, with the next largest producing region being Auckland with 4.9 percent of kiwifruit land. Previously, as reported in 2020, Northland had the second highest land share of kiwifruit. This is now not the case, with the Waikato, Auckland, and Gisborne regions all having more land dedicated to kiwifruit than Northland. This is an indication of the changing location of key kiwifruit-growing regions in New Zealand.

Over the coming decade, the industry is set for another large-scale expansion. Zespri, responsible for exporting kiwifruit internationally, is aiming to increase the value of kiwifruit exports to over $4.5 billion dollars by 2025. In Zespri's 2024 annual report, kiwifruit sales had reached $3.3 billion, edging closer to their goal.

7.1.2 Avocado development

The future for avocados as a component of Māori horticulture is very promising. The PGF supported one major avocado development project; Renaissance Group Ltd was supported to develop a 20-

hectare avocado orchard in Northland to accelerate Māori economic aspirations.[22] Te Uri o Hau is also developing an avocado orchard, with a 27-hectare orchard being developed on the West Coast of Northland.[23] Avocado development in Northland may be limited by water access, with each avocado needing a minimum of 40-50 inches of rainfall a year. Irrigation is an option, however, due to the Aupouri aquifer being below sea level and in sandy ground, there is a possibility that salt water may leach into the aquifer if too much fresh water is taken. Limiting access to water takes in the future may limit growth, although this may be remedied through increased investment in water storage as an alternative to taking from the aquifer.

[22] Kānoa – Regional Economic Development & Investment Unit (Kānoa – RDU). 2024. *North Island Weather Events Response*. Kānoa. Retrieved from; https://www.kanoa.govt.nz/north-island-weather-events-response

[23] Harawira, T. 2023. *Te Uri o Hau dives into avocado market*. Māori Television Service. Retrieved from; https://www.maoritelevision.com/news/regional/te-uri-o-hau-dives-avocado-market

8 Looking ahead

The future of Māori participation in New Zealand's horticulture industry is growing and is full of potential. As we look ahead, the sector will continue to grow and evolve, driven by the increasing involvement of Māori entities and the strategic transition of land to horticultural use. The consistent growth in Māori horticulture land since 2006 and the significant contributions to the industry, such as the $350 million gross output on Māori horticulture farms and the employment of nearly 4,000 Māori workers in the industry, highlight the vital role that Māori play in this sector.

Furthermore, the ongoing drive to transition suitable land to horticulture presents significant opportunities for economic growth and development within Māori communities. By leveraging the high value of horticultural land, compared to more traditional agricultural uses, Māori entities can create new revenue streams and employment opportunities, contributing to the overall well-being and prosperity of their communities.

Appendix A Data sources and methodology

While data on the national horticulture industry in New Zealand is readily and publicly available, as well as being of high quality, data and statistics specifically on Māori involvement are more limited and are dispersed across sources.

The following appendix presents the range of data sources that were accessed and utilised in this report. We describe the source of the information, type of data, and limitations.

Sources

Industry data

Stats NZ conducts an annual Agricultural Production Survey and every five years conducts the Agricultural Production Census. Both surveys serve as the primary basis for horticulture statistics in New Zealand.

For the purposes of this report, the Agricultural Production Survey completed in 2022 was the primary source of aggregate industry data used. These statistics included land use, production volumes, and export values of horticultural products. Fresh Facts, an annual series of reports produced in partnership by United Fresh New Zealand Incorporated and Plant & Food Research New Zealand, has also been used to provide additional information where appropriate.

Estimating horticulture crops' gross output

The following section provides the sources and methodology used to estimate the gross output created from Māori horticulture land presented in Table 4. We present this for each crop individually. Where possible, we have maintained consistent data sources across crops, specifically relying on Fresh Facts when relevant data is available.

It is important to note that the availability of horticulture data varies significantly by crop, as well as the latest available years. We have used the latest available data when possible.

Apples

Since 2019, there has been no publicly available data on average apple orchard OGR.

Kiwifruit

The average revenue per hectare for kiwifruit was derived from Fresh Facts which publishes the OGR per hectare (000) for Zespri kiwifruit.

- In 2023/24, OGR per hectare of Zespri kiwifruit was $110,250.

Avocados

The average revenue per hectare was derived from Fresh Facts which publishes the OGR per hectare (000) for avocados.

- In 2023/24, the OGR per hectare (000) of avocados was $10,470.

Citrus

To determine the average revenue per hectare for citrus horticulture products, we averaged the revenue per hectare of lemon, navel orange, Valencia orange, and mandarin as sourced from Tupu.[24]

Onions

The average revenue per hectare for onions was derived from Fresh Facts which published the OGR per hectare for onions up until 2021/22.

- In 2021/22, the OGR per hectare of onions was $32,111.

Squash

The average income per hectare for squash was derived from TUPU which published the income per hectare as estimated by AgFirst.[25]

- Income per hectare for a 12-tonne crop was around $6,200.

Potatoes

In order to obtain an estimate of revenue per hectare for potato farms in New Zealand, we derived the midpoint from data available from TUPU which indicated that the revenue per hectare ranged between $25,600 and $44,800.[26]

- Revenue per hectare of potatoes was $35,200.

[24] Tupu.nz. (2024). *Land Use Fact Sheet – Citrus*. Retrieved from; https://www.tupu.nz/en/fact-sheets/citrus/

[25] Tupu.nz. (2024). *Land Use Fact Sheet – Squash*. Retrieved from;https://www.tupu.nz/en/fact-sheets/squash/

[26] Tupu.nz. (2024). *Land Use Fact Sheet – Potatoes*. Retrieved from;https://www.tupu.nz/en/fact-sheets/potatoes/

Other horticulture

To obtain an estimate of the revenue per hectare of the broad other horticulture grouping, we took an average of the above derived revenue per hectare of avocados, citrus, onion, squash, and potatoes. It is likely this would be a conservative estimate.

- Revenue per hectare of 'other horticulture' was $19,094.