

Branching Out Blueprint

Hops

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 hops 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, *Hops: The opportunity for Taranaki*, June 2022

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Hops: A snapshot

UNTAPPED POTENTIAL

- New Zealand has developed unique varieties of hops that are in strong demand by the craft brewing industry - both locally and in export markets. There appears to be considerable unmet demand for more New Zealand hops.
- The commercial production of New Zealand hops currently occurs only in the Tasman and Nelson Districts. There is limited opportunity for further expansion in those areas creating opportunity for hops to be developed in other New Zealand regions, including Taranaki.

GROWTH TARGETS:
While there's not an agreed target for the full industry, one of the industry groups – Hāpi – is targeting exports to increase to \$132m by 2027.

SECTOR TURNOVER:
New Zealand produces around **1,500 tonnes** of hops per year.

WHY NOW?

- There is international demand for New Zealand hops that is not being met and is unlikely to be met with production in the existing growing region.
- There is likely demand for local hops from the developing Taranaki craft brewing industry. High quality locally produced hops would add to the story of their brews.
- There is encouragement from within the hops industry for production in new regions such as Taranaki

Considerable room for market growth as New Zealand only provides about 1% of global hops production.

85% is exported and earns around **\$40m.**

WHY TARANAKI?

Taranaki has many of the requirements for growing hops. There are many locations with suitable soils, regular rainfall, mild temperatures, high sunshine hours and the right length of summer daylight hours.

There are two other requirements that will not be so widely met:

- Hops require a specific level of winter chilling that will likely only be met in inland parts of the region.
- Hops are susceptible to wind damage and will require very good shelter to succeed in Taranaki.

Provided these requirements can be met there is potential for the hops industry to develop in Taranaki – both growing and processing – to meet market demand and support the local craft brewing industry.

WHO SHOULD BE INTERESTED?



Taranaki farmers looking to diversify their income stream.



Growers from the Tasman and Nelson Districts looking to reduce risks from the current regional concentration (e.g. weather events) and/or to take advantage of lower land costs for suitable land in Taranaki.



Taranaki-based craft brewers wanting to add to the local story of their brand.



Investors exploring development opportunities in a growth industry.

VALUE ADDED OPPORTUNITIES

- Hops have always been a value-added crop largely used in the production of beer.
- There is a very small market for fresh hops. Most hops are dried and pelletised while some are processed using supercritical CO₂ extraction.
- While beer brewing remains the core market for hops there are other opportunities that have been developed or are being considered. There are nutraceutical opportunities including as a hunger suppressant and as a sleep aid. Hops also have antibacterial properties.
- Extracts can be used in a range of products including balms and teas.
- The waste product also has potential as a fibre.

RISKS AND SENSITIVITIES

- Mitigating the climate restrictions in Taranaki – particularly wind.
- The lack of local knowledge and experience with hops will require workforce and skill development.
- R&D will also be required including trials to confirm management regimes suitable for Taranaki conditions.
- Gaining access to the optimal varieties may be challenging – there may be plant variety rights licensing conditions that restrict their use in Taranaki.

FARM FINANCIALS

Minimum viable land: 40ha (optimal size likely 150ha - see pg. 14).

Initial Capital Investment for growers:

- Development costs: \$7,380,000/ 40ha
- Total revenue/ 40ha when at 100% production: \$2,508,408
- Time to 100% yield: Year 3
- Time to cash positive: Year 1

POTENTIAL RETURNS FROM ONE SCENARIO OF HOPS DEVELOPED IN TARANAKI¹

Based on the financial model prepared for Venture Taranaki, 150 canopy hectares of hops would potentially:

- Yield 261,300 kg of T90 pellets
- Produce revenue of \$9.41m at an average price of \$36/kg
- Produce a cash operating surplus of around \$7.17m
- Employ around 12 FTE year-round and additional FTEs for seasonal work

A development of 150 canopy hectares of hops would have significant economic impact in Taranaki. It would also encourage further development of the local craft brewing industry.

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 wind conditions	2
Suitable land available at reasonable cost	4
Existing investment interest	2
Local development experience	1
Potential for circular economy opportunities	3
Established local, domestic, and international demand	5

Product Opportunity

Large and growing demand for New Zealand hops	5
New Zealand hops differentiated in key markets	5
Contribution to health and wellness of the consumer	3
Established sustainable/ regenerative growing practices, including water usage	4
Reduced greenhouse gas emissions compared to existing land uses	4

Postharvest and Processing Opportunity

Postharvest and processing facilities available in Taranaki	1
Opportunities for development of added value products	4

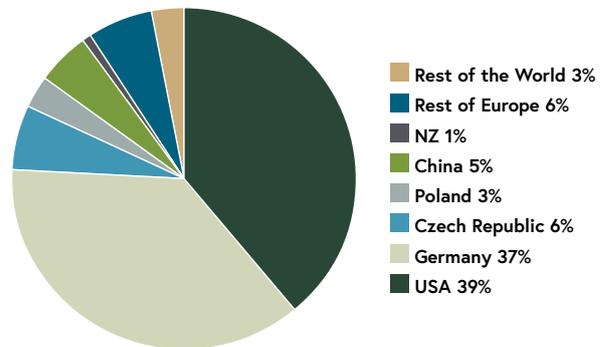
¹ Canopy hectares refers to the actual area in production. For example, a 115 canopy hectare development will likely require a property of around 150 hectares in total area. The balance will be used for tracks, shelter and buildings and also likely include waterways or poorer land that cannot be used productively.

New Zealand's hops industry

Hops have been grown in New Zealand for beer production since the 1840s. This initially occurred in several regions but over the past 150 years the hops industry has become concentrated in the Tasman and Nelson Districts where there are ideal growing conditions.

The industry initially developed to provide hops for local production of beer. Over the past 50 years the hops industry has become increasingly focused on exports and New Zealand grown hops now compete against hops grown around the world.

The global production of hops is dominated by the north-western United States, particularly Washington State, and the Hallertau region in Bavaria, Germany. Both countries produce 30,000 - 40,000 tonnes of hops per year and produce over half the world's commercially grown hops. The rest is spread over several other countries including New Zealand²:



According to a recent New Zealand Herald [article](#):

- Around 1,500 tonnes of hops are produced each year in New Zealand – about 1% of global production.
- Around 85% of the New Zealand harvest is exported to more than 40 countries generating almost \$40m in revenue.



² From www.knoema.com as reported by Lincoln University's report for Hāpi (p10)

The remaining 15% of hops supply the local market suggesting New Zealand demand is around 225 tonnes per year. Some hops are also imported into New Zealand, particularly from the USA.

Just over 1,000 tonnes of hops are marketed by grower cooperative company [NZ Hops Ltd](#) which tightly controls access to key hops varieties and hops production amongst its member growers. The balance of hops are grown and marketed by several independent companies such as Freestyle Hops which was one of the originators of Hāpi Research Ltd.

The [Hāpi programme](#) is encouraging wider production of hops including in other regions and overall growth in the industry. It is expecting:

"hop revenue to grow to \$132 million per annum by 2027, which is \$89 million higher than the revenue forecasted without the programme. In addition, the programme expects craft beer revenue to grow to \$98.5 million per annum by 2027, which is \$82 million higher than the revenue forecasted without the programme. The growth in both hop and craft beer would be driven by exports.

The co-investors expect 835 new jobs to be created across the hop growing and craft brewing industries if the economic goals are achieved."

The financial models discussed later in this Blueprint have assumed average prices of \$36/kg of T90 pelletised hops. This is the format in which most hops are sold.

Prices for hops vary between varieties. It was noted in early 2021 that pricing for hops is:

"in a range between \$40/kg for the market-leading Nelson Sauvín to \$65/kg for the more fickle Riwaka variety. Local brewers will pay about \$40/kg for imported US brands, which are plentiful."

Current prices for several varieties can be checked on the [NZ Hop Market](#) website. At the time of preparing this document prices ranged from \$24.25/kg for Pacific Jade to \$53/kg for Nelson Sauvín.

Similarly to kiwifruit, where the New Zealand developed and controlled Zespri™ SunGold™ Kiwifruit variety attracts

premium prices, there is opportunity for [New Zealand controlled and grown hops to achieve both growth in sales and premium prices](#) in international markets.

DRIVERS OF GROWTH

The key driver of growth for New Zealand hops is demand driven by the craft beer industry. As Grant Payton suggested in his 2018 study ["Beyond the Borders of Nelson: the opportunity for growth of the New Zealand Hop Industry"](#):

"Craft brewing and the rapid growth of this market globally has seen an increased demand for the raw ingredient of hops. The two products are intrinsically linked with the growth of one supporting the growth of the other."

Payton reported that: ["According to the ANZ and the New Zealand Craft Beer Industry Insights Report, Edition four 2017, there are 194 craft breweries in New Zealand. An increase of 102% over the three-year period from 2014."](#)

More [recent reports](#) from the [Brewers Association of New Zealand](#) suggest there are at least 257 breweries in New Zealand, more breweries per 10,000 people (0.51) than the United Kingdom (0.42), Australia (0.29) and the United States (0.23). The Association publishes [a list of their members](#). The [Brewers Guild of New Zealand](#) is another industry association.

There is also strong demand for New Zealand hops in the USA craft brewery industry. A 2016 [article](#) from Punch Drink discusses why there is such strong demand in the USA:

"Fruity, citrusy and highly aromatic, New Zealand hops are some of the hottest varieties on the market right now. They're also nearly impossible to get..."

...But the popularity of New Zealand hops also has to do with something much more human: the relentless pursuit of the new ... New Zealand hops represent just that – novel flavours not available from any other region in the world."

The US Brewer's Association [publishes data](#) on the number of US breweries showing the strong growth in that market which in turn is driving strong demand for New Zealand hops:

RECENT U.S. BREWERY COUNT

	2015	2016	2017	2018	2019	2020	2021	2020 to 2021 % Change
Craft	4,803	5,713	6,661	7,618	8,419	8,905	9,118	4.4%
Regional Craft Breweries	178	186	202	230	240	220	223	1.4%
Microbreweries	2,684	3,319	3,956	4,518	1,917	1,898	1,886	-0.6%
Taprooms					3,091	3,471	3,708	6.2%
Brewpubs	1,941	2,208	2,503	2,870	3,171	3,302	3,307	0.2%
Large/Non-Craft	44	67	106	104	111	120	129	7.5%
Total U.S. Breweries	4,847	5,780	6,767	7,722	8,530	9,025	9,247	2.5%

An [article](#) from 2019 reported on similarly strong demand in the UK.

Payton reported (p14 - 15) on strong unmet market demand for New Zealand hops in several other countries including Japan, Taiwan, Korea, China and the UK:

"Bluestone Brewing owner Simon Turner, Wales, made the following observation when quizzed on the opportunity for expansion of New Zealand hops to the UK Market. 'I would say that in the UK, New Zealand hops are, in general, highly sought after and in short supply. The craft beer boom is also gathering momentum in Europe albeit slowly by comparison with UK and USA, so the market is growing' ...

To further support the potential for growth of New Zealand hop production, market feedback from Ben Adams, Charles Faram technical sales specialist, when posed with the simple question, 'If more New Zealand hops such as Nelson Sauvignon could be grown, how much could the market tolerate?' met with the response: 'You could double current production and this would not have an impact!'"

While the link between the rise in craft brewing and demand for New Zealand hops is well-established, what is driving this demand from the craft breweries?

Payton suggests (p14) that it is the types of beers the breweries are making:

"The growth of the US market has seen an unheralded demand for hops, in particular 'specialty hops' (aroma/flavour hops) to suit the demands of beers styles such as Indian Pale Ale (IPA) and American Pale Ale (APA). Two beer styles that are brewed at higher hop rates than traditional lager beers."

Payton reported on an approximately 66% increase in the average hopping rates used in craft beers between 2007 and 2016.

In addition to the increasing demand for aroma hops, the opportunity for New Zealand hops compared to hops from other countries, is driven by three other key factors:

- Demand for New Zealand specific varieties
- Demand for the aromas produced by New Zealand grown hops i.e. the outcome of the terroir³
- The clean production of New Zealand hops reflecting the relative lack of pests and diseases in New Zealand and the environmentally friendly means of controlling the issues that do occur.

Payton concluded (p17):

"With a growing craft beer scene both domestically and internationally there is no immediate evidence to suggest the market demand for New Zealand hops will disappear any time soon."

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³ A term widely used in the wine industry to refer to the combination of characteristics of a specific location – that result in identifiable outcomes such as flavour and aroma.



MARKET ACCESS

While there is strong demand for New Zealand hops, developing new routes to international markets from scratch will have challenges. It is likely less risky to work with an existing hops marketing company.

For many decades the Hop Marketing Board had a monopoly on hops marketing in New Zealand. While the industry was deregulated in 2003, the Board's successor, [NZ Hops](#), still exerts considerable influence over the New Zealand hops industry, controlling access to many varieties developed by [Plant & Food Research](#) and the route to market for around 2/3 of current production.

The [Hāpi programme](#) operates independently of NZ Hops and is developing new varieties and encouraging development in new regions.

Several independent companies market commercial quantities of New Zealand hops: including [Clayton Hops](#), [Hop Revolution](#) and [Freestyle Hops](#) (including via [NZ Hop Market](#) where growers Pikimai Hops and Keith Henderson also sell hops).

COMPETITION

Hops do not appear to be directly competing with any other crop in the beer production market. There is a 1,000-year history of using hops and while, in theory, alternatives to hops could be developed, there is little likelihood of that occurring. Hops are an integral part of the story of beer and it is likely that while beer is produced there will be demand for hops.

There is however, potential for a change in consumer and/or brewer trends from the hops-intensive beer styles currently favoured to styles of beer which require less hops or different styles of hops. If there is a change to different styles of hops New Zealand may not be in a position to respond quickly with suitable varieties.

New Zealand hops are also competing with hops grown in other countries. At the moment several key varieties of New Zealand hops are only grown in New Zealand. Some of these varieties are due to lose their plant variety rights protection soon and will become available to be planted in other countries. It is yet to be seen whether these varieties will grow well in other countries with different disease and pest regimes and/or whether these varieties will produce similar characteristic in other locations.

In a very specific sense, the development of hops in Taranaki faces competition from other regions that may or appear to be, better suited to hops production. For example, Payton's 2018 report focused on the potential for hops production in Gisborne, Hawkes Bay and Clyde. These existing horticultural regions may attract investment interest ahead of Taranaki.

Main hop growing regions in New Zealand and the opportunity for Taranaki

All New Zealand's commercial production of hops occurs at the top of the South Island in the neighbouring Tasman and Nelson districts.

These districts have ideal growing conditions for hops with good soils, regular rainfall, suitable winter chilling, suitable daylight hours, mild summer temperatures, high sunshine hours and low wind run. However, they are running out of land that is suitable and available for hops production and there is interest in exploring opportunities in other regions, including Taranaki.

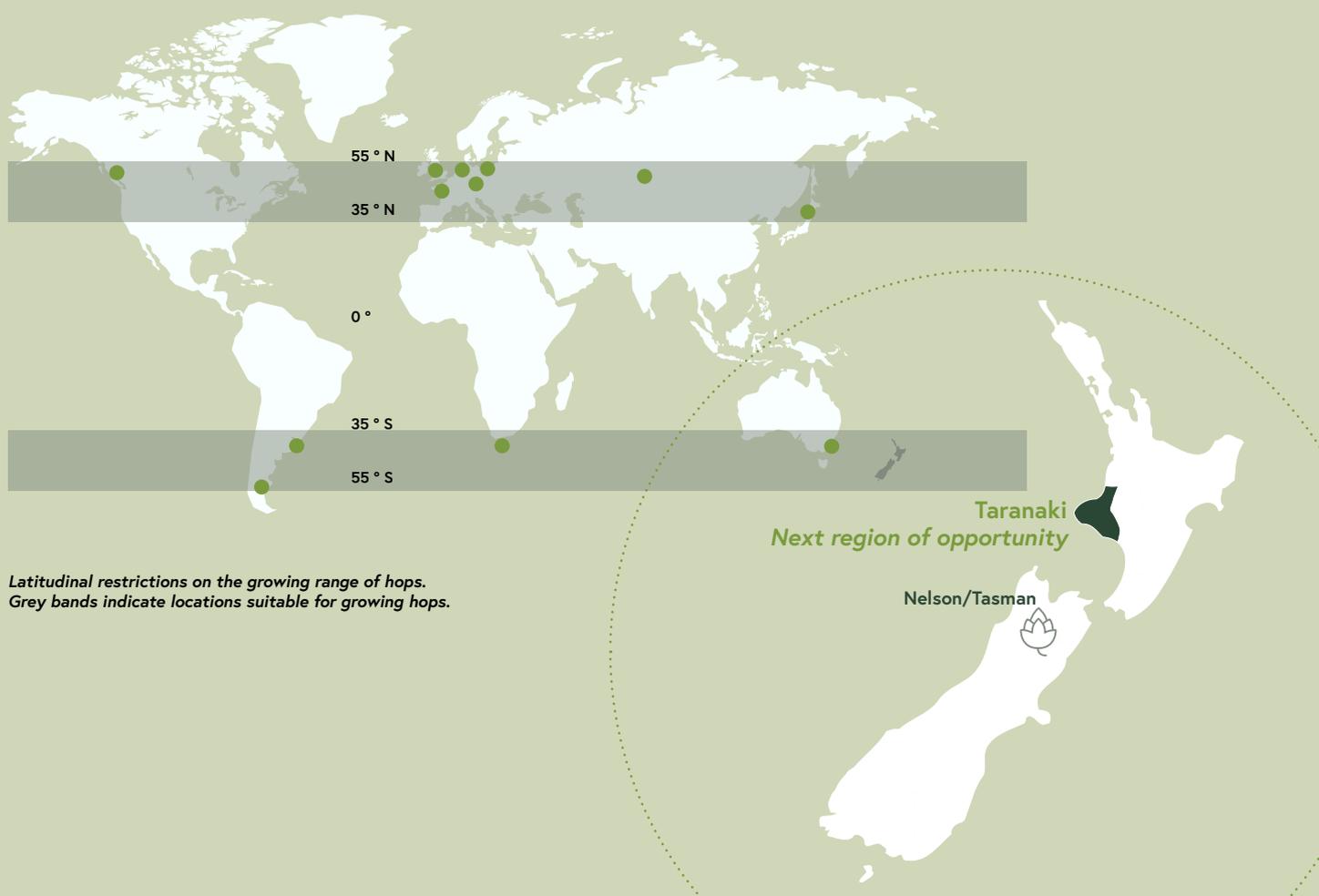
There is encouragement from key players for hops to be grown in new regions to;

- meet market demand for New Zealand hops,
- spread production risk (e.g. an incursion of a pest or disease or weather events such as the [Boxing Day, 2020 Motueka hail storm](#)), and
- develop new terroir with localised characteristics.

Importantly, hops have a latitudinal restriction on their growing range – between 35 and 55 degrees north and south of the equator.

At 39 - 40° south, Taranaki fits into this zone and is also a region which appears to have locations with suitable soils, regular rainfall, mild summer temperatures and high sunshine hours.

The key challenges for hops appear to be addressing the winter chilling requirements and providing sufficient and suitable shelter to mitigate Taranaki's relatively high wind run.



Latitudinal restrictions on the growing range of hops. Grey bands indicate locations suitable for growing hops.



The hop industry supply chain

Setting up and developing a hop garden requires a range of supporting services. Relationships will need to be established with:

- Advisors and consultants with hop industry experience to assess specific opportunities and advise on garden establishment and operations.
- Financial advisors to support and/or package development projects.
- Nurseries to provide plant-stock.
- Contractors to help establish orchards and to help with orchard management.
- Rural sector retailers to provide the equipment and supplies needed for orchard operation.
- An operator of drying facilities (if not part of the garden development).

- A cool store operator.
- Transport companies to move dried hops.
- A pelletising company to produce and pack hop pellets.
- Possibly a provider of supercritical CO₂ extraction services.
- A company or platform for marketing hops.

Many of these services will likely be initially provided from the Nelson or Tasman Districts where the industry is already established.

As the hops industry develops in Taranaki, local support service opportunities will develop. Some of these may be complementary to other horticultural and agricultural sectors operating or developing in Taranaki.

There are also industry bodies and companies which new growers can engage with including [NZ Hops](#) and [Hāpi](#).

The hop plant and key varieties

THE HOP PLANT

- The commercially grown hop plant (*Humulus lupulus*) is native to Europe, western Asia and North America. There are several other humulus species but only *Humulus lupulus* is grown commercially.
- While a member of the Cannabaceae family and related to *Cannabis sativa*, the hop plant does not contain the cannabinoids that provide the psychoactive effects of marijuana. It does however, contain a range of other chemicals which have very useful properties for brewing beer and several other uses.
- The hop plant is a quick growing, perennial climber. Hop stems (or bines⁴) are trained to grow up strings in hop gardens and can grow 6 - 9 meters in a season. Trellises in hops gardens are usually 5 metres high.
- New Zealand is free of most of the pests and diseases that affect hops in other countries. This allows hops to be grown without sprays – which helps the marketability of New Zealand hops.
- Hops are dioecious with separate male and female plants.
- The female flowers, usually called cones, have lupulin glands that contain the various alpha acids, beta acids and essential oils that provide bitterness, flavour and aroma for beer.
- Male plants are removed from hop gardens to ensure the female flowers are unfertilised – as hops seeds affect beer quality.
- The female flowers form in summer. In New Zealand they reach maturity and are harvested from the end of February, through March and into the first few days of April. The exact timing of harvest is dependent on variety.
- At the end of the season the plant dies back over winter before shooting away again in the spring. Hops require winter chilling to grow and flower productively.
- Each variety of hops has slightly different day length requirements. Taranaki stretches from 39-40 degrees south and is in the suitable day-length zone – but may suit some varieties better than others.

TYPES OF HOP PLANT AND KEY VARIETIES

- There are hundreds of varieties of hops grown around the world. The bulk of New Zealand commercial production is from fewer than 20 varieties, mostly new varieties developed in New Zealand.
- The hop varieties can be broadly grouped into three types:
 - Bittering hops
 - Aroma hops
 - Dual purpose hops.
- Hops also have [antibacterial properties](#) which assists the yeasts used in brewing and provides stability to the brewing process.
- Bittering hops contain higher levels of alpha acids – humulone, adhumulone and cohumulone – which largely provide the bitter flavour to beer. Beta acids also play a role but are considered less critical.
- Aroma hops contain higher levels of various essential oils which can vary depending on soil, water and climate. Myrcene and humulene are the key essential oils.
- Dual purpose hops contain useful combinations of both alpha acids and essential oils.
- Data on hops varieties normally reports the:
 - Alpha acids as a percentage of hop weight. The percentage of cohumulone in the alpha acids is sometimes reported separately as it provides harsher bitterness that is not desired by all brewers.
 - Essential oils as a percentage of hop weight with myrcene and humulene sometimes specified.
- Hops were traditionally grown more for their bitterness than their aroma. The proportion of aroma hops grown has increased significantly in recent decades driven by the craft brewing industry's exploration of new aroma driven styles of beer.
- There are currently 17 hop varieties grown in New Zealand that were developed by Plant & Food Research including Pacific Gem™, Green Bullet™, Wakatu, Pacifica™, Southern Cross™, Motueka™, Riwaka™, Nelson Sauvín™, Pacific Jade™, Rakau™, Kohatu®, Wai-iti™, Taiheke®, Waimea™, Wakatu™, Moutere™ and Nectaron®.

⁴ The hop plant stems are botanically bines rather than vines. Vines use tendrils or suckers to cling on and grow upwards. Bines wrap their stems around whatever support they can find – such as the strings in a hop garden. Hop bines always grow clockwise.

- The two most important varieties are Nelson Sauvignon™ and Motueka™ which make up nearly 50% of the crop though the new Nectarone® variety is showing considerable promise. New varieties continue to be developed and can be expected to be subject to Plant Variety Rights and possibly exclusive arrangements with specific companies. For example, the [Nectarone®](#) variety is controlled by [NZ Hops](#).

- Hāpi has advised that:

"Growers pay an annual licence per hectare to the PVR (Plant Variety Rights) owner to grow select varieties. This amount varies depending on the market value of the variety but typically is in the vicinity of \$2-5k/planted hectare/year.

The likes of NZ Hops Coop and Freestyle Hops have established channels to market, both domestically and internationally which could be accessed with sufficient volume and quality. Longer-term establishment of direct channels would be possible with sufficient volume and quality and investment in business development resourcing. Hops are a niche/premium product and there does not exist a highly liquid, generic commodity channel to sell through in the absence of a specific marketer or direct sales pathway."

- The Hāpi programme is also [developing new varieties](#). Their "main goal is to commercialise three new premium varieties and support the release of three royalty-free varieties."
- There are also some international varieties of hops grown in New Zealand – including NZ Cascade. This is now known as Taiheke® to differentiate it from Cascade hops grown elsewhere.
- Leading hops marketers [NZ Hops](#), [Freestyle Hops](#), [Hop Revolution](#) and [Clayton Hops](#) provide information on some key New Zealand-grown varieties on their websites.



Opportunities for adding value

The key value-added hop product is, of course, beer. There are also some other traditional uses of hops which continue to be of market interest and new value-added products.

PELLETS

For centuries dried hop cones were the standard form used in the brewing process – though fresh cones were and still are used by some, mostly small, brewers. More recently hop pellets have become the form in which the majority of hops are provided to commercial brewers. These are ground up and pelletised whole hops – though with some plant material removed.

Most hop pellets are T90 pellets. The T is short for Type and the 90 refers to the ratio of the mass of pellets produced compared to the dried hops that enter the process. With T90 pellets 100kg of whole hops results in 90kg of pelletised hops. There are also more concentrated T45 pellets.

Pellets are more stable than whole hops and less subject to oxidising.

There are two pelletising plants for hops in New Zealand – both in Nelson. Pellets are provided in 5, 20 or 25kg cartons to commercial brewers and in smaller packets (often 100g) for home brewers.

Whole hops are still available and preferred by some brewers. Bales of around 120kg are provided to commercial brewers and 1-10kg bags for those brewers who prefer smaller quantities.

HIGH VALUE PRODUCTS

While most hops production is currently used in the production of beer there is interest in the development of other uses for hops. Below is a list of some of the value-added products currently available. Further R&D is likely to reveal other opportunities.

- Supercritical CO₂ hop extracts are also produced in New Zealand by Nelson-based [Pharmalink Extracts](#) and sold by [NZ Hops](#). Some brewers [prefer using](#) the supercritical CO₂ hop extracts.

The extract is described as a:

"golden to tan, thick honey-like paste with all the natural hop variety specific brewing characteristics. As a pure resin, the alpha acids concentration is variety specific, typically between 25% and 60%. CO2 Hop extract typically contains between 3% to 12% hop oils, depending on variety."

- UK-based Totally Natural Extracts sells a [range](#) of New Zealand hop oils. These are produced and also [jointly promoted](#) in association with NZ Hops.
- Plant & Food Research [suggests](#):

"Hops could also be the next big thing for the wellness sector, with high concentrations of compounds known to be good for health. Being a close relative to cannabis means the two plants share a lot of properties, but the legislation surrounding cannabis may mean hops offers more options for nutraceuticals."

- Hops and marijuana contain [some shared chemicals](#) that are thought to provide sedative effects. Hops have been:

"traditionally used as an herbal sleep remedy and can be taken orally or sewn into 'hops pillows.' These pillows release their aroma into your bedroom and are thought to help you drift off to sleep more easily"

- Plant & Food Research's [investigations identified a hops extract](#), Amarasate, that has been shown to control feelings of hunger. It has been licensed to [Calocurb](#) and is sold as an appetite management supplement.
- Plant & Food scientists hope to explore more potential uses of hops as a nutraceutical. Plant & Food scientist [Kerry Templeton says](#):

There are two pelletising plants for hops in New Zealand – both in Nelson. Pellets are provided in 5, 20 or 25kg cartons to commercial brewers and in smaller packets (often 100g) for home brewers.



"Hops has a history as a natural aid for sleep and some of the compounds found in hops have been shown to have benefits for anxiety, appetite suppression and even cancer. More work is needed to better understand these compounds and breeding new varieties with the right chemical composition would take time. But hops could be a huge opportunity for the nutraceutical industry."

- The antibacterial properties of hops are also of interest outside the brewing industry and [antibacterial hop products](#) are produced.
- The shoots of hops are a [novel and very expensive vegetable](#) that looks similar to asparagus. The expense is apparently due to the [difficulty in harvesting](#) reasonable quantities. They are described as tasting awful when raw but when cooked have a kale like quality with a slight nutty flavour.
- Hops can also be used in a [range of products](#) such as teas, soaps and even lip balm.
- The hops relative *Cannabis sativa* is also used as hemp which is processed into textiles and various other products. Hops have also been [used historically](#) for fibre production.
- The potential for the waste product from the bines that are cut down when hops are harvested to be processed for fibre production is [being investigated](#) and could add further value to the industry.

PROCESSING INFRASTRUCTURE REQUIREMENTS

The processing infrastructure required for the use of hops in the brewing industry is well established.

Clayton Hops provides a good [summary of the stages of hops processing](#) that occurs on the hop garden (including a video). Their summary covers the steps until dried hops are placed in bales.

Stripping and cleaning

- When hop flowers are harvested the bines and stems to which the flowers are attached are also harvested. The first step in processing hops is stripping the flowers from this unwanted plant material. This is done by a picking machine which also cleans the hops.

Drying

- Drying reduces the water content to 8-10% so that the hops can be stored until needed.
- Hops are dried in kilns where warm air from below moves through a layer of hops. This requires an appropriate balance between temperature, the speed of airflow and the depth of the layer of hops. The hops do not come out of the kiln evenly dry so they are then stacked for a period which helps equalise the moisture content.
- While there are established processes for on-garden drying of hops other techniques for drying hops are being explored and may be of interest to growers in Taranaki including when drying trial crops. For example, Massey University has trialled [atmospheric freeze drying](#) of hops.

Baling

- Once dried evenly the hops are then baled – in bales that are similar to wool bales.

Cool storage

- Dried hops will remain in good condition provided they are kept in appropriate cool storage facilities.

Pelletising and packing

- While some customers prefer dried hops many prefer pelletised hops.
- Pelletising is carried out at specialised pelletising plants. As noted earlier there are two hops pelletising plants in Nelson.

Super critical CO₂ extraction

- This is also a process carried out at specialised plants including one near Nelson.

What's the bottom line?

A financial model

An indicative model for setting up and running a 40ha hops garden has been prepared for Venture Taranaki and is available on request. The summary information below is from the model.

As noted in the disclaimer to the model you should seek your own independent financial advice. The outputs from the model are dependent on assumptions about many factors including yield and price that may vary significantly from those in the model.

Development costs are significant. They are amortised in the model.

Financial summary	Hops
Average yield/ha when at 100% production	1,742kg of T90 pellets
Average revenue per kg	\$36
Total revenue/40ha when at 100% production	\$2,508,480
Labour, garden & overhead costs/40ha	\$596,240
Cash operating surplus/40ha	\$1,912,240
Time to first harvest	Year 1
Time to 100% yield	Year 3
Time to cash positive	Year 1
Development costs/40ha	\$7,380,000
Life of plants	15 - 50 years

Hāpi also provides a financial feasibility model for a 40ha hop garden. This can be downloaded from [their website](#). It is more detailed than the model prepared for Venture Taranaki. The Hāpi model contains budgeted costs for:

- capital expenditure for land preparation, garden establishment and plant and equipment.
- operating expenses for garden management and associated processing and marketing.

Hāpi has advised that capex has increased by around 25% since their model was prepared. Other costs and revenue calculations are also likely to have changed so further investigation will be required to confirm the likely costs for any new development.

Payton also provides a case study for the MyFarm Investment Tapawera Hop Farm ([p25-27](#)). This gives costs and revenue for a development of 115 canopy hectares.

Recent advice received from Hāpi is that the optimal size for a new standalone development is 150ha (comparable in scale to the recent MyFarm Investments developments).

As such, a 100ha standalone development is probably viable and 40ha might be viable – although it should be noted that there are several examples in the South Island of hops farms as small as 20ha, on land that also has other revenue streams.



Assessing the options

– which variety should you grow?

There are many varieties of hops grown in New Zealand – some are varieties available internationally while others are New Zealand bred varieties only available in this country.

The New Zealand varieties bred by Plant & Food Research are generally controlled by Plant Variety Rights and are subject to licensing arrangements with NZ Hops. Some of these Plant Variety Rights are expiring soon while others, for more recently developed varieties, have many years to run.

As noted earlier, Hāpi is developing new varieties some of which will be licensed and some are intended to be released royalty free.

In addition to licensing matters there will be several factors that guide which varieties will be best suited to production in Taranaki:

- Driving the choice must be their suitability to market requirements.
- Some varieties will perform better than others in the soils and climate of the region.

As hops are not currently grown commercially in Taranaki it is suggested that production trials will be needed to determine which varieties may be suited to Taranaki and what management practices will be needed to enable commercial production.

Hop gardens normally grow a mix of varieties. Growing several varieties spreads risk and, as each variety is harvested at slightly different times, this enables the peak demand on labour, plant and equipment to be spread over a longer period.

Entry requirements

Developing new hop gardens is a capital-intensive process requiring suitable land and associated development costs. Establishing a commercial hops industry in a new region such as Taranaki also provides scale and related resourcing challenges.

Recent hop garden developments by MyFarm Investments in the Tasman District are over 100 canopy hectares and have involved capital investment of around \$30m. These developments are in a region where investment risk for hops is relatively low compared to Taranaki. In Tasman:

- The environment is known to be suitable for hops production.
- There is proven demand for hops from that area and routes to market through existing marketers of hops.
- There is ready access to skilled labour, contractors and processing facilities.

As a result of this lower risk, financing for large-scale hop garden development is available.

The downside for the Tasman District is that there is now little land available for further hop garden development. The suitable horticultural land is largely developed for hops or a range of other crops and is expensive compared to Taranaki dairy land.

While there are small scale plantings of hops in Taranaki, there are no plantings that have proven hops can be grown at commercial scale. It will be sensible for the first grower or growers considering commercial-scale production to carry out trial plantings and confirm how well hops grow, whether wind can be mitigated with shelter and whether hops with market appeal are produced.

Hop gardens generally use their own on-farm kilns for drying hops. This occurs immediately once harvested. Access to a suitable drying facility for any trial crop of Taranaki hops will be necessary to complete the production process and confirm the quality of Taranaki-grown hops.

Hāpi has advised that the capital required for the drying and associated processing facilities for a 150ha operation will cost in the vicinity of NZ\$8m. As a result of Covid-19 there are currently supply chain disruptions which may add further costs and delay orders for equipment.

Rather than the usual dedicated on farm hops drying facility it is possible that a drying facility shared with other food industries could be used for a Taranaki trial of hops.

Once dried, cool storage will also be needed. If pelleting and packing is required, the dried hops will need to be delivered to Nelson.

If a trial confirms that hops production is feasible in Taranaki then a larger commercial planting could occur perhaps with dedicated drying facilities.

Before proceeding with a large-scale development the access to suitable varieties and route to market for hops produced need to be confirmed.

Longer-term it will be ideal to have several hundred hectares operating in a new region such as Taranaki. This would enable a range of service providers to set up minimising risks and ensuring competition.

Establishing a hop garden – what's required?

Lincoln University have provided a report for Hāpi ["Suitability of New Zealand Cropping Regions to Support Hop Production"](#). This contains a very good summary of the requirements for hops and data on how various regions suit hops production. Those requirements are discussed further below. While that is the focus of the report, they also provide an overview of other important considerations which include:

- **"Availability of a work force:** Hops is a labour-intensive crop and it is vital that sufficient labour is available nearby, especially during peak times.
- **Cultivars:** A detailed understanding of which cultivars grow and ripen best in a given location will improve productivity.
- **Municipal infrastructure:** Setting up a horticultural enterprise from scratch requires public facilities, services and resources, such as access to water of suitable quality and electricity, roads and transportation, social infrastructure and public institutions (access to schools, towns, shopping, doctors, accommodation for staff).
- **Specialised infrastructure:** A hop yard requires facilities for storage, chilling, drying and processing (either onsite or nearby).
- **Market:** Another factor vital for site and cultivar selection is awareness of the market (who are the buyers and what do they want and need?).
- Understanding and knowledge of different trellis designs, layouts, and heights and how they interact with the growing requirements of various cultivars.
- Costs, including the price of land and establishment of the hop yard, and their impact on the profitability of hops production."

These are important aspects which will need to be considered in establishing a hop garden in Taranaki.

HOP GARDEN DEVELOPMENT

Developing a new commercial hop garden requires good planning and involves considerable capital expenditure.

As already noted, very good shelter will be a key requirement for commercial production of hops in Taranaki.

Artificial shelter is costlier but more effective and can be installed when it is needed. Natural shelter is cheaper but not quite as effective and needs to be planted and grown to suitable height ahead of planting hops. As hops grow to 5m in height and are particularly susceptible to wind damage they require taller and more robust shelter than some other horticultural crops. This additional height of shelter will also result in additional shade which impacts on the productive canopy area.

As hops have not been grown commercially outside of the Tasman and Nelson Districts for many years there is no experience in commercial production of hops in higher wind regions such as Taranaki. Shelter will require special consideration. Advice should be sought and other shelter developments assessed. It is noted that shelter has been installed for other crops in the region including for recent kiwifruit developments in South Taranaki.

Hops are grown on a trellis structure which also needs to be established before hops are planted. The Hāpi Guide for New Growers provides advice on trellis systems and planting density (p15). It notes that *"New Zealand uses the V-trellis system and gardens are generally 5 metres tall, with 2.5m row spacing... In New Zealand, typical plants spacing along a row is 1.2 metres."*

While this is how hop gardens are developed in the Tasman and Nelson Districts, other configurations are used elsewhere (see p15 of the Guide for New Growers) and may be better suited to Taranaki conditions.

Wild About Hops which sells hop plants to home brewers provides a [How to Grow Hops guide](#). It suggests a configuration of growing hops vertically for 2m and then horizontally along wires.

Determining the best configuration for a new and relatively windy region such as Taranaki will need investigation.

As noted above, it is likely that irrigation will be required to achieve optimal growth in Taranaki and is best to install as the garden is developed. Drip irrigation is the most efficient system but some gardens use overhead irrigation systems (p15-16).

New hops plants are usually planted in early spring after the threat of frost has passed. The Hāpi Guide for New Growers notes (p20) that *"some growers have had success with early autumn planting."*

Hop garden management

Hop garden management requires specialist skills and experience. The management option will depend on the skills and capabilities of the developer of the hop garden and the funding model that is chosen for development.

- The developer may already have suitable skills and experience
- Employing an experienced hop garden manager is another option
- Contracting specialist advice is also an option – most likely from the Tasman or Nelson Districts.

HOPS GROWING CYCLE

The Hāpi Guide for New Growers contains (p18) a typical growing calendar. It outlines the key activities over the annual cycle of production:





GROWING AND PROCESSING HOPS

The Hāpi Guide for New Growers also provides some further detail (p21-25) on the key activities that occur during the season:

- The new season's growth from hop plants occurs in early spring.
- New shoots are pruned back manually. This enables a "heartier second growth".
- Strings are put up, usually two per plant and in a V-shape with greater width at the top than the bottom. Nylon string is normally used in New Zealand.
- Shoots are then trained onto the strings – 2 - 3 bines per string, once the shoots are about 60cm high.
- The bines then grow up the string during the season – though some retraining may be needed.
- Flowering occurs during the summer with harvesting being carried out in late summer and early autumn.
- Monitoring of flowers occurs to ensure harvesting at the optimum time.
- Different varieties mature at slightly different times.
- Harvesting involves cutting bines at the bottom then at the top and being laid in a trailer.
- These are then taken to a picking machine which separates the flower cones from the rest of the plant.
- The cones are then dried in a kiln where heated air is driven by fans through beds of hop cones : *"Cones are usually dried for around 8-12 hours, typically at between 55°C and 65°C, to achieve a moisture content of 9-11%."*
- Hops are then baled (similar to a wool bale) and placed in cool storage.
- As noted above, Clayton Hops provides a good visual summary of [hops processing](#) including a video.
- Most hops are then sent to be pelletised.
- Pelletised hops are then bagged and stored at -1°C to -5°C for delivery to customers.

HEALTH AND SAFETY

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.

Hop gardens 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.

Growing conditions

The Hāpi report "[A Guide to Analysing Your Site](#)" provides very useful general information on analysing a site for growing hops. It suggests prospective growers should assess whether their site offers:

- High sunshine hours and long days during the growing season?
- Appropriately low winter temperatures?
- An adequate number of frost-free days?
- Growing season temperatures that aren't too high?
- Adequate water supply during critical growth periods of the season?
- High quality water?
- Shelter from wind and hail?
- Mildly undulating or flat terrain?
- Well drained, deep, sandy loam soil?
- Adequate power supply for picking equipment and kilns?
- Reasonable access for trucks to both bring in supplies and to transport hops off site after processing?

Lincoln University have also provided a report for Hāpi, [Suitability of New Zealand Cropping Regions to support Hop Production](#), which noted (p6) that sites should ideally:

"support a north-south row orientation with a northern aspect (to make full use of available sunlight)."

With respect to soils, the Hāpi Guide for New Growers additionally notes (p13):

"In general hops prefer rich alluvial soils or deep sandy or gravelly, well drained loam soil. Hop plants do not thrive in strongly alkaline or saline soils."

Hāpi also provides a "[Fertility Guide for Hops](#)" which notes that: "Hops are a high yielding plant with significant nutrient requirements. Hop plants are extremely efficient about taking nutrients from the surrounding topsoil; therefore monitoring and replacing depleted nutrients each season is crucial."

The Fertility Guide provides in-depth information on the testing to carry out prior to plantings and again during subsequent growing seasons. It notes "The majority of hop varieties prefer a slightly acidic soil, somewhere between 6.2 and 6.8."

The Fertility Guide also provides information on the balance of soil nutrients that are optimal for hops and advice on fertilisers.

While soils vary across Taranaki, the region has many areas with rich and slightly acidic well-drained volcanic loam soils which appear well suited to hops. Specific site analysis will be needed to confirm suitability of soils for hops.

The Hāpi Guide for New Growers also notes (p13): "To thrive hop plants need long day lengths, plenty of water, and protection from wind. Hops have specific chilling requirements and need a minimum amount of frost free days."

The day length requirement for hops is met in Taranaki. The Plant & Food Research "[Taranaki Land and Climate Assessment](#)" report notes:

"Hops grow vegetatively with increasing day length, and then flower when the days become shorter. However, a critical day length must be met before flowering is triggered. This varies between cultivars but is generally considered to be a day length of 15 hours, including an allowance for twilight. We consider days with 14 hours between sunrise and sunset plus 1 hour of twilight to be above this threshold. Since the only factor that influences maximum day length is latitude, it is generally considered that anywhere between 35° and 55° in latitude is ideal for hops, provided the land is suitable for horticulture in general. All of New Zealand except for the very top of the North Island lies within this range, and Taranaki in particular experiences 90–94 days per year with day lengths of 15 hours or greater."

The Hāpi "Guide to Analysing Your Site for Hops" notes (p13) with respect to wind: "Hops are sensitive to wind and exposure to strong wind, particularly at certain stages of the growth cycle can cause significant damage and impact quality and yield. Leaf damage and the loss of cone bearing laterals can occur, having an impact on overall plant health and yield. After flowering has occurred, exposure to hot wind, can cause damage and impact cone quality. Sites that are naturally protected from the wind are ideal; however, shelterbelts or windbreak fencing systems can be used to reduce the impact of wind."

The Lincoln University report notes (p18) that "Hops are susceptible to wind damage and exposure to strong winds can cause damage to leaves, bines and cones, which can lead to fungal (esp. *Fusarium*) infections."

The Land and Climate Assessment report also comments on wind. It notes:

"The majority of hops in New Zealand are grown in Motueka, which has an average daily windrun of 120 ± 27 km. We know from in-house experience that Marlborough, with an average daily windrun of 291 ± 66 km, is too windy for hops. Taranaki would appear to be too windy for hops, as there is considerably more wind than Marlborough. Wind mitigation such as shelterbelts, or growing hops on shorter trellises may potentially help, although the windier coastal regions of Taranaki may still be too windy despite this."

The Land and Climate Assessment report notes mean daily windrun for various locations in Taranaki:

- Urenui 370km
- New Plymouth 489km
- Inglewood 382km
- Stratford 347km
- Ōaonui 509km
- Hāwera 415km
- Waverley 422km

This data on windrun suggests Taranaki is much windier than the Tasman District. While there may be more sheltered locations in Taranaki with lower wind run it is apparent that controlling and reducing wind will be a significant challenge for growing hops at commercial scale in Taranaki.

Lincoln University noted (p18) that hops do however, require some air movement through the garden to reduce the risk of fungal diseases occurring.

With regard to winter temperatures the Hāpi Guide for New Growers notes that:

"Hop plants need winter low temperatures below 4 °C for at least six weeks⁶ in order to enter dormancy and prepare for growth and flowering in spring. Inadequate chilling can result in weak and erratic spring growth."

The Land and Climate Assessment Report did not assess Taranaki's climate in regard to the specific winter chilling requirements for hops. The report did note some generic comments on winter chilling:

"Winter chilling is important for flowering crops as they need to be dormant for a sufficient period over winter to induce flowering in spring. We consider 500 chill hours of 7 °C or below, between May and September, to be sufficient for general horticulture."

The Land and Climate Assessment report notes P11) mean chill hours of 7 °C or less for various locations in Taranaki:

- Urenui – 719 hours

- New Plymouth – 658 hours
- Inglewood – 946 hours
- Stratford -1227 hours
- Ōaonui – 721 hours
- Hāwera – 941 hours
- Waverley – 961 hours

This measure of chill hours of 7 °C or less used in the Land and Climate Assessment report is different to the measure of chill hours of 4 °C or less used in the Hāpi Guide for New Growers

Further investigation will be required to determine if a particular site meets the chill hours requirement for hops. There may be some inland parts of Taranaki that meet this winter chilling requirement but coastal parts of Taranaki appear unlikely to⁷.

The Hāpi Guide for New Growers also suggests a requirement for hops of 120 frost free days for flowering. This is easily met at all sites across Taranaki reported in the Land and Climate Assessment report. All had over 300 days frost free. While there are occasional out of season frosts, and some inland locations more susceptible to frosts than other locations, these are very unlikely to impact on the flowering period for hops.

Hops are a crop that is sensitive to hail damage during the growing season. Hail is an intermittent risk across Taranaki though its specific occurrence is largely random.

Hops also require a good supply of water. The Hāpi "Guide to Analysing Your Site for Hops" suggests *"The typical water requirement for optimal hop growth is frequently cited as 30mm of water consumption per week during the period of vegetative growth. This can however vary significantly based on other factors such as the evapotranspiration at each location."*

This requirement for 30mm per week will not be met from rainfall consistently in Taranaki. It is likely that additional water will be required for optimal growth of hops in the region. The quality of water supply to a specific site is also an important consideration.

While hops require a good supply of water, Lincoln University noted (p12) that *"hops are susceptible to a range of mildews and blights. This makes growing them successfully in some (humid) regions particularly challenging or impossible."*

The conclusion from the information provided is that hops will require careful site consideration in Taranaki – particularly with respect to receiving suitable winter chilling and being able to be protected from wind. Access to water for irrigation will also be important.

⁶ In the Hāpi "Guide to Analysing Your Site for Hops" it is noted (p10) that while the need for this level of winter chilling has been commonly accepted it has been questioned in a recent US study. The Lincoln University report in turn questioned this US study (p6) and suggests winter chilling of 30-60 days with temperatures below 4°C is needed.

⁷ The Lincoln University study ruled out New Plymouth as it did not meet the winter chilling requirements. It was also too windy without shelter.

Labour considerations

Once established there are three key labour-intensive activities in a commercial hop garden:

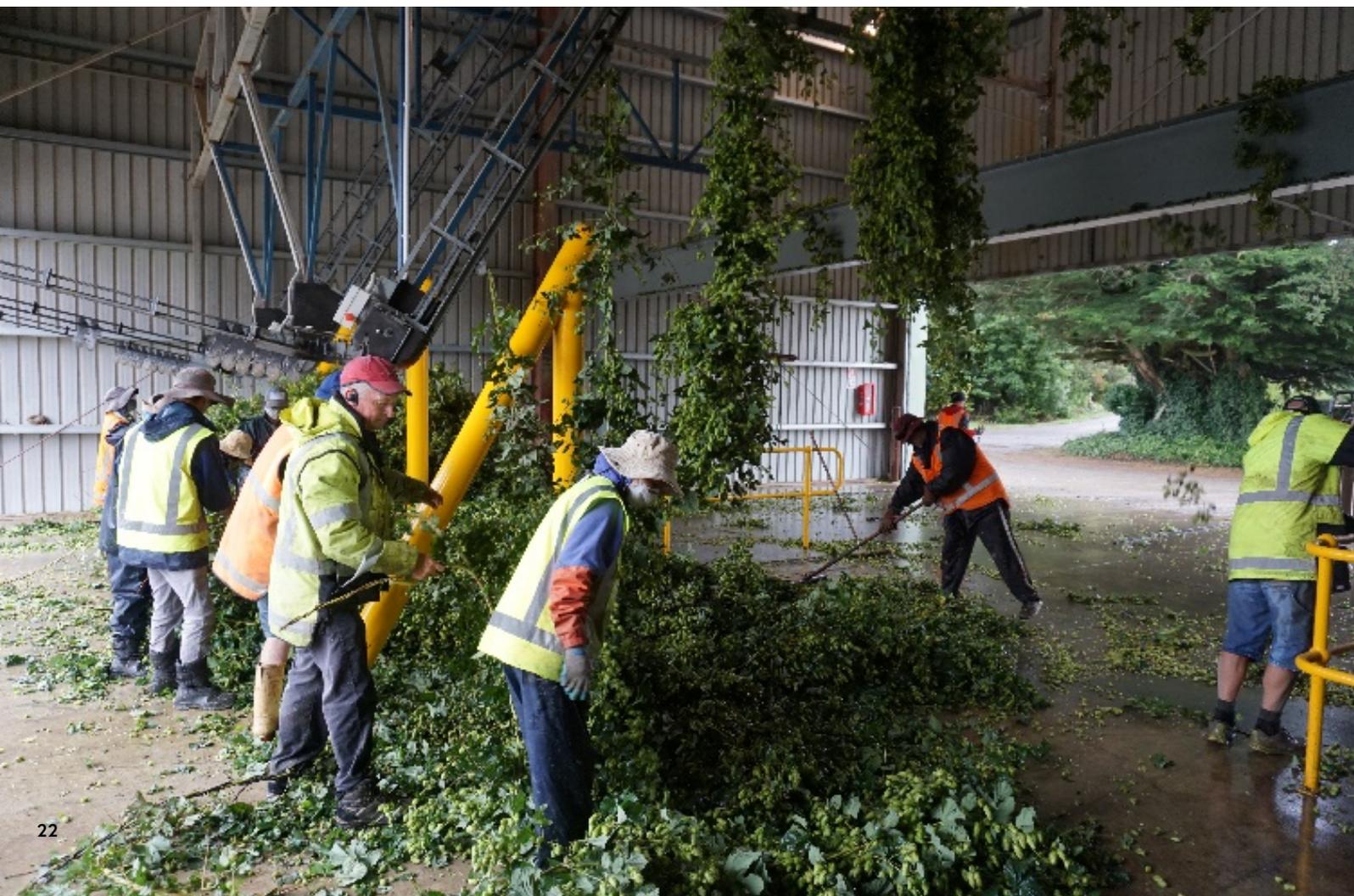
- Putting new strings throughout the garden – carried out in late winter or early spring.
- Selecting the bine to grow and training them on the strings – carried out from late October and into November.
- Harvesting – which takes place from the end of February through to the first days of April, depending on variety.

As an indication of the scale of labour requirements for a commercial scale hop garden, Hāpi has advised that:

"A 150 Ha operation would likely require ~12 FTEs year-round; ~14 additional FTEs from Jul-Aug for stringing; ~18 additional FTEs from Oct-Nov for training; ~30 additional FTEs from late Feb - early April for harvest."

Accessing suitable labour for these periods will require careful consideration. Coordination with the developers of other horticultural crops being considered in Taranaki may be necessary.

It is possible the [Recognised Seasonal Employer Scheme](#) which brings labour from some Pacific Islands into New Zealand may need to be considered.





Environmental impact

The Hāpi Guide for New Growers

"Disease pressure is generally considered to be low in New Zealand, as the country is largely free of the major diseases and pests that afflict the majority of hop growing regions around the world. This allows growers in New Zealand to grow without the use of sprays.

Pest pressure in New Zealand is also low. The two-spotted spider mite is the most significant pest faced by hop growers.

The two-spotted spider mite feeds on leaves, which can negatively impact both quality and yield. Spider mites thrive in hot, dry conditions, but can be managed. These are typically controlled using predator mites."

This disease-free status is a significant advantage for New Zealand hops growers.

New Zealand's distance from key international markets and the accompanying emissions involved in delivering product to customers will likely be an issue that will become increasingly important.

Growers will need to consider the carbon footprint of their full value chain and take steps to mitigate or off-set emissions.

REGULATORY CONSIDERATIONS

New growers need to consider issues such as resource management constraints, water supply and discharges including to the air during the drying process. A hop garden will need to meet the requirements of the local Council's District Plan and obtain consents from the Regional Council for the use of water for irrigation and for 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.

Potential for the region

WHAT A HOPS INDUSTRY IN TARANAKI LOOKS LIKE

Based on the financial model prepared for Venture Taranaki, a development of 150 canopy hectares of hops would potentially:

- Yield 261,300 kg of T90 pellets.
- At an average price of \$36/kg produce revenue of \$9.41m.
- Produce a cash operating surplus of around \$7.17m.
- Employ around 12 FTE year-round and additional FTEs for seasonal work⁵.

A 150 canopy hectare development of hops would have significant economic impact and would also encourage the development of the local craft brewing industry. Taranaki is home to at least five commercially-focused craft breweries, with multiple award-winning offerings, and numerous local home brewers.

The craft breweries include:

- [Three Sisters](#)
- [Shining Peak](#)
- [Mikes](#)
- [Forgotten 43 Brewing](#)
- [Theoretical Brewer](#)

There is a particular opportunity for local craft brewers to get involved in the development of the hops industry and, provided the quality is high, to develop beers incorporating local hops.

Outside of Taranaki, New Zealand has over 250 craft breweries. Many of these will be interested in exploring the use of hops from a new region. There is good opportunity to test demand and trial locally grown hops with these local and national brewers before exploring export markets.



⁵ Discussed further in Section 14 Labour Requirements

Next steps

With no existing hops industry in Taranaki there are limited local specialist resources, and it is likely advice will need to be sought from the Tasman and Nelson Districts.

Feilding-based MyFarm Investments has packaged two syndicated hop garden developments:

- Tapawera Hop Garden Limited Partnership – this is a [106 canopy hectare development](#) with a total asset value of \$28.75m.
- Wairua Hop Garden Limited Partnership – this is a [115 canopy hectare development](#) on a former 175ha dairy farm. The hop garden has a total asset value of \$32.8m.

Both developments have license, garden development and management, and hop supply agreements with Hop Revolution.

MyFarm noted *"Wairua is believed to be one of the last large scale developments likely to occur in the favoured Nelson region; further hop garden developments are likely to be smaller or located outside of this 'home of hops' region."*

Once the risks of hops development in Taranaki are reduced through trials, an investment company may be interested in opportunities in Taranaki.

Hop Revolution [says](#) they "are actively assessing other properties and working on new developments".

There will likely be interest in hops grown in new regions from craft brewers throughout New Zealand and offshore who are looking for a point of difference. Taranaki brewers will perhaps have the greatest immediate interest.

FUNDING OPPORTUNITIES

The source or sources of funding for development of a hop garden 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 hop opportunities and providing loans for developments.
- Hop developments may also be funded by the landowner – perhaps using equity and cashflow from an existing farming operation that continues in conjunction with the hop garden development.
- There are also developments part-funded by syndicators where equity is provided from multiple investors.
- 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.

CHECKLIST AND ACTION GUIDE FOR INTERESTED INVESTORS

If you are a/an:

- Taranaki landowner – with 50+ hectares suitable for a hop garden development.
- Hop grower – with an interest in diversifying into Taranaki.
- Investor – with an interest in supporting new hop garden 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

The [Hāpi website](#) has a wide range of [resources](#) including:

- The [Hop Industry Guide for New Growers](#)
- A [Guide to Analysing Your Site for Hops](#)
- Their [Financial Feasibility Model for Hops](#)
- Lincoln University's report [Suitability of New Zealand Cropping Regions to Support Hop Production](#)
- Grant Payton's report [Beyond the borders of Nelson: The opportunity for growth of the New Zealand hop industry](#)
- [New Zealand Hops](#)
- [Freestyle Hops](#)
- [Hop Revolution](#)
- [Clayton Hops](#)
- ANZ's [Craft Beer Insights](#) report
- [Brewer Guild of New Zealand](#)
- [Brewers Association of New Zealand](#)
- The Plant and Food report "[Taranaki Land and Climate Assessment](#)"

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

Appendices

APPENDIX A: THE HISTORY OF HOPS IN NEW ZEALAND

In Europe, the flowers of the hop plant have been used during the past thousand years or so to provide bitter flavours, a range of aromas and stability to beer. Hops have become integral to beer production.

With that long history in the beer industry the hop plant was, not surprisingly, an early introduction to New Zealand and was first grown by German and English settlers in Nelson in 1842.

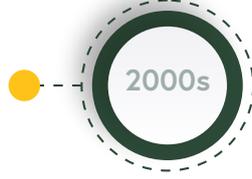
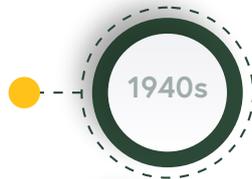
While hops can be grown across New Zealand, they grow particularly well in the Tasman and Nelson Districts with their combination of mild summer temperatures, winter chilling, regular rainfall, high sunshine hours and relatively light winds.

During the 20th century hop cultivation became concentrated in the Tasman and Nelson Districts and growers from there supplied hops to breweries across New Zealand.

During the 1940s the imported varieties of hops then being used developed problems with *Phytophthora* root rot. In 1947 the Department of Scientific and Industrial Research established a hop research station at Riwaka, near Motueka. It began developing new varieties of hops suitable for New Zealand conditions.

By 1980 the New Zealand beer and hops industry had consolidated into just two brewers – Dominion Breweries and New Zealand Breweries, and one local hops supplier – the Hop Marketing Board. The craft beer industry was developing in other countries and, in 1981, the first modern-era craft brewery was established in Nelson – McCashins. The development of the craft-beer industry (internationally and in New Zealand) has helped drive demand for new varieties of hops.

The hop industry was deregulated in 2003. The Hop Marketing Board evolved into grower co-operative company NZ Hops which remains the largest marketer of New Zealand grown hops. Several other independent companies have since begun marketing hops. The Hop Research Centre became part of Government-owned Crown Research Institute Plant & Food Research. The New Zealand craft brewery industry has developed rapidly and there are now over 250 craft breweries.



As the 19th century progressed, breweries, often with associated hop gardens, were established throughout New Zealand.

Hops were [tried in Normanby](#) in South Taranaki during the 1880s but the trial was abandoned after damage from strong winds.

The Hop Marketing Board was established by the New Zealand Government along with a monopoly on hop marketing. It set up long-term contracts with the major breweries.

From the 1960s mechanised picking of hops developed reducing labour requirements. New varieties of hops were developed and grown including seedless varieties with improved and stronger aroma and bitterness characteristics. These varieties were more productive but lesser quantities of hops were needed to produce the same result. The local market became oversupplied so, by the 1970s, hop exports were developed.

New Zealand was exporting hops in significant volumes by the mid-1990s – around 80% of local production.

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.



Taranaki's Regional Development Agency

25 Dawson Street, PO Box 670
New Plymouth 4340, New Zealand

T+64 6 759 5150

E info@venture.org.nz

venture.org.nz