

Branching Out Blueprint

Avocados

THE OPPORTUNITY FOR TARANAKI, NEW ZEALAND



venture
TARANAKI
Te Puna Umanga

A blueprint for the future of food and fibre

Branching Out is a project that has been initiated and led by Venture Taranaki. It is underpinned by funding from the Ministry for Primary Industries' Sustainable Food and Fibre Futures fund (SFFF). It is supported by local sponsors as well as the region's three district councils – New Plymouth District Council, South Taranaki District Council and Stratford District Council. The project has identified a number of innovative, commercially viable food and fibre value chain opportunities for Taranaki. This work supports the region's strategy and long-term vision for a resilient, high-value, and low-emissions economy built on inclusivity and sustainability, as articulated by Tapae Roa and Taranaki 2050 – the guiding strategic documents for the region, co-created with the people of Taranaki.

Branching Out aims to strengthen and diversify the Taranaki economy and has taken input from a wide range of industry participants, from landowners to interested growers, manufacturers to food & fibre entrepreneurs and potential investors. Through a process of investigation, a shortlist of eleven feasible ventures have been selected. Crown Research Institutes and universities, including Massey and Lincoln, were engaged to provide robust research that underpins each venture selection. Work has also been undertaken with commercial partners to support the development of prototypes with significant market potential, and a core focus on sustainability and waste reduction.

The investigations, collaborations, and potential commercial pilot opportunities for the region that have been explored as part of this project are being presented

as Venture Blueprints. These blueprints aim to build investor confidence and serve as an informative and inspirational roadmap to kick-start complementary land-based activities and associated value chain enterprises in Taranaki.

The blueprints focus on traditional methods of assessing value, determined by comparing inputs (land, animals, machinery, time) and outputs (milk, meat, wool, other products). However, consumer expectations and an increased awareness of environmental degradation mean that thought should also be given to how the natural environment can be protected and what value this action can add to a developing sector.

TE TAIAO

In 2020, the Primary Sector Council released their Food and Fibre Strategy, Fit for a Better World. This strategy adopted the Te Taiao framework, acknowledging that Te Taiao is all of the natural world that contains and surrounds us (land, water, air, and biological life). It is a uniquely New Zealand perspective that is underpinned by three guiding principles:

- Our land, water, air, and biological life must be able to thrive without over-use
- Any use is a privilege, not a right
- If something is not healthy or well, we must fix it.

Developing or participating in a new value chain is an opportunity to consider your business's relationship with Te Taiao. It is a chance to farm, produce and engage in a way that safeguards the mana and integrity of the natural world. If the whenua (land), and the entities that are connected to it, are to be nourished and thrive, then it must be cared for and protected. Each blueprint opportunity should be considered with Te Taiao in mind.

DISCLAIMER

This document, produced by Venture Taranaki, provides an overview of opportunity for commercial production and processing of avocados in Taranaki, and an indication of potential returns. It does not constitute investment advice. Professional advice should be sought if you wish to explore this opportunity further. This blueprint is correct to our knowledge and based on the best information we could access as of June 2022. However, this work is ongoing, and we welcome new or emerging information about this opportunity. For more information or for input, please contact branchingout@venture.org.nz.

How to reference: Venture Taranaki – Branching Out, *Avocados: The opportunity for Taranaki*, June 2022



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Avocados: A snapshot

UNTAPPED POTENTIAL

- Avocado is a profitable, rapidly growing export-oriented industry with New Zealand the ninth largest avocado exporter, yet producing just 2% of the international supply.
- As global per capita avocado consumption continues to increase, fueled by positive perceptions of the trendy superfood, the currently strong demand for New Zealand-grown avocados is expected to continue. This is likely to further be aided by the industry's focus on growth in Asian markets supported by free trade deals such as the New Zealand and South Korea free trade agreement.
- As the industry looks to regional diversification to meet this demand, increasingly favourable climatic conditions, land availability and an entrepreneurial mindset means there is growing interest in expanding on the existing productive orchards in Taranaki.
- Beyond the high value fruit, opportunities will arise for support services, post-harvest infrastructure and processing facilities for value-added products. The region is well positioned to capitalise on this development, transferring skills and knowledge to the industry and building on the existing leadership in food and product development.

WHY NOW?

- There is strong and growing demand for New Zealand avocados.
- There is increasing demand for avocado from customers in Asia.
- Avocados are a viable complement to dairy. Prices for land suitable for avocado development in Taranaki are low compared to land in established avocado growing regions.
- Avocados are already grown in Taranaki and new plantings are underway or planned. This level of existing and planned development is enabling better access to supporting services.
- Support services including nurseries and packhouses are encouraging regional diversification to meet demand and spread risks from climatic events and pest or disease outbreaks.
- There is growing demand for value-added products that can be produced from avocado.

SECTOR TURNOVER:

Sales of NZ grown avocados: \$234m in 2020/21 - \$171m in exports and \$63m from the local market.

SECTOR SIZE:

8.2m trays of avocados were harvested with 5m trays exported, including 4.5m to Australia.

GROWTH TARGETS:

New Zealand Avocado is targeting \$1b in sales of New Zealand avocado by 2040.

WHY TARANAKI?



Growing conditions: Mild climate with fertile soils provides locations with conditions that appear suitable for avocado.



Land price: Suitable land in Taranaki is cheaper than in the main growing region of the Bay of Plenty.



Climate: Cooler climate provides a slightly different season to warmer growing regions such as Northland and Bay of Plenty. This may provide benefits in terms of delivering fruit to markets and in utilising required resources for orchard and post-harvest management.



Experience: There are existing productive avocado orchards in Taranaki – knowledge and experience from local growers may be accessed.



Existing capabilities: The food production and processing sectors are well established in Taranaki with capabilities and experiences that can be applied to avocado.

WHO SHOULD BE INTERESTED?



Taranaki farmers looking to expand and diversify their income stream.



Growers from other regions looking to reduce weather-related risk and to take advantage of lower land costs compared with traditional growing areas.



Investors seeking an attractive return in a growth industry.



Packhouse and post-harvest operators wanting more fruit and/or to spread their flow of fruit over a longer season.



Other service providers, such as food producers, wanting to grow their businesses or develop new products.

IN-REGION INFRASTRUCTURE OPPORTUNITIES

In addition to the establishment of orchards there are opportunities for regional support services, post-harvest infrastructure and processing facilities to create value-added products.

VALUE-ADDED OPPORTUNITIES

Roughly 10% of New Zealand's current annual avocado crop is considered process grade – too small or blemished to be sold as fruit. This provides significant opportunity for production of high value cosmetic, health supplement and nutraceutical, food, and even packaging products, largely from waste, that capitalise on the fruit's widely promoted and accepted health benefits.

RISKS AND SENSITIVITIES

- Taranaki is windier than most other regions where avocado are currently grown at scale. Shelter will be needed but is readily available with well-established methods.
- Avocado yields can fluctuate significantly from year to year leading to variable supply and pricing. As with any business, the avocado industry will see economic peaks and troughs over time.
- The cooler (and more marginal) climate in Taranaki for avocados could impact on yields in some years.
- Given the water footprint of avocado and the likely [less predictable rainfall patterns across New Zealand in the future](#), access and allocation of water is an important consideration.
- Increased production in other countries may compete with New Zealand production.
- There is heavy reliance on Australia as the dominant export market (currently 90% of exports).
- Competition amongst New Zealand exporters is driving prices down.
- Early entrants in Taranaki may experience challenges accessing supporting services and inputs locally. A range of goods and skilled services required to develop and run orchards may need to be sourced from other regions.
- Fruit will initially need to be sent out of the region for packing and processing.
- Biosecurity breaches can bring pests and/or diseases to New Zealand, should this occur the industry could suffer significant losses.

FARM FINANCIALS¹

Minimum viable land: 4 hectares

Initial Capital Investment for growers: \$49,750 per hectare

Orchard Gate Returns 2020: \$50,460 per hectare

Estimated time to 100% yield: 10 years

Time to Cash Positive: 10 years

POTENTIAL RETURNS FROM ONE SCENARIO OF AVOCADO GROWING IN TARANAKI

According to the financial model developed for Venture Taranaki by The Agribusiness Group, 100ha of avocado orchard in Taranaki would:

- Produce annual revenue of just over \$5m.
- Provide an annual cash operating surplus of just over \$2.3m.
- Employ around 25 FTE.

TARANAKI BRANCHING OUT SCORECARD

Opportunity rating
1 = low, 5 = high.

This scorecard is intended to act as a quick comparison between blueprint opportunities. These scores are subjective and based on information available at the time of publishing. Further professional investment advice should still be sought.

Development Opportunity

Suitable growing conditions	4
Suitable land available at reasonable cost	4
Existing investment interest – orchards in the region and new ones being developed	4
Local development experience	3
Potential for circular economy opportunities	3
Established local, domestic, and international demand	4

Product Opportunity

Growing demand for New Zealand avocados, especially in export markets	3-4
New Zealand avocados differentiated in the market	2-3
Contribution to health and wellness of the consumer	5
Established sustainable/regenerative growing practices, including water usage	2
Reduced greenhouse gas emissions compared to existing land uses	4

Postharvest and Processing Opportunity

Postharvest and processing facilities available now in Taranaki	1
Opportunities for development of value-added products, particularly from waste products	5

¹ Based on a financial model provided by The Agribusiness Group.

New Zealand's avocado industry

Avocado is an important horticultural crop in New Zealand – surpassed in scale only by production of kiwifruit, apples and grapes.

Around 1,600 growers cultivate just over 4,000 hectares of avocados (an average of 2.5ha/orchard). There is a large proportion of small owner-operated orchards (less than 2.5ha) and a relatively small number of larger orchards (20ha+) which require additional staff.

The avocado industry is continuing to expand in terms of area planted, tonnes of fruit produced and total revenue. 170 new orchards were registered with Avocado New Zealand during the 2020/21 season including an increasing number of larger professionally managed orchards.

There are commercial avocado orchards established in other regions with suitable growing conditions. Several orchards have been established in Taranaki over the past 20 years including a [new development on a 30ha property at Brixton](#).

According to New Zealand Avocado's [2021 Annual Report](#):

- Total sales of New Zealand grown avocados were \$234m in 2020/21. This compared to \$167m of total sales in 2019/2020.
- Export sales were \$171m compared to \$101m in 2019/20.

- Domestic market sales were \$63m - up from \$54m in 2019/20.
- 8.2m (5.5kg) trays were harvested in 2020/21 – a total of 45,000 tonnes of avocados.
- 5m trays were exported, including 4.5m to Australia, with the balance going to several Asian markets.

Exports are driving overall growth – but domestic sales remain an important part of the industry. All unprocessed avocados consumed in New Zealand are grown in New Zealand as raw avocados cannot be imported due to biosecurity risks.

Avocado sales to Australia in 2020/21 were up 45% on the previous year. This was partly a result of Australian avocados being in short supply – particularly from Western Australia.

Yields of avocados from regions typically go up and down usually in a biannual cycle. A year of poor yields and short supply is typically followed by a year of plentiful supply. New Zealand Avocado's 2020/21 Annual Report (p12) notes that Australian volumes expected in the 2021/22 season are three times those of the 2020/21 season.

Allied with strong production in New Zealand and difficulties getting fruit from New Zealand to some export markets, this is expected to [place pressures on the New Zealand industry](#) and may lead to a drop in returns to growers in the 2021/22 season.

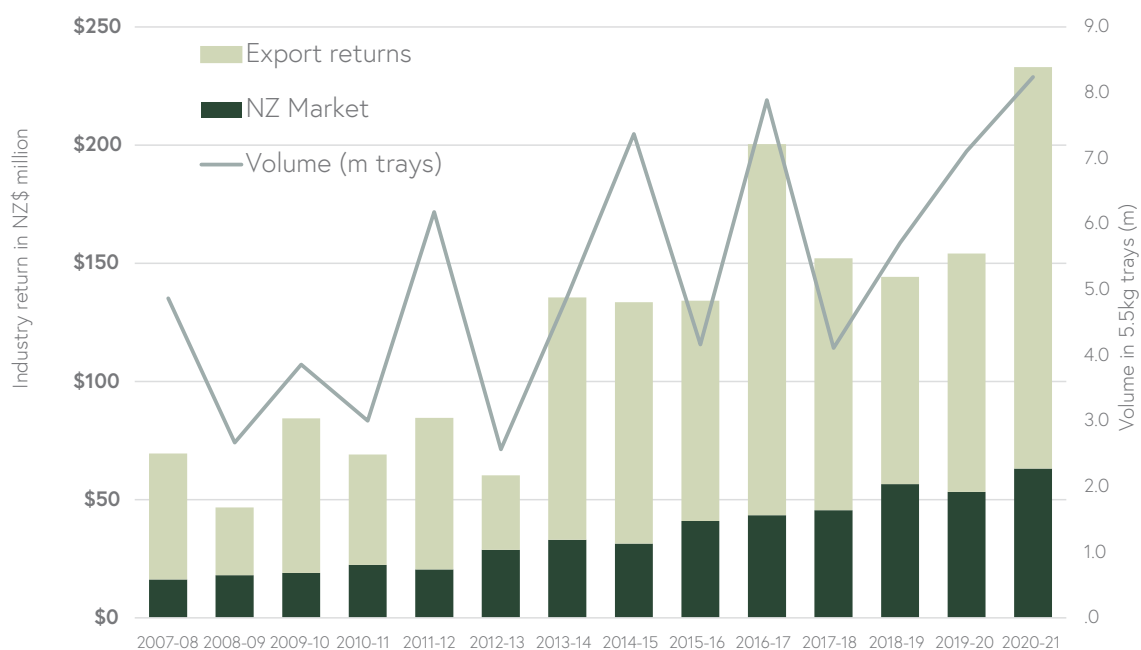


The chart below² shows the upward trend in total sales of New Zealand avocados since 2007/08, and also illustrates the irregular yields. Improved management techniques appear to have helped smooth production flows over the past four years. Smoothing out the flow of fruit is an opportunity for the industry that may be helped by spreading avocado production into new regions.

Despite the current season's challenges, further growth of the New Zealand avocado industry is expected –

largely driven by export demand. New Zealand avocados are positioned as a premium product in international markets supported by the perception of New Zealand as a producer of clean and healthy food.

The increasing (but fluctuating) returns from avocados is shown by the data on orchard gate returns (or OGR³) summarised in New Zealand Avocado's 2020/21 Annual Report (p28):



NATIONAL ORCHARD GATE RETURN

Year	Industry orchard gate return	Average orchard Orchard gate return/ha	Excellent grower 25 tonnes/ha Orchard gate return/ha	Total hectares
2020-21	\$174.5m	\$42,091	\$96,266	4,145
2019-20	\$101.3m	\$22,728	\$64,815	3,937
2018-19	\$107.0m	\$28,208	\$85,165	3,795
2017-18	\$120.8m	\$31,479	\$133,620	3,839
2016-17	\$147.3m	\$38,886	\$84,883	3,787
2015-16	\$92.8m	\$24,757	\$101,270	3,748
2014-15	\$87.0m	\$24,807	\$55,684	3,511
2013-14	\$75.9m	\$20,721	\$70,417	3,661
2012-13	\$20.3m	\$4,868	\$36,009	4,179
2011-12	\$36.9m	\$8,679	\$27,104	4,247
2010-11	\$43.7m	\$9,317	\$49,151	3,524

² From "The New Zealand Avocado Industry"

³ OGR (Orchard Gate Returns) refers to the income an avocado grower receives tray of fruit.

The short-term industry target is \$280m of total sales by 2023. The industry vision is to have 10,000ha in production by 2040 and total sales of one billion dollars.

Revenue growth in the avocado industry is being driven by the combination of increased plantings, improved yields and from sales of value-added products such as avocado oil.

In 2020, New Zealand Avocado suggested 10,000ha of new avocado orchards were being planted and likely to begin production in the next 2-5 years. Many of the new avocado orchards are conversions from dairying, particularly in [Northland](#).

While there are many varieties of avocado, almost all New Zealand production is from the Hass variety. It is the only variety that is approved for export from New Zealand. The opportunities for other varieties to be more widely grown are being explored – including their role in smoothing out fluctuations in yield. It is possible export approval may also be gained for other varieties.

To meet the increasing demand for avocados more growers are needed in suitable locations such as Taranaki.

As raw avocado can't be imported, New Zealand avocado growers face no direct competition in the local market – other than from each other. Processed avocado product can be imported and provides competition for local product (e.g. most guacamole products on New Zealand supermarket shelves are imported).

There is of course indirect competition from other fruits and foods – but avocado has a distinct profile in the market (as a nutrient rich fruit containing fats, proteins and carbohydrates) providing some protection from competition.

Similarly, only Australian and New Zealand avocados can be sold in Australia. Competition in that market is limited to Australian-grown avocado. Growers from other countries want to access the Australian market. New Zealand Avocado recently [noted](#):

"We also face the challenge that Chile is very keen to export their avocados to Australia, a market that until now has only imported avocados from New Zealand. Australia is one of the highest paying markets in the

world for avocados, which has resulted from decades of concerted effort to grow consumption by New Zealand avocado growers and exporters, and their Australian counterparts. The value in the Australian market makes it very attractive for the large Central and South American avocado producers, and Chile's season is very close to New Zealand's so would be a direct competitor in the Australian market. Add to that the new plantings in Western Australia, also harvesting in the New Zealand season, and we need to all recognize that if our avocados are not the best on offer, customers and consumers will look elsewhere."

While growth in exports is expected, New Zealand avocado growers face competition in other international markets from existing and much larger producers. New Zealand Avocado Growers Association Chair Linda Flegg [noted](#):

"Further developing markets for avocados from New Zealand will remain a priority in 2021, with Australian domestic supply forecast to increase considerably this year and over the coming five years. Demand for avocados continues to increase in markets across Asia, the key challenge will be meeting export plans and delivering premium quality New Zealand avocados to these markets during a time of continued disruption to global freight and logistics."

As noted above, there are forecasts that demand for New Zealand avocados will increase more than four-fold to nearly \$1 billion by 2040. While this is a significant increase it will remain a relatively small proportion of global production. There is room for further and/or quicker growth in production.

While local sales are still increasing it is expected the majority of the increased future production volumes will be exported.

According to [New Zealand Avocado](#) around 90% of New Zealand grown avocado are currently sold as fresh fruit (60-65% exported and about 25-30% sold in New Zealand).

The other 10% or so of New Zealand grown avocado is sold for value-added product processing.

To meet the increasing demand for avocados more growers are needed in suitable locations such as Taranaki.

Drivers of growth



Main avocado regions and the opportunity for Taranaki

While the current season may be challenging there appears to be clear demand for further production of New Zealand avocados.

Production of New Zealand avocados is concentrated in the Bay of Plenty (54%) and Northland (36%) regions.

There is relatively limited availability of land suitable for avocados in the main growing region (Bay of Plenty), and strong competition for that land from kiwifruit growers. The majority of new avocado orchards have been developed in Northland,⁴ particularly on land converted from dairying.

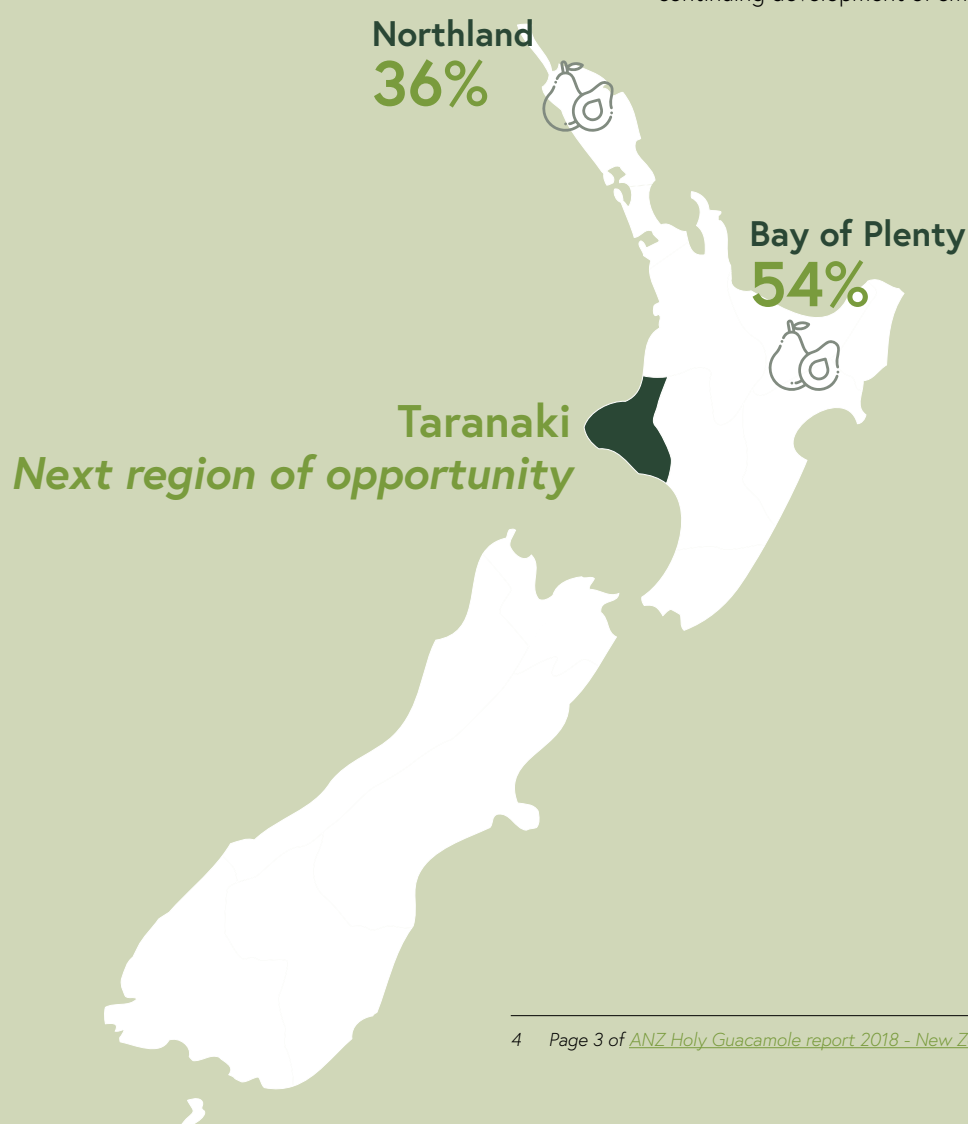
To meet the expected demand for New Zealand avocados there is opportunity for development of new orchards in regions such as Taranaki that have a suitably mild climate and good soils.

Climate change is likely to make the Taranaki climate even more suitable for avocado production over coming decades.

Avocados have been grown commercially in Taranaki over the past 20 or so years. There are several small orchards in northern Taranaki. Taranaki's first larger-scale orchard is currently under development on a 30-hectare property at Brixton. This [\\$5m development by Matt Hareb](#) involves 4,500 avocado trees being planted this year on an initial 10ha and another 4,500 expected to be planted next year.

Several thousand [more avocado trees](#) have been ordered to be planted in other local orchards in 2021 and 2022.

There is opportunity to develop more larger-scale orchards in the region similar to the Brixton development as well as continuing development of smaller blocks.



The avocado industry supply chain

Setting up and operating an avocado orchard requires a range of supporting services.

Relationships will need to be established with:

- Horticultural advisors and consultants to assess opportunities and advise on orchard establishment and operations
- Financial advisors to support and/or package development projects
- Nurseries to provide plant-stock – both avocados and shelter
- Contractors to help establish orchards
- Contractors to help with orchard management
- Pickers
- Apiarists to provide bees for pollination
- Rural sector retailers to provide the equipment and supplies needed for orchard operation
- Transport companies to move fruit from Taranaki
- Packhouses to sort and pack fruit for export.

There is also an opportunity to build relationships with existing avocado processors in other regions.

It is likely that some of these supply chain services will initially be provided from other regions. As the local avocado industry develops it can be expected that a wider range of supply chain activities will be provided in Taranaki. These supply chain opportunities provide further opportunity for investment in Taranaki.

Some of these supply chain activities may complement opportunities provided by the development of other horticultural crops in Taranaki, such as kiwifruit, which are also being encouraged by the Branching Out project. For example, a packhouse may be developed servicing avocado and kiwifruit growers.

While a small-scale avocado orchard may supply to the New Zealand market, a large-scale avocado orchard will likely carry out export sales. Relationships will need to be developed with registered packers and exporters to provide export standard avocados.

New Zealand Avocado provides a [directory](#) of industry supply chain providers including consultants, nurseries, pollination and bee series, AvoGreen Accredited Operators, registered contract harvesters, spray contractors, registered packers and registered exporters. The current list of providers does not include any Taranaki businesses.

[New Zealand Avocado](#) represents the industry in New Zealand. It is made up of two entities: NZ Avocado Growers Association and New Zealand Avocado Industry Limited.

The NZ Avocado Growers Association [supports avocado grower's interests](#):

"by promoting the sale and consumption of avocados, managing a research and development programme, and by creating a supportive structure that encourages growth and development within the industry."

The Association also:

"co-ordinate and disseminate relevant industry information and lobby and liaise with Government for the good of our growers."

The associated [NZ Avocado Industry Limited](#):

"deal with any contractual arrangements necessary for the management of the industry and under the NZHEA Act 1987, we implement quality standard, export grade standards and rules and procedures that must be followed by growers, pack houses and exporters."

The [packers](#) registered with New Zealand Avocado are listed on their [website](#). They are all based in either Bay of Plenty or Northland. They also have a directory of [registered exporters](#).

While the majority of New Zealand avocado is sold as fresh fruit there is growing interest in processed avocado products. Several companies are well established, providing added-value food and nutraceutical products – please see *Opportunities for Adding Value* Section for examples.

Rewarding returns

The avocado industry is attracting investment and growing because it has provided acceptable ongoing returns from well managed orchards.

As noted previously yields and orchard gate returns can vary significantly from season to season:

- The 2019/20 season had total industry sales⁵ of \$167m and orchard gate returns⁶ averaging \$22,728 per hectare.
- The 2020/21 season had total industry sales of \$227m and orchard gate returns averaging \$42,091 per hectare.

New Zealand Avocado provides advice on potential returns on its "[Becoming an Avocado Grower](#)" page. They note that two distinct management regimes:

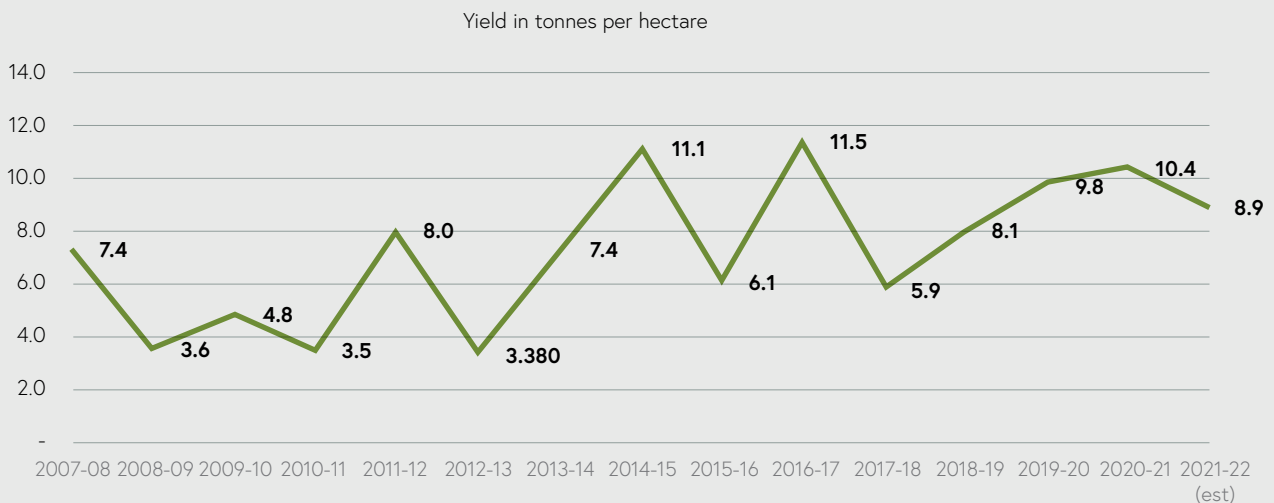
- "When day to day functions such as mowing, pruning, fertiliser application and pest monitoring and spraying are performed by the grower, costs range from around \$10,000 per hectare.
- For orchards that outsource these functions, running costs are up to and can exceed \$30,000 per hectare per annum."

Higher than average yields and OGR are possible from more intensively managed and usually larger orchards – albeit also usually with increased costs. There is a range of new management practices that are being investigated to further improve average yields.

The New Zealand industry has a goal to increase yields to an average of over 12 tonnes per hectare which will be more than has been achieved in any of the last 14 seasons.

While the industry average struggles to get above 12 tonnes/per hectare, many more intensively managed orchards are already regularly achieving well over 12 tonnes per hectare. Many other smaller owner-operated orchards will be well below this figure – but will also have lower cost structures. Returns acceptable to growers are possible from a range of management regimes.

The 2020/21 season had total industry sales of \$227m and orchard gate returns averaging \$42,091 per hectare



⁵ Total industry sales refers to the value of all avocados sold in the market.

⁶ Orchard gate returns refers to the income an avocado grower receives per tray of fruit.



The avocado plant and key varieties

All avocados are varieties of the plant *Persea americana* which originated in central America.

The name avocado is adapted from a native American word "*ahuacatl*".

The avocado contains a disproportionately large seed. There is speculation that this is because it became adapted to being eaten by now-extinct large mammals which ate the fruit and distributed the seed in their droppings (similar to the role kererū plays with seed distribution in New Zealand forests).

The avocado has been cultivated and improved by humans for several thousand years and has become widespread in Central and South America.

The avocado has a distinctive fruiting pattern. The fruit don't ripen properly until they are picked. This means fruit can stay on the tree and be harvested over a long season – sometimes overlapping with the beginning of the following season's growing cycle. This overlap is thought to be an influence on the irregular yields of avocados with the plant's energy resources being put into fruit on the tree reducing the energy applied to the following season.

New Zealand Avocado summarises the [harvest periods](#) for the most frequently planted varieties:

HARVEST PERIODS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Hass												
Reed												
Maluma												
Carmen												

As avocado trees flower in spring, the fruits of one season are often on the tree at the same time as the flowers for the next season.

However, once picked, avocado need to be delivered to market and consumed relatively quickly. This is quite different to most other leading fruits, such as apples and kiwifruit, which can be picked, then placed in cold storage for several months and released in a steady flow to the market. As noted by [New Zealand Avocado](#):

"The tree is our coolstore, and post-harvest needs to be as efficient and fast as possible."

There are more than 500 other named varieties of avocado. They are grouped into three families – Mexican, Guatemalan and West Indian. More than one variety will need to be planted in orchards as avocados fruit best when a different but compatible variety is planted for pollination.



Hass is the most widely planted variety in New Zealand (95% of plantings) and the only variety which can currently be exported. If the goal of a new development is to export avocados, Hass will need to be grown.

The widely planted Hass variety was originally a [plant grown from seed](#) discovered in California in the 1920s (and which survived until 2002). It is a member of the Mexican family of avocados. From the 1970s onwards Hass became the leading variety in California and now accounts for 80% of global avocado sales.

Hass avocados are the familiar ovate shape with a pebbled dark green skin that changes to black when ripe. Hass crops well, produces tasty fruit that is reasonably durable, and has good shelf life.

Hass has Type A blossoms and is most [effectively pollinated](#) by varieties with Type B blossoms. The [classification as Type A or B](#) depends on the time the male and female organs in the flower open and close and is affected by temperature – below 20°C leads to irregular opening and closing times.

There are several Type B [pollinisers available](#) including Zutano, Bacon, Ettinger, Edranol and Fuerte.

Most avocados are grafted onto a seedling rootstock (though more expensive cloned rootstock is also available). New Zealand Avocado [notes](#) that Zutano is the most common source of seed for rootstocks.

Growers also need to consider the issue of rootstock – and whether seedling or clonal rootstocks are used. New Zealand Avocado provides some [information on rootstocks](#) and nurseries will also have information on what rootstocks will be suitable.

If the goal is to target the local market, then other varieties of avocado can be considered such as Reed, Maluma, Carmen and GEM. Some are round or pear-shaped rather than ovate while most don't change colour when ripe. New Zealand Avocado has [information on these varieties](#).

Several other varieties are available in New Zealand and [trials are underway](#) to evaluate their performance and the performance of various rootstocks.

There are also New Zealand developed varieties such as the greenskin varieties (that don't turn black when ripe) developed by Avogrey in Gisborne and marketed by [Riversun](#). There is currently interest in the new Eclipse variety. Eclipse, along with some other new varieties, is controlled via Plant Variety Rights.

Nurseries and existing growers may be able to provide advice on the performance and/or preferred growing conditions of the varieties in Taranaki.

The data available on returns for New Zealand avocados does not distinguish between varieties. Hass is so dominant that the returns from Hass are effectively the same as the returns for the whole industry. This is different to crops such as kiwifruit or apples where there are distinctive yields and returns across a range of varieties.

HEALTH BENEFITS OF THE FRUIT

The health benefits of avocados are widely promoted in order to increase demand and raise prices. New Zealand Avocado [says](#):

"Avocados are a nutrient-dense fruit that plays a major role in healthy diets, contributing almost 20 vitamins, nutrients and phytonutrients. Also, avocados are an excellent source of healthy monounsaturated fats, are cholesterol-free and have naturally low levels of sugar and sodium."

Avocado is the only fruit that contains significant quantities of proteins, carbohydrates and fats as well as fibre. Nutrients in avocado include potassium, magnesium and Vitamins B, C and E.

In export markets the clean production standards of New Zealand avocados are also promoted to consumers.

Opportunities for adding value

ADDING VALUE FROM PROCESSED PRODUCTS

Around 90% of New Zealand grown avocados are sold as fresh fruit with a range of processed products making productive use of poorer quality fruit that may otherwise be wasted.



COSMETIC APPLICATION

Avocado oil is the most important processed avocado product in New Zealand and is produced by several companies. Avocado oil was originally extracted for use in cosmetics, and it continues to be used in various skin- and hair-care products for its moisturising and antioxidant properties.

FOOD APPLICATION

As a food product, avocado oil retains many of the health benefits of avocados, being high in monounsaturated fats, Vitamins A, D and E and high in lecithin and potassium. Avocado oil also has a very high smoking point of over 250°C making it good for frying, barbecuing and roasting. It is also a good carrier of other flavours.

Several companies produce avocado oil in New Zealand including Grove and Olivado. Olivado now claims to be the largest producer of extra virgin avocado oil – though mostly using [fruit grown in Kenya](#). It's a great example of a New Zealand company developing a new processed food product and taking it to the world.

Northland-based Cocavo produces novel products that are a blend of avocado and coconut oils.

Avocado can also be frozen or pulped for later use in food products. For example, frozen avocado is available and provided to New Zealand restaurants as chunks, slices and as pulp. The fruit is also processed and used in several ranges of guacamole products made in New Zealand.

Ovāvo have developed freeze-dried [avocado powder](#). This is promoted as a food ingredient with uses in products such as ice cream, chocolate truffles, muesli bars, tortillas, chocolate-flavoured breakfast drinks and hummus.

Freeze-dried avocado powder offers potential to become the second New Zealand-developed processed avocado product succeeding in [local and international markets](#).

HEALTH SUPPLEMENT AND NUTRACEUTICAL APPLICATION

Taken largely in tablet form, avocado oil is also used as a health supplement, to support joint, brain and heart health. The raw seed can be ground into a powder, providing prebiotic fibre, antioxidants and nutrients. There is also potential for use in nutraceuticals – one example being AvoB™, a bio-active extracted from avocados and used in supplements to support healthy blood sugar levels and metabolism.



POST-HARVEST OPPORTUNITIES

The phrase 'post-harvest' is widely used in the avocado industry to describe those activities that occur once fruit are picked. Provided commercial arrangements are agreed, it is likely, initially, that fruit grown in Taranaki would be freighted to another region for packing and cool storage.

The development of packhouse and storage facilities in the region would help develop the avocado industry in Taranaki. It is possible that a packhouse could also support other crops such as kiwifruit and late harvest fruit.

The biggest packhouses in the Bay of Plenty process up to 15m trays per season, often across kiwifruit and avocado. New Zealand's smallest packhouse processes around 200,000 trays per season. At the average annual yield of 12,070 trays/ha, that packhouse would process the production of just 16.56ha. It has however been advised that 3-4m trays (or 250-300ha of production) would more likely be the minimum feasible size.

Further investigations will be necessary to assess and confirm what level of Taranaki production will support an efficient and economic packhouse and coolstore operation. This needs to be considered alongside costs of compliance and transport operations including road and rail freight and shipping.

The development of packhouse and storage facilities in the region would help develop the avocado industry in Taranaki. It is possible that a packhouse could also support other crops such as kiwifruit and late harvest fruit.

What's the bottom line?

A financial model

As noted, there is considerable variation in the management regime and performance of avocado orchards.

Larger orchards are generally managed with a higher yield and higher cost model. Smaller owner operated orchards often have lower yields along with lower costs and can still generate an acceptable return for their owners.

This variation means care needs to be taken when preparing your financial model to ensure that yield, revenue and cost forecast are appropriate for the management regime of your orchard.

The Agribusiness Group have developed a financial model based on the higher yield and higher cost model. Their model targets a yield of 18.5 tonnes per hectare. This model may not be appropriate to your circumstances.

AVOCADO INDICATIVE COSTS AND RETURNS	
INDICATIVE FINANCIAL MODEL	An indicative model for setting up an avocado orchard in Taranaki has been prepared and is available on request. The summary information below is from the model. As noted in the disclaimer, you should seek your own independent professional advice.
Financial Summary Per Hectare	Hass variety
Yield tonnes/ha	18.5
Average 5.5kg trays⁷, indicative price/tray & Orchard Gate Return	3,364@ \$15/tray \$50,460
Labour, orchard & overhead costs	\$27,130 (excluding land costs, financing & income tax)
Time to First Harvest	3 years
Time to 100% Yield	10 years
Time to Cash Positive	10 years
Development Costs	\$49,750
Tree Life	Can be many decades in ideal conditions

INCREASE YOUR LAND VALUE

Establishing an avocado orchard provides opportunities for a considerable increase in land value largely based on cash flow and profit potential. For example:

- Taranaki dairy land that could be converted to avocado production is currently valued at around \$35,000-\$40,000/ha.
- Bare land suitable for avocado production in the Western Bay of Plenty is likely to be valued at \$125,000+/ha.
- Developed avocado orchards in the Bay of Plenty region were valued at over \$450,000 per hectare in 2017⁸.

⁷ Avocados are packed in 5.5kg trays – typically 20 larger avocados or 30 smaller fruit. Larger fruit return a higher price per tray.

⁸ PGG Wrightson Real Estate - HEARTBEAT - Rising demand for avocado properties (pggwre.co.nz)

Entry requirements

As discussed earlier, there are roughly 1,600 avocado growers with around 4,000ha of orchards. That's an average of 2.5ha per grower. Many of these orchards are owner-operated and smaller than this average size. A relatively small number are larger 20+ha orchards run by teams of professional staff and contractors. There are increasing numbers of these larger-scale orchards including the [development underway at Brixton](#) in Taranaki

The [Tupu LandUse Factsheet for avocados](#) suggests commercial scale orchards should be at least 25ha.

The key requirements are:



A block of land of sufficient size and with a suitable climate.



Access to sufficient capital for development (\$40,000-90,000 per ha⁹) and ongoing operating expenses.



Access to plant stock from a nursery.



Shelter – natural shelter is cheaper than artificial but needs to be planted up to two years ahead of avocado plants.



Access to a water supply sufficient to meet growing requirements.



Access to suitably skilled staff and/or contractors for orchard management.



A supply agreement with a packhouse and, if exporting, arrangement with a registered exporter.

⁹ This estimate is from the Lynwood Avocado Nursery presentation to Venture Taranaki Branching Out event. The Agribusiness model uses development costs of \$49,750/ha.

Establishing an orchard – what's required?

New Zealand Avocado provides information for new growers including the due diligence they recommend being completed before investing in avocados – both buying an existing orchard and planting a new orchard. Their advice is:

"Initial planning should take into account:

- Site selection including soil type, aspect, wind, run-off, temperatures in spring and likelihood of frost.
- Infrastructure around shelter, irrigation, fertigation. Where is your water going to come from?
- The rootstock or fruiting cultivar you will plant.
- Availability of bees for pollination, labour for harvesting and pruning, expert advice on nutrition for tree and soil.
- How will you manage the orchard? If you want it managed by contract, who might you seek to do that?
- Are you growing for export or NZ market only?
- Compliance requirements.
- Budgets and working capital required."

They also note that:

"The majority of packhouses have grower representatives and technical teams who support growers with advice and knowledge. Independent orchard management companies also offer a full range of services and equipment for growers. Field days, publications and knowledge sharing amongst growers will increase your knowledge base. A list of packhouses and orchard management companies can be found in our [industry directory](#)."

In planning a new orchard there are a few matters to note which need early attention:

- If planting natural shelter (which is cheaper than artificial shelter) it will need to be planted sufficiently far ahead of the avocado plants so it is established and providing shelter.
- The avocado plants will need to be ordered from a nursery. Plants are normally two years old when planted in the orchard. With the current growth in the industry the plants may not be available at short notice.
- Any resource management constraints need to be addressed including water supply.

Managing your orchard

As noted previously, the orchard management regime chosen can have a big impact on yield, returns and costs. Orchard design is also an important influence.

Avocados are medium-sized trees that can grow to 10+m in height. In New Zealand avocados are often planted 10m apart (100 trees/hectare) and left to grow to a large size. Many orchards are now planted in a denser 5m x 5m grid (400 trees/hectare) and trees are pruned to a more easily manageable height for picking. The lower height also lets more light through which encourages fruit development and higher yields. These higher yields need to be balanced against higher development and operating costs for more densely planted orchards.

New orchard management systems continue to be developed. The [New Zealand Avocado 2021 Annual Report](#) (p15) describes a future orchard production system that has just been planted with a:

"two-dimensional design with horizontal structural trunks low to the ground and productive vertical units growing up. The aim is to capture 80% of light coming into the block with even light distribution from the top to the bottom of the limbs. Trees are being monitored to explore if this is a viable growing system to boost yields and grower returns."

The very long harvest season of avocado means the industry does not have as strongly pronounced workflow peaks for orchard management and harvesting as other horticultural crops. There are still workflows though. New Zealand Avocado provides a [summary of key seasonal activities](#) and the seasonal changes that occur with avocado trees.

Throughout the year avocado orchard management will typically involve:

- Pest monitoring and control.
- Soil fertility monitoring and fertiliser application.
- Weed control.
- Soil moisture monitoring and irrigation.

Key seasonal tasks include:

- Arranging bees for pollination.
- Mulching.
- Pruning and removing any excess fruit.
- Picking.

New Zealand Avocado provides plenty of useful information for growers on orchard management:

- [Becoming an avocado grower - New Zealand Avocado \(nzavocado.co.nz\)](#)
- [Grow - New Zealand Avocado \(nzavocado.co.nz\)](#).

There is also a detailed Grower Manual available to members of the Association. A summary of the Manual content can be viewed on the [New Zealand Avocado website](#) and downloaded by members. There are five sections in the Grower Manual:

- Starting out.
- Trees and fruit.
- Land and environment.
- Pests and disease.
- Harvest.

Hard copies of the Grower Manual can be bought by Members at the Avoshop.

The New Zealand Avocado Grower's Guide "Reading Your Trees" can also be bought by members at the Avoshop along with subscriptions to Avoscene – the Association's official journal.

New Zealand Avocado oversees the AvoGreen production system which is a requirement for all export growers: [AvoGreen - New Zealand Avocado \(nzavocado.co.nz\)](#). Their website notes:

"AvoGreen is a responsible and auditable avocado production system which uses the principles of Integrated Pest Management (IPM), an internationally recognised approach, to ensure pesticides are used only when needed. AvoGreen is a requirement of export and all growers must be AvoGreen compliant in order for their crop to be exported.

It is an industry Export Market Strategy (EMS) requirement that PPINs¹⁰ are AvoGreen compliant in order to export fruit. To be AvoGreen compliant a Grower must have an accredited pest monitor monitoring their orchard for pests under the industry AvoGreen Programme. This can be done by contracting an AvoGreen Operator¹¹ or becoming licensed as an Owner-operator. Owner-operators undertake the responsibility for AvoGreen monitoring for a PPIN, using an accredited pest monitor."

In addition to the AvoGreen programme there are protocols for organic avocado production provided by [NZ Organic Avocado Growers Incorporated](#) which is associated with New Zealand Avocado.

¹⁰ [The Persea Property Identification Number](#)

¹¹ New Zealand Avocado has a list of AvoGreen Accredited Operators on its [website](#).

Growing conditions

Avocados originated in high areas of central America in climates that are warmer and less windy than Taranaki. Avocados will need plenty of care and careful site selection to grow and fruit well in the region.

Land with a gentle contour is preferred as it makes orchard management easier.

Avocados like fertile and free draining [volcanic soils, consistent rainfall and mild climates](#). While parts of Taranaki meet these criteria it is cooler than ideal for avocados – though climate change is likely to make Taranaki a more suitable location for avocados in future.

Avocados need free draining soils as the plants are susceptible to root rot if they get wet feet. Despite this, avocados also need a steady supply of water during the drier months and may need irrigation.

Avocados grow best in sites that are warm and sunny in summer – ideal day temperatures are 20-25°C. North-facing sites are best for avocados.

Avocados are sensitive to low spring temperatures and according to the [Taranaki Land and Climate Assessment](#) they require mean maximum temperatures to be above 15°C, 16°C and 17°C in September, October and November respectively and mean minimum temperatures in these three months to be above 8°C, 9°C and 10°C. These spring temperature minimums have an important influence on fruit set.

Avocados are also sensitive to frost. Minimum temperatures should not drop below 0°C.

These frost and spring and summer temperature requirements may place restrictions on the suitability of some parts of Taranaki for avocados.

Parts of coastal Taranaki, especially in North Taranaki are likely to be suitable for growing avocados (provided there is adequate wind protection). See the [Taranaki Land and Climate Assessment](#) report for more details. The following table is sourced from the Taranaki Land and Climate Assessment and details the mean maximum and minimum temperatures at various times of the year around the region.

VCSN station	Urenui 21741	New Plymouth 21442	Inglewood 21546	Stratford 21605	Ōaonui 30692	Hāwera 21610	Waverley 26825
Mean maximum temperatures (°C)							
September	18.5	17.9	17.2	16.6	17.6	17.8	18.2
October	20.0	19.4	18.8	18.4	18.9	19.4	20.0
November	21.9	21.3	20.7	20.3	20.9	21.3	22.0
Mean minimum temperatures (°C)							
September	7.9	8.0	7.0	6.1	7.7	7.0	7.0
October	9.2	9.2	8.1	7.3	8.8	8.2	8.4
November	10.6	10.5	9.5	8.6	10.1	9.6	9.8
Extreme annual minimum	-0.3	0.0	-0.8	-1.5	0.1	-0.8	-1.1

VCSN: Virtual Climate Station Network

Source: *Taranaki Land and Climate Assessment*.



Labour considerations

A small orchard can be run by an owner-operator likely using a lower yield and lower cost model. Larger orchards, focused on higher yields, will need additional staff and/or contractors for a range of orchard management activities.

As noted above:

- The extended picking season means there is not the same seasonal labour pressure as with most other crops. However, there will still be pressures accessing skilled labour.
- One hundred hectares of avocado would likely employ around 25 people plus several contractors and provide employment for the owners of perhaps five 20ha blocks.

As with any other business, health and safety is a vitally important consideration. Business owners and directors have primary responsibility for the health and safety of their workers and contractors on-site.

Avocado orchards and post-harvest operations involves a range of hazards and due care must be taken to identify them, mitigate them and provide appropriate protection and training to avoid incidents occurring.

Potential for the region

WHAT AN EXPANDED AVOCADO INDUSTRY IN TARANAKI COULD LOOK LIKE

A reasonable scenario for Taranaki in the near future is for an additional 100ha of avocado to be planted. This is comparable in scale to a typical Taranaki dairy farm.

According to the financial model developed for Venture Taranaki by Agribusiness, 100ha of avocado would:

- produce revenue of just over \$5m,
- provide a cash operating surplus of just over \$2.3m, and
- employ around 25 people plus several contractors.



Environmental impact

Many consumers of avocados expect their fruit to have been produced cleanly and sustainably.

As noted above New Zealand Avocado oversees the AvoGreen production system which is a requirement for all export growers: [AvoGreen - New Zealand Avocado \(nzavocado.co.nz\)](http://nzavocado.co.nz).

This is an auditable avocado production system based around the principles of integrated pest management and is designed to limit the use of pesticides. AvoGreen is a requirement for export growers. It provides a safer and healthier working environment on orchards while delivering sustainably produced fruit to consumers.

In its 2020/21 Annual Report New Zealand Avocado noted (p11):

"NZ Avocado's sustainability strategy supports the industry's licence to operate through better understanding its environmental footprint, providing information enabling growers to be economically sustainable and to see positive social impacts where avocados are grown in rural New Zealand."

In addition to the Avogreen requirements, avocado growers need to meet the requirements of the local Councils District Plan and obtain consents from the Regional Council for the use of water for irrigation and for any discharges to the air or waterways.

REGENERATIVE PRACTICES

Regenerative farming relates to an integrated whole system approach to agriculture in which the natural environment is regenerated while food and fibre is produced, allowing for improved outcomes on farm and beyond the gate. Principles of working cooperatively with nature and focusing on soil health, as a productive starting point, guide practices that have likely beneficial outcomes for soil, water, air, climate, biodiversity, nutrient cycles, plant and animal health, human wellbeing, social license, and economy. Considering regenerative practices and Te Taiao are useful when considering environmental implications.



Local avocado orchard owner, Matt Hareb

Next steps

YOUR SUPPORT TEAM

Venture Taranaki has set up the Avocado Growers Group, to support those interested in growing avocados in Taranaki.

The expansion of the avocado industry from the modest area currently planted is already underway. The first larger scale commercial orchard is being developed at Brixton and other growers have trees ordered for planting in the near future.

As the industry grows there will be opportunities for associated support services to be provided locally. These opportunities may leverage off development in other horticultural sectors such as kiwifruit.

These will also be opportunities for the industry to work co-operatively on matters of mutual interest.

It is also suggested that you join the New Zealand Avocado Growers Association. This will provide you with access to New Zealand Avocado's resources.

New Zealand Avocado provides a [directory](#) of industry supply chain providers including consultants, registered packhouses and registered exporters. While none are based in Taranaki some will be able to provide services in the region.

There are existing avocado growers in the region who may be willing to provide advice on growing avocados in Taranaki conditions.

FUNDING OPPORTUNITIES

The source or sources of funding for development of an avocado orchard or processing opportunity will depend on the circumstances of the party or parties carrying out the development and the structure of the proposed investment.

- Some New Zealand banks will have personnel with experience in assessing avocado and/or processing opportunities and providing loans for developments.
- Developments of avocado orchards may also be funded by the landowner – perhaps using equity and cashflow from an existing farming or other business operation that continues in conjunction with the orchard development.
- There are also developments part-funded by syndicators, such as [MyFarm Investments](#), where equity is provided from multiple investors. For example, in 2018 MyFarm syndicated the [Aupori Avocados Limited Partnership](#), a 43 canopy hectare¹² development in Northland with a total asset value of \$10.38m.
- Other sources of funding may also be available for specific activities such as R&D. Venture Taranaki can advise on whether there are other such funding opportunities.

¹² Canopy hectares refers to the actual area in production. For example, a 43 canopy hectare development will likely require a property of around 60 hectare in total area. The balance will be used for tracks, shelter and buildings and also likely include waterways or poorer land that cannot be used productively.

CHECKLIST AND ACTION GUIDE FOR INTERESTED INVESTORS

If you are a/an:

- Taranaki landowner – with 2-5+ hectares suitable for avocado development
- Avocado grower, contractor or processor – with an interest in diversifying into Taranaki
- Investor – with an interest in supporting new avocado development in Taranaki
- Syndicator – with an interest in packaging a development and investment opportunity in Taranaki.
- Register your interest with Venture Taranaki.

REVIEW FURTHER INFORMATION

- Venture Taranaki Avocado seminar (2021): [Avocado » Taranaki, New Zealand \(venture.org.nz\)](https://venture.org.nz)
- [Taranaki Land and Climate Assessment report](#)
- New Zealand Avocado: [Home - New Zealand Avocado \(nzavocado.co.nz\)](https://nzavocado.co.nz)
- ANZ Agri Focus – Holy Guacamole (2018): [ANZ-AgriFocus-20180305.indd](#)
- Tupu NZ Factsheet on Avocados: [Commercial avocado growing NZ: statistics and guidance \(tupu.nz\)](https://tupu.nz)
- Ministry for Primary Industries Avocados Go Global programme: [New Zealand Avocados Go Global | MPI | NZ Government](#)

CONSULT ADVISORS ON AVOCADO PRODUCTION AND PROCESSING

New Zealand Avocado provides a directory of industry contacts: [Directory - New Zealand Avocado \(nzavocado.co.nz\)](https://nzavocado.co.nz)

Get in touch, email branchingout@venture.org.nz

Appendices:

APPENDIX A: HISTORY OF AVOCADOS IN NEW ZEALAND

According to [New Zealand Avocado](#) the avocado plant was introduced to New Zealand from California around 1920. The [first known trees](#) were planted in Gisborne and the first commercial sales of avocado fruit in New Zealand occurred in 1939.

The Grey's identified the Californian Hass variety as having particular promise in New Zealand. It was found to be a *"good consistent cropper with fruit of very high quality, and a tree which is compact and tidy in growth."*

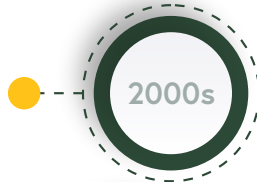
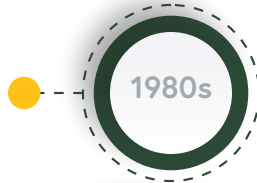
Since then Hass has dominated avocado plantings in New Zealand (as it has in other countries). One of the avocado industry's major challenges was also identified by the 1960s – irregular bearing from one year to the next.

Until the mid-1960s the Grey's orchard was the only commercial avocado orchard in New Zealand.

By 1980 there were sufficient growers to form a New Zealand Avocado Promotion Committee.

Initial exports to Australia occurred.

First commercial plantings in Taranaki.



After World War 2 seeds of many avocado varieties were imported and grown by the Grey family near Gisborne. The Grey family, their avocado orchard "Avogrey" and their newly developed Eclipse variety were featured in [Country Calendar](#) in August 2021.

More avocado orchards were established with most plantings occurring in the Bay of Plenty and Northland regions.

The avocado industry began expanding, particularly in the Bay of Plenty and Northland regions. Exports began to other countries.

[New Zealand Avocado](#) becomes the operating entity.

The avocado industry has grown strongly, with further growth forecast.

ABOUT VENTURE TARANAKI

Venture Taranaki is the regional development agency for Taranaki. The organisation is responsible for regional development strategy, enterprise and sector development, investment and people attraction, and major project initiatives which contribute to the inclusive and sustainable growth of the region. Venture Taranaki is a registered charitable trust and a New Plymouth District Council Controlled Organisation, supported by the three District Councils of the Taranaki region.

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