Farm Ventures and Fruition - Climate and Soil Assessment for Taranaki Kiwifruit

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Taranaki Region Physical Description

The Taranaki region consists of approximately 7,300 km^2 on the west coast of the lower North Island. The landscape is dominated by Mount Taranaki, a volcano that has impacted significantly on the original landform and the soils of the region. The regions primary production is focused on dairying, with some dry stock farming on less quality land and approximately 63 hectares planted in horticultural crops, specifically avocados, other subtropical crops, nuts, and potatoes[1]. The main residential centre, New Plymouth hosts 58,300 of the total 119,600 people living in the region. Other, smaller communities are scattered around the base of Mount Taranaki with Stratford and Hawera the other largest communities.

Taranaki is some 300 kilometres from the main kiwifruit and avocado growing region of New Zealand, the Bay of Plenty. While the region has a regional port, there is currently no infrastructure at the port for the shipment of either kiwifruit or avocados, though this could be developed with further progression. Land has been developed into kiwifruit and packhouses to pack the fruit in the 1980's. The kiwifruit was removed after the difficulties caused by Cyclone Bola (1988) coinciding with the difficulties the industry was facing in the market at that stage[2]. This was also prior to the establishment of Zespri. The orchards commonly had pine tree shelter and the vines were grown that tall that hydraulic cherry pickers had to be used to harvest them, which made them extremely vulnerable to wind. Thirty more years of experience has been worth a lot for the current improved infrastructure development and performance.

Since that time, nationwide packhouse and cool store facilities have amalgamated or closed down to the extent that there are few packhouses packing fewer than 3 million trays. The land area in kiwifruit to support this development, assuming a mix of green and gold production is around 300 to 350 ha though there is a small one already established in Whanganui. There is currently a total of 74 ha of Green and 1 ha of Gold kiwifruit in the Lower North Island[3] which includes Whanganui and Levin, and a further 60 ha being developed in 2020-21 at Whanganui and south Taranaki. Until this production base is established, it is confirmed that the fruit is carted to the Bay of Plenty for packing and storing.

Across the horticultural industry, labour shortages have been a major issue. Despite the size of the population, there are only approximately 6,000 people (5.2%) of the working population of Taranaki, registered as unemployed in 2019[4]. However, due to recent events with Covid-19 impacting the economy of New Zealand and Taranaki, there had been a 20% increase of people on the Jobseeker benefit in Taranaki compared to this time last year, which means around 10,000 people are looking for employment[1]. Diversification into significant areas of horticulture will require programmes to attract those registered as unemployed, the movement of workers from other industries (eg petrochemical industry) or use of Recognised Seasonal Employer scheme (RSE). The RSE scheme is a government scheme allowing Pacific Islanders short term visas to help fill the shortfall in local seasonal labour

[1] Fresh Facts 2019, Plant and Food Research ISSN 1177-2190

[2] Pers comms, Joe Clough, PGG Wrightson Consultant

[3] Zespri Annual Report 2020

[4] Ministry of Business, Innovation and Employment. https://www.mbie.govt.nz/dmsdocument/11453-regional-factsheet-taranaki-pdf

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supply. This scheme has been impacted by Covid-19 quarantine requirements. In 2019, 2% of Taranaki's workforce were migrant or seasonal workers. The development also may provide opportunities for existing contractors to work alternatives times of the year, and for horticultural education in the region to be established with Fruition Horticulture BOP.

Elevation

In the Bay of Plenty elevation can be a factor limiting production, the higher the elevation the colder and wetter the site. Properties above 200 metres above sea level (masl) are considered too high in elevation to successfully grow kiwifruit, and for those at approximately 120-200 masl the effects of their elevation effect a limitation to production. The impact of management has a large effect on all operations.

Aspect

The aspect of the land is critical. Ideally land that faces north will be warmer as it received sunlight throughout the day. Land sloping towards the north, northeast or northwest provide the best conditions for both plant growth and also the drainage of cold air from the site, resulting in reduced frost risk.

Soils

The soils in the area are dominated by Allophanic soils. These are soils formed from volcanic ash. The most common name given to these soils is New Plymouth Black Loam. At higher altitudes, these soils can be impacted by the bouldery lahars that can impede drainage and use of cultivation equipment. At lower altitudes this is not a problem and the lower altitude soil typically present no limitations to horticultural production.

One reference, written in 1988, comments that "they are possibly the largest group of soils with high potential productivity for various forms of cropping and horticulture….the Taranaki agricultural community has only recently begun to recognise the versatility of the New Plymouth soils."[5] They are free draining but also have a reasonable water holding capacity due to the naturally high organic matter content. Their main limitation is their potassium retention and relatively low nutrient levels generally, limitations that can be overcome by regular fertiliser applications suitable to the soil testing. These soils have similar characteristics to the soils of the Bay of Plenty areas successful at growing kiwifruit.

Other soils identified on the map such as Brown Soils, Gley Soils, Organic Soils and Recent Soils are likely to have limitations for horticultural production and should be avoided when farms or areas within farms are considered.

The colours in Figure 1 make it difficult to differentiate the allophanic from other soils (allophanic soils are the yellowy-green). Site specific investigation is necessary.

[5] Soils in the New Zealand Landscape, https://nzsss.science.org.nz/app/uploads/2016/04/soils_in_the_new_zealand_landscape_Chapter-4.pdf

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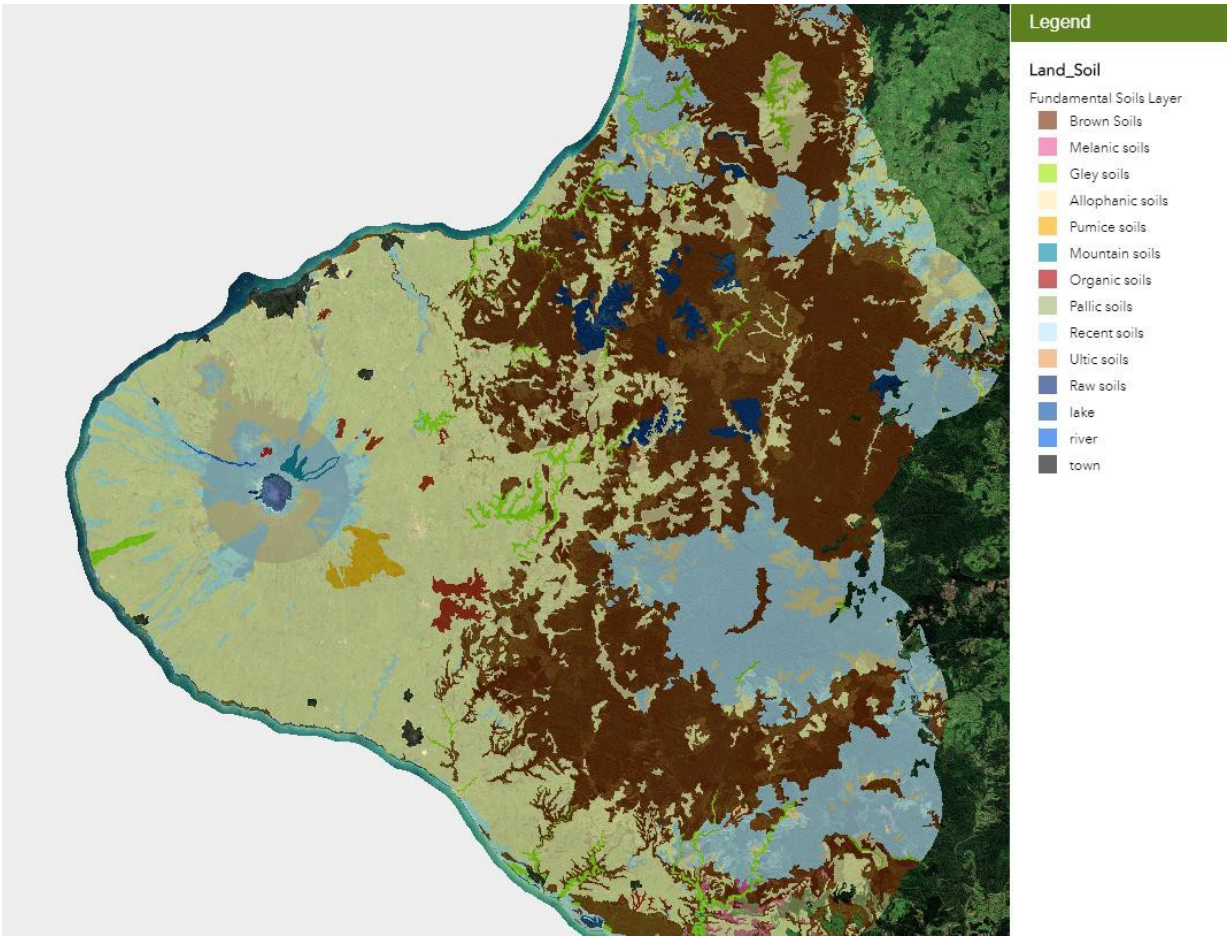

Figure 1: Land Cover and Soil Map of Taranaki. Taranaki Regional Council[6]

Climate[7]

Although the Taranaki region is one of the windiest regions of New Zealand, it is generally sunny with a good amount of evenly spread rainfall. Microclimates exist within the region, particularly where protection is afforded from the prevailing wind, which is a further aspect of site selection.

Rainfall

Rainfall in the region is significantly impacted by the elevation and the exposure to the rain-bearing northerly and westerly winds with most of the higher northern areas of the Taranaki region experiencing over 2,000 mm per year. Areas closer to the coast receive less rain with the New Plymouth airport averaging 1,400 mm per annum. The annual variability is similar to that of most locations on New Zealand's west coast, being impacted by the state of the southern oscillation index (ie El Nino or La Nina). This level of rainfall on the coast is very similar to the Bay of Plenty. Annual rainfall of Hawera is 1141 mm, Normanby is 1195 mm, Patea is 1659mm. Typically the higher the altitude is the higher rainfall levels such as Stratford at 2022 mm.

[6] https://maps.trc.govt.nz/LocalMapsViewer/?map=0824911d3f58406dbab44cfb8dde6ae6

[7] The Climate and Weather of Taranaki, P.R. Chappell – 2nd edition

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Table 1 Average Monthly and Annual Rainfall for Taranaki Region and Tauranga

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Hawera	76	73	83	83	98	120	119	99	94	110	94	92	1141
Stratford	122	132	140	146	172	196	208	190	181	218	152	165	2022
Patea	121	91	114	132	148	158	173	149	138	154	163	119	1659
Normanby EDR	63	77	82	102	93	116	128	108	104	128	120	74	1195
New Plymouth	93	96	98	116	126	148	136	127	120	125	104	121	1409
Tauranga	78	86	97	121	110	115	129	110	85	89	74	95	1189

Figure 2 provides a graphical representation of the level of rainfall across the Bay of Plenty and Taranaki. They indicate higher levels of rainfall with higher elevation. The coastal strip of both regions experiences lower levels of rainfall, levels more suited to the crops under consideration.

A wet day is defined as a day when 1 mm or more of rain has fallen. At the Stratford weather station, there are 147 wet days in a year, and both New Plymouth and Hawera had 142 wet days. This is compared to Tauranga which has an average of 112 wet days annually. Also the frequency of wet days is higher over winter months and but is also significantly higher in the spring when pollination is occurring.

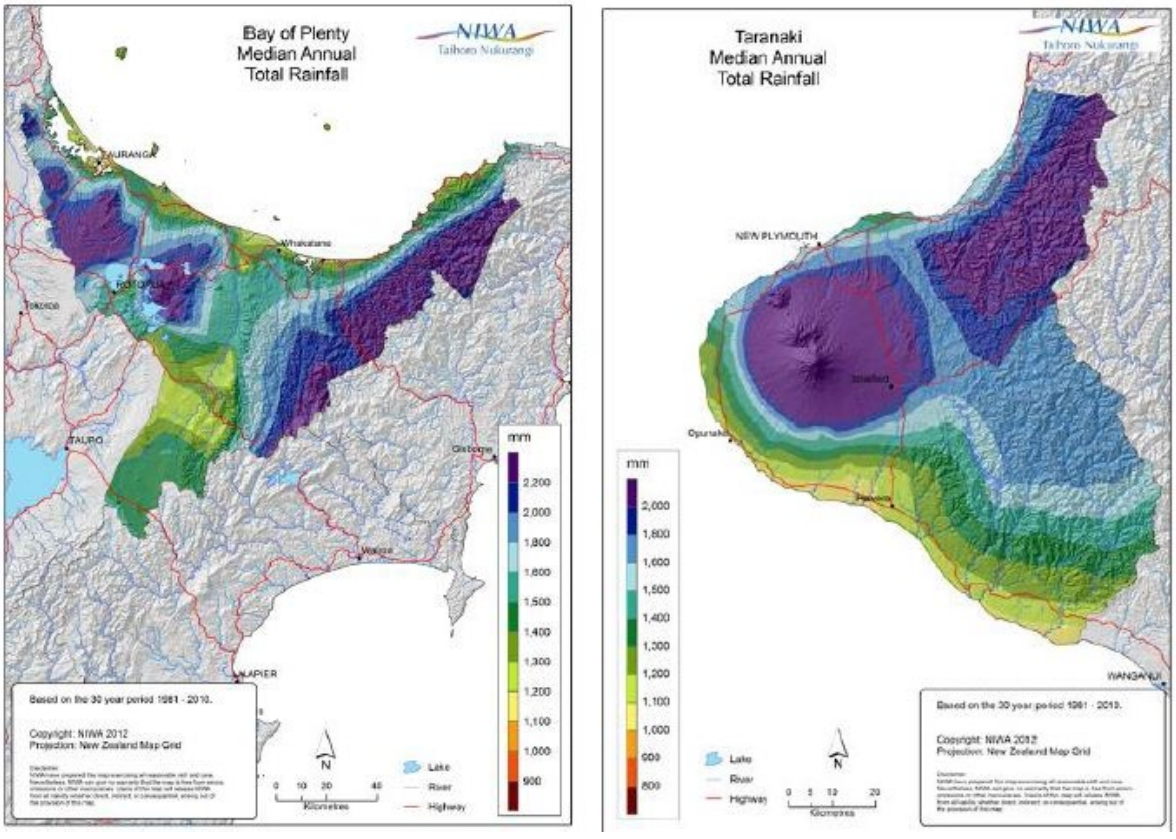

Figure 2: Rainfall Maps for Bay of Plenty and Taranaki 1981-2010, NIWA

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Figure 3 highlights the distribution of monthly rainfall for the New Plymouth and Tauranga weather stations. Highest range, lowest range, 10th percentile, 90th percentile and mean show the distribution of rain for each month. Generally, both regions follow a similar average trend, though the highest monthly peaks differ.

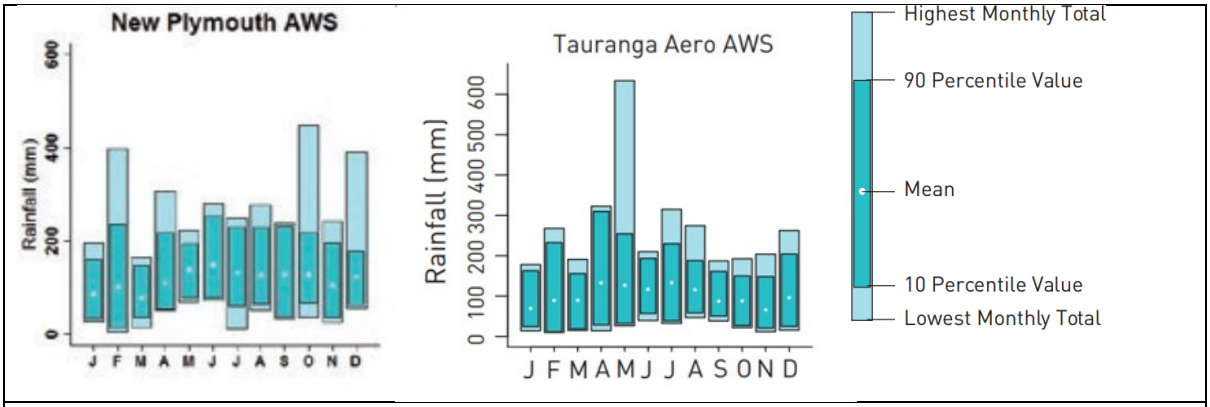

Figure 3: Monthly Rainfall Variation, NIWA

Historically it is not common for Taranaki to experience drought. Average soil moisture deficit for New Plymouth is 181 mm and peaks in January and February with averages of 60 mm and 51 mm, respectively. Usually, there is an average of 1.4 dry spells each year, or periods of 15 days with less than 1mm of rain, in Taranaki. The extreme dry of the 2012/13 season resulted in serious moisture deficit of up to 130 mm. This drought would have meant that there was no available soil moisture to support plant growth. In a year such as this, irrigation would be needed to support plant growth. Table 2 provides detail of the typical soil moisture deficit that New Plymouth typically experiences and the average evapotranspiration (ET), an estimate of the movement of water through the plant.

Typically a kiwifruit grower plans to replace ET with irrigation which would mean the requirement of 4.68 mm per day irrigation at the peak, equivalent to 46 cubic meters of water per hectare per day during a very dry period of multiple soil moisture deficits.

Table 2: New Plymouth Soil Moisture Deficit and Evapotranspiration

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Number of Days Runoff	1	1	0	2	6	12	12	11	8	4	2	1	58
Average Runoff	3	14	2	26	64	115	104	86	71	51	20	18	577
Number of Days of Soil Moisture Deficit	12	12	9	2	1	0	0	0	0	0	3	5	44
Soil Moisture Deficit	60	51	31	4	2	0	0	0	0	0	11	22	181
Evapotranspiration	145	120	100	59	37	27	30	43	60	90	117	130	958
Evapotranspiration per Day	**4.68**	**4.25**	**3.23**	**1.97**	**1.19**	**0.90**	**0.97**	**1.39**	**2.0**	**2.90**	**3.90**	**4.19**	

Temperature

The Taranaki region experiences warm summer temperatures of around 20 – 22°C daily average

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maximum temperature. The average daily temperature range is only 7.4°C, narrower than the main growing regions of New Zealand. The average daily temperature range temperature for Tauranga for example is 8.4°C which is only 1 °C difference. The mean daily temperature for New Plymouth is 13.6°C compared to a mean daily temperature of 16°C in Tauranga.[8] Any global warming effects will lift Taranaki temperatures closer to the Bay of Plenty's.

Similar to the rainfall figure, Figure 4 shows temperature variation, the highest range, lowest range, 10th percentile, 90th percentile and mean temperature for New Plymouth and Tauranga. The trends again, are very similar between the two areas.

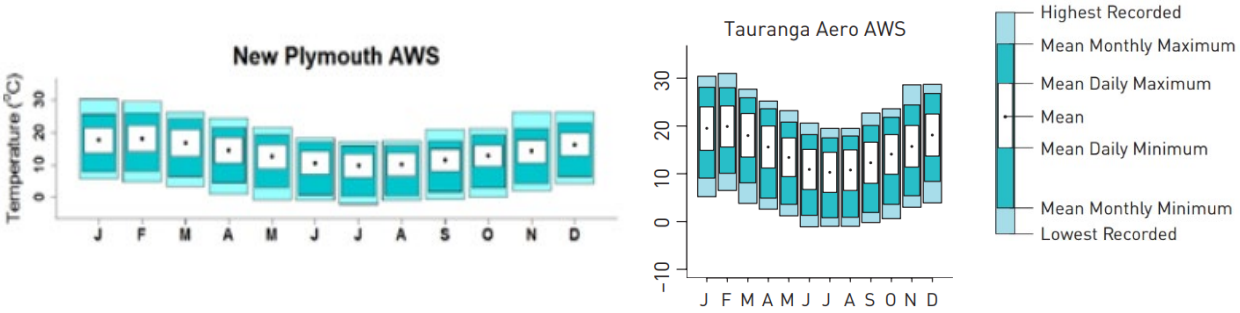

Figure 4: Monthly Air Temperature Variation, NIWA

An average of 8.5 ground frosts and 1.3 air frosts occur per winter month. These air frosts can be quite damaging to immature fruit and emerging spring growth, causing crop loss or reduced production. If air frosts are being experienced in September, it is likely that frost protection would be required for any kiwifruit development. This requires up to 3 mm of irrigation per hour for the duration of the frost or 30 cubic metres per hour per hectare. Depending on access to water and the volumes available, this may require the storage of water on site.

Wind

A wind rose is a pictorial representation of the wind patterns of a region. The colours show the mean annual frequency of surface wind speeds; (ie red being wind speeds of 1-20km/hr). The direction shows where the wind has come from Tauranga, New Plymouth, Hawera in Figure 5, highlights best the prevailing west to southwest wind direction.

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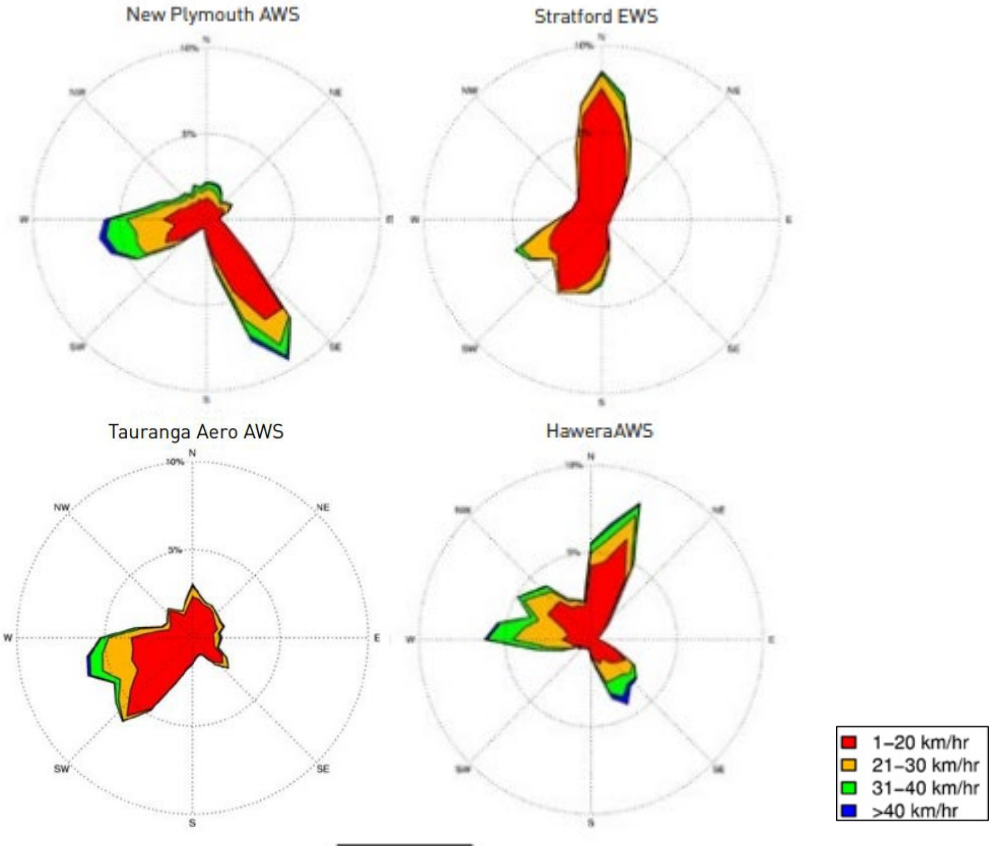

Figure 5: Wind Roses for New Plymouth and Tauranga, NIWA

The wind rose for Tauranga shows relatively low levels of wind, whereas the wind rose for New Plymouth stations show significant wind from both the west and south-westerly direction. The winds from the south-west in North Taranaki are caused by the deflection of wind off Mt Taranaki and also the cold air (katabatic wind) draining off Mt Taranaki to the east. These cold winds can impact on the growth of kiwifruit vines, limiting the accumulation of fruit dry matter - a key factor in fruit payments from Zespri. Also, there are frequent winds from the north, south west in Stratford, and gusty frequent winds from the north to north-east, west, and southeast in Hawera. The establishment of shelter, with natural and artificial, will be essential in the successful development of this site. Depending on the sites selected, there may be a requirement for overhead shelter to limit the impact of the strong and frequent winds. Overhead shelter if required in any region is not only expensive but also introduces other management complications such as managing beehives during pollination.

Solar Radiation

The solar radiation in the location is a driver of fruit dry matter which drives higher fruit payments in kiwifruit. Table 3 is a summary of the available data. It shows very little difference in the mean daily solar radiation for New Plymouth, Normanby and Tauranga. There is insufficient data in New Zealand around the impact of solar radiation and kiwifruit growth. The lower levels of solar radiation in September and October, potentially limiting vegetative growth at a key time, which may be crucial to the success of any development.

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Table 3: Average Solar Radiation (MJ/m2/day)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
New Plymouth Average	24.0	21.2	16.9	11.6	7.8	6.2	7.0	9.8	13.4	17.3	21.6	22.2	14.9
Normanby Average	22.4	19.8	15.5	10.6	7.3	5.6	6.7	8.8	12.4	16.2	20.1	21.9	13.9
Tauranga Average	23	20	17	12	8	7	7	10	14	18	21	22	15

To add some context to the solar radiation data, Growing Degree Days (GDD) and sunshine hours can also be analysed. Figure 6 provides a comparison of these parameters across New Zealand's significant growing regions. New Plymouth has greater number of growing degree days than Nelson and Rotorua and has a slightly higher number of sunshine hours than Hamilton in the Waikato.

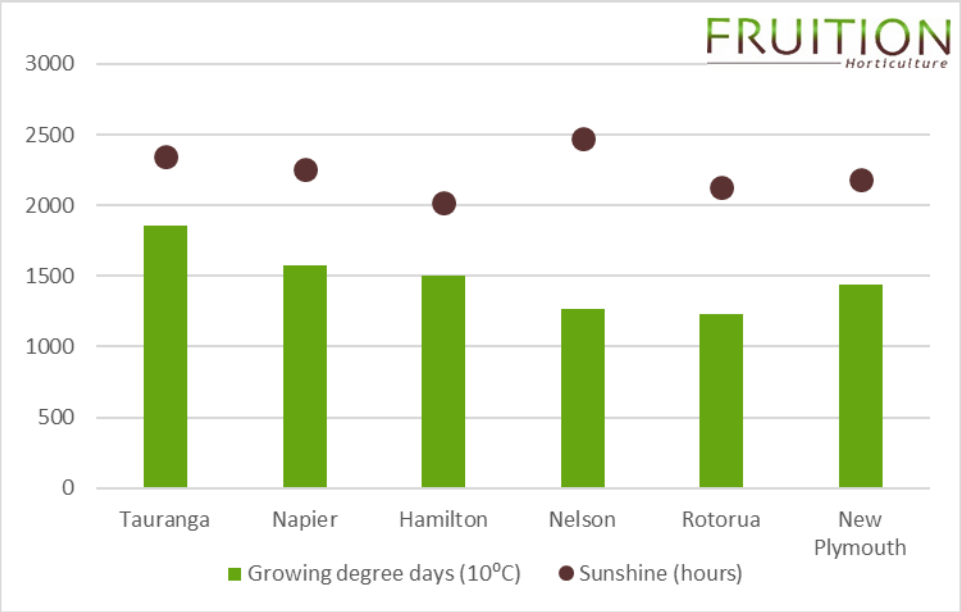

Figure 6: Comparison of Annual GDD and Sunshine Hours for the growing regions of New Zealand

Climate Change

Climate is a significant driver of a regions ability to grow certain crops well over time. The effects of climate change are continually measured, and projection models are used to forecast 'likely' changes. It is important to understand how the Taranaki climate may change into the future. The Ministry of the Environment has summarised the projections in Table 4.

The region is forecast to be 0.7 – 1.1°C warmer by 2040 and 0.7 – 3.1°C warmer by 2090. This is likely to benefit kiwifruit production. Warming in other areas of the country where kiwifruit is grown may cause production impacts by lack of winter chill – a factor necessary for the successful production, particularly of the traditional green Hayward variety.

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Any horticultural development must be aware of the potential risks of increasingly stronger tropical cyclones and heavy rain and wind events. These are considered in the financial section of assessment by using conservative yield estimates in a sensitivity analysis.

Table 4: Likely Climate Change Impacts by Season for Taranaki

Spring	• 0.6°C to 2.7°C temperature rise • 2 per cent less to 3 per cent more rainfall in New Plymouth
Summer	• 0.6°C to 3.3°C temperature rise • 1 to 2 per cent more rainfall in New Plymouth
Autumn	• 0.7°C to 3.2°C temperature rise • No change to 4 per cent more rainfall in New Plymouth
Winter	• 0.7°C to 3.1°C temperature rise • 5 to 9 per cent more rainfall in New Plymouth

These changes if they occur could have the following impacts on horticulture in Taranaki:

- Increased coastal erosion presents a risk to roads and infrastructure.
- Increased time spend in drought, which increases dependence on irrigation and leads to water shortages.
- Warmer temperatures would give a longer growing season and opportunities to grow new types of crops.
- New pests and diseases could present themselves to the industry. Even a slight increase to temperatures will create better conditions for serious pests to thrive.
- Strong and more frequent tropical cyclones and heavy rain and wind events could negatively impact on horticultural production.

Pests and Diseases

Kiwifruit is susceptible to a range of pests and diseases for which there are sound management strategies for existing known causes. The recent incursion of the vine killing disease *Pseudomonas syringae pv Actinidiae* (Psa) is an example of how primary producers need to be ready for the next incursion and have planning in place as an industry and individually to manage the consequences of the next incursion. Diversified regional supply could be beneficial for biosecurity.

Kiwifruit

Green

This is the traditional green fruit that has been grown, predominantly in the Bay of Plenty, for decades. New Zealand supplies approximately 65 - 90 million trays of this variety of kiwifruit annually. The green Hayward variety has shown good tolerance of Psa. This is the only variety that is not protected with a Plant Variety Right (PVR) and therefore Zespri is unable to control domestic or international production.

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The average Orchard Gate Return (OGR) per hectare for this cultivar has increased as total New Zealand production plateaued, and the global market mix improved which has helped to counter increased costs and foreign exchange pressures. However total production in 2018 was high which will reduce OGR, although less than occurred in 2016. The Orchard Gate Return is the income received at the orchard gate, which can be used to cover the growing and harvesting costs and overheads such as debt servicing and rates.

Conversion of green orchards to Gold3 (Sun Gold) is helping lift green returns as production plateaus and more of the fruit is able to be directed to the higher returning markets. However, Zespri is concerned green production may fall below a critical mass if national area falls to below about 5,000 hectares.

A key driver for OGR per hectare is yield. The 'top' 25% of growers averaged production of 15,00 trays per canopy hectare in 2016, over 20% above the record average yield for that year. This degree of variation in performance between orchards is typical.

There are other incentives influencing OGR for an individual orchard. Fruit size, fruit taste (dry matter content), time of harvest and how well fruit quality is maintained during storage all have a significant influence on grower income and vary considerably between growers. Interestingly, time payments for longer stored fruit are significant and many of the highest-earning growers have a significant income component for good-storing fruit whereas you might expect Kiwistart early harvest incentives to be more prominent.

The table below shows the key industry average production and income figures for Hayward kiwifruit in the past 7 years including the forecast of returns for the crop harvested in 2019 as at October 2019.

Year of harvest	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 Forecast**	**Average Actuals**
Income Year	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	
OGR $/ha	$ 42,659	$53,884	$ 56,673	$53,555	$59,981	$63,622	$67,295	$67,865	**$56,810**
Yield trays/hectare	8,160	8,972	11,048	12,281	8,937	11,668	10,089	10,190	**10,168**
OGR $/tray	$ 5.23	$ 3.51	$ 5.13	$ 4.36	$ 6.71	$ 5.45	$ 6.67	$ 6.66	**$ 5.47**
Kiwistart incentive/tray	$ 0.37	$0.40	$0.25	$0.35	$0.42	$ 0.39	$0.52	$0.26	**$ 0.37**
Taste incentive/tray	$ 1.52	$1.47	$ 1.20	$ 1.40	$ 2.37	$ 2.53	$ 3.55	$ - *	**$ 2.01**
Total area hectares in production	8,612	9,937	7,614	7,604	7,382	7,158	6,915	6,659	**7,735**
Fruit size fruit/tray	35.00	33.50	32.50	32.50	29.40	30.60	32.80	33.80	**32.51**

Trends shown in the table are:

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- Increasing average yield but significant yield fluctuations from season to season.
- Increasing average OGR/tray and OGR/hectare but still significant fluctuations
- Reducing area in production, due to conversion to Gold kiwifruit.
- Increased 'taste' incentive payment due to a changed payment policy (although due to the inability to continue maturity testing due to Covid-19 restrictions, there was no taste payment in 2020)

The area of Hayward kiwifruit has declined as growers have grafted over areas of green kiwifruit to more profitable gold varieties as licence for gold varieties has become available. More area will be converted from Hayward green kiwifruit as licences for Gold3 gold kiwifruit are offered for tender for several years to come. The final income for fruit harvested in 2019 is $6.67 per tray which is close to recent historic highs due to low volumes of fruit to market. Zespri have recently released their indicative range for fruit harvested in 2020 of between $5,40 and $6.90.

Zespri's Outlook document states the aim of Zespri of keeping the OGR/hectare for Green kiwifruit over $60,000, subject to seasonal factors. Through their 5-year planning horizon, they see the increased production of Gold kiwifruit will have the impact of reducing Green hectares and supporting Green returns, up to $7.00 per tray.

Gold3

Gold3, marketed as 'Sun Gold' is a Zespri-owned variety, and growers must be licenced for the area they have in the variety. Industry average production and income figures for Gold3 kiwifruit in the past 7 years are shown in the following table, including the final of returns for the crop harvested in 2019 as at June 2020.

Trends shown in the table below are:

- High average yield and increasing average yields as vines mature.
- High average OGR/tray and OGR/hectare despite increased area in production.
- Increasing area in production, due particularly to conversion from Psa-affected Hort16A gold kiwifruit since 2012 and also conversion from green kiwifruit.
- High 'taste' incentive payment due to payment policy reflecting consumer sensitivity to fruit taste. In 2020 due to the inability to continue maturity testing due to Covid-19 restrictions, there was no taste payment in 2020.

*Table 5: Gold3 Production and Returns Sourced from various Kiwifliers, 2020 Forecast from the August 2020 Kiwiflier Issue #416. *Note that due to the Covid-19 impacting the 2020 harvest, there was no additional taste payment.*

Year of harvest	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 Forecast**	**Average 7 years**
Income Year	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/2020	2020/21	
OGR $/ha	$79,156	$56,445	$69,703	$99,547	$114,553	$145,991	$161,660	$165,031	$111,511
Yield trays/hectare	6,147	5,919	8,321	11,466	11,377	13,403	13,631	14,276	10,567
OGR $/tray	$12.88	$9.54	$8.38	$8.68	$10.07	$10.89	$11.86	$11.56	$10.48

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Taste incentive/tray	$6.76	$5.82	$4.54	$4.44	$5.29	$5.76	$7.39	$ - *	$5.71
Total area hectares in production	383	1,813	3,339	4,116	4,629	4,996	5,483	6,046	3,850
Fruit size fruit/tray	30.5	28	30.6	29.9	26.7	27.3	29.5	29.7	29.0

NB figures are for Gold 3 and Gold3 organic, taken from Zespri's Kiwifliers. Yields are depressed by vines in their first 1-2 years of production, especially for figures up to the 2015 harvest, as the major area re-grafted after Psa disease occurred from winter 2012 and began producing from 2014.

Zespri's Outlook document of March 2019 predicts a range for OGR/hectare of over $100,000 on volumes growing to 108 million trays by the 2023 harvest up from the 66 million trays supplied in 2018. Longer term, returns are expected to moderate to an OGR around $8.00 per tray. Whereas current average over the past 7 years has been $10.23 per tray.

Yields for Gold3 are typically higher than those for Hayward. Average mature yields of over 15,000 trays per hectare are not uncommon for well set up and well-managed orchards.

Gold kiwifruit can be extremely profitable though requires a licence from Zespri to produce. Zespri intend to release 700 hectares of Gold3 licence for conventional (as opposed to organic) kiwifruit through until 2022. Between 2023 and 2026, Zespri is expected to release 350-700 ha of licence, subject to revision of market conditions and demand projections each year.

Results from the 2020 tender round for Gold3 licences were released in June 2020. The median price paid for licence, exclusive of GST, was $400,000 with the full offering of 700 ha of licence being sold. This was a significant jump up from the median price in 2019.

The table below shows increasing prices for licence and demand is significantly exceeding the hectares of licence being made available. Most significantly, the tender process can result in the prospective purchaser missing out on licence if the price they bid is below the required price. We believe that the impact of many growers missing out on licence this year mean the price growers are prepared to pay will remain high in the next tender rounds.

Table 6: Conventional Gold3 Licence Tenders for 2016 – 2020 (Source: various Zespri Kiwifliers)

Item	**2020 Results**	**2019 Results**	**2018 Results**	**2017 Results**	**2016 Results**
Median Price $/ha	$400,023	$ 290,000	$ 265,108	$ 235,000	$ 171,000
Minimum accepted price $/ha	$378,900	$ 148,206	$ 233,333	$ 221,000	$ 142,000
Total area available (allocated)	700 (700)	700 (700)	700 (700)	400 (400)	400 (400)
Total hectares bid for	1,660	1,681	1,079	1,277	1,359

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Other Zespri Varieties

Zespri is expected to release new varieties from their breeding programme every few years. The mechanism for release and pricing of licences varies, based on industry consultation. Each new variety goes through a learning curve in production systems and in the market. Improved male varieties as well as cropping (female) varieties are in the breeding programme.

Zespri Red (Red19) is a new variety of kiwifruit which was approved for commercial release by Zespri Board in December 2019. This 'sun-burst' variety has come through the Zespri breeding programme with Plant and Food Research and will be a licenced variety. It is thought that the red variety will be successful in markets due to its sweet taste and perceived health benefits due to the red anthocyanin pigments in the fruit. However, there are some concerns about the small size of the fruit and its long-term storability. An initial allocation of 150 ha of red licence will be released for the 2020 tender process, although this figure may change due to the availability of budwood. One thing that has been evident from the trial orchards for Red19 is that it had sensitive skin and requires a warm and well-sheltered orchard to be successful. More information about Red19 can be found in the New Variety Information Guide from Zespri. However, it is unlikely that Taranaki would have a suitable climate to grow Red19 due to the higher wind speeds and cooler temperatures than the top of the North Island.

Development Budgets

The development budgets can be developed for each individual assessment to analyse and plan the amount of potential beneficial value by Farm Ventures and Fruition Horticulture BOP for each property.

References:

This information, unless otherwise stated, has been sourced from reports produced together with Fruition Horticulture BOP on behalf of Farm Ventures.

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