

TARANAKI

like no other

The Potential for Horticultural Development in Taranaki





Foreword

As Taranaki's economy looks to diversify and grow to provide wealth for future generations, it is worth recalling one of the earliest marketing slogans devised for the region: 'Taranaki – Garden of New Zealand.'

This phrase captures the Taranaki region's fortuitous mix of temperate climate, rich volcanic soil and bountiful rainfall, which contribute to a landscape that has the potential to support a range of horticultural endeavours.

This report seeks to define the potential returns of smart interventions into the horticultural sector. It investigates the wide variety of crops that could offer commercially successful horticultural opportunities for the region's land holders, and how Taranaki's endemic culture of pioneering innovation can be applied to horticultural endeavours.

Successfully leveraging the opportunities that horticulture presents is about much more than soil, seeds and climate, or simply growing things. Success will be achieved as much by these factors as by people, hard work and innovation. Taranaki has proven that it has all of these components in spades.

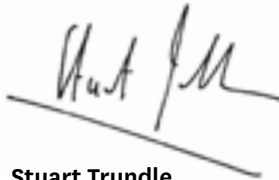
In creating this report, Venture Taranaki underscores its role as an independent and apolitical advisor to the

Taranaki region. In this document we look at the past, the present and the future to determine the role horticulture could play in this region's intergenerational prosperity.

I acknowledge the work done by Lincoln University's AERU team in providing the technical analysis behind this report, and welcome the pathways they have proposed to make best use of the opportunities our region has ahead of it.

Challenging ourselves to use Taranaki's natural competitive advantages to their utmost potential will help deliver a diversified and successful regional economy. That in turn will help lift New Zealand's performance.

This report should be read by all those with an interest in land-based industries to challenge thinking and inform future decision making.



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Detailed Independent Investigation

undertaken by the Agribusiness and Economics Research Unit (AERU),
operating from Lincoln University

Executive summary

The Taranaki horticultural sector is very small, and production areas have declined significantly over the last decade. A number of industries that were represented in the region in the past (kiwifruit, asparagus, berryfruit, feijoas, etc.) have not survived. In 2013 Venture Taranaki commissioned the AERU at Lincoln University to examine the opportunities for new horticultural industry development in Taranaki that could add value to the region's economic base; the opportunities for Taranaki provided by new horticultural market trends and trends affecting the sustainability of existing land-based enterprises (particularly dairy); and identify key issues for Taranaki in ensuring that the opportunities identified can be realised.

It is widely recognised that “anything will grow in Taranaki” and the region has large areas of land that have been classified as suitable for intensive horticulture, particularly on the ring plain that surrounds Mount Taranaki. The region has well drained soils, a temperate climate without extremes of temperature, and good rainfall. While there is little irrigation development in the region, horticultural development is unlikely to be constrained by lack of access to water from ground or surface water sources, although large-scale community irrigation developments in the region have been deemed unlikely. The region has large areas of land that have been classified as suitable for horticultural development, and horticultural development is not constrained by regional and district planning requirements in Taranaki.

Agricultural activity in Taranaki is dominated by the dairy industry, which is widely considered to be the “highest and best” landuse in the region. The dairy industry is a significant contributor to regional GDP and the region's

largest employer. The majority of those interviewed during the study consider that the future of dairying is assured; that the industry has the support of the wider community; and that the adverse environmental impacts of dairying in Taranaki are fewer than in many other regions.

The success of the dairy industry in Taranaki appears to have suppressed interest in other landuses to a large extent, and there has been an erosion of regional interest in horticulture since the failure of the local kiwifruit industry and Cyclone Bola in the late 1980s. However, as the high level of international concern about recent reports of possible contamination of whey protein produced by Fonterra demonstrates, heavy reliance on a single industry is not without risk.

The key factors that should be assessed by landowners considering diversification into new landuses are:

- Whether the area has a **comparative and/or competitive advantage** in these crops compared to other regions of New Zealand and/or overseas;
- Whether there is an **existing infrastructure** to handle development, production systems, and distribution;
- Whether there are **established markets** and marketing channels for outputs;
- The **structure and leadership** of the industry that is based on the enterprise outputs;
- Whether the new enterprise **complements the current farming system**.

The products of New Zealand's main horticultural industries, new crops proposed for Taranaki by previous studies, and industries that are currently being developed in the region were assessed with respect to these factors.

Main constraints to horticultural development in the region include:

- The regional economy is buoyant as a result of the high prices received for oil and gas and dairy production in world markets. There appears to be little regional drive for diversification.
- Much of the region's horticultural development has been undertaken by individuals who wish to live and work in Taranaki and have combined lifestyles and business, rather than because the region has been identified as having a comparative advantage in the production of particular crops. The exception to this has been ornamental plant and flower businesses.
- There is limited access to infrastructure, including limited transport options; packing processing and export facilities; consultancy services; locally based research institutions; educational opportunities.
- The price of land suited for horticulture in the region is high, and horticulture must compete for land that is also valued for dairy development or for rural lifestyle blocks. However, the prices for such land in other regions are also high. While the majority of those interviewed during the study consider that land prices are a constraint to horticultural development, it may be that land prices are not sufficiently low in Taranaki to encourage horticultural development despite the other constraints.

The main opportunities for diversification identified were the production of Manuka honey and industrial hemp.

- Manuka honey, which is unique to New Zealand, is in high demand in the global wound-care market because of its high levels of antibacterial activity. It has been identified as having major growth potential and demand in international markets exceeds supply. It provides an opportunity for diversification on land that otherwise has low productive value. Research funding has been secured, and Taranaki has an industry champion who is working actively to develop the industry in Taranaki.

- The New Zealand industrial hemp industry is in its infancy but world markets for a very wide range of hemp-based products are large and well-established. The industry development initiative is based in Taranaki, which is well-suited to hemp production, and the targeted level of production in the region is 1,200 hectares.

The most obvious role for Venture Taranaki in supporting the diversification of land-based production in the Taranaki region is in supporting emerging industries by:

- Liaising with emerging industry leaders to identify their present and future infrastructural requirements, and supporting infrastructural development where possible.
- Ensuring that emerging industries in the region understand and have access to all the publicly funded support for industry development that is available, and the assistance required to secure this.

Specific activities that Venture Taranaki might consider include:

- Prepare and publicise case studies of local businesses that have secured and used publicly available services to further the development of their businesses.
- Compile an up-to date and easily-accessible list of the funds and services available to land-based industry participants.
- Target key businesses to be approached directly to offer this support.
- Liaise with new industry representatives in order to understand their requirements with respect to infrastructure.
- Act as a facilitator for a group approach to the transport industry if demand is established.
- Assist in establishing grower forums or clusters in the emerging industries based on “novel crops” in the region.
- Liaise with Parininihi Waitotara to investigate the opportunities to provide assistance in furthering PKW's involvement with land uses other than dairying.



Introduction

1.1 BACKGROUND

The regional economy of Taranaki, which is growing more rapidly than any other regional economy in New Zealand, is underpinned by two key export sectors, the oil and gas sector and the dairy sector (MBIE, 2013). The increase in regional Gross Domestic Product (GDP) of almost 47 percent during the four years from 2007 to 2010 (Statistics New Zealand, 2013), was fuelled largely by expansion in the region's oil and gas industries. However, in employment terms, dairy product manufacturing and dairy cattle farming have been the largest contributors to regional job creation, accounting for 77 percent of the net increase in jobs in the region during the period from 2009 to 2010. The dairy sector is also the largest regional employer (Infometrics, 2012).

Although agriculture in total is an important contributor to GDP and employment in Taranaki, horticulture and arable cropping are not significant landuses in the region and receive little or no emphasis in regional and district

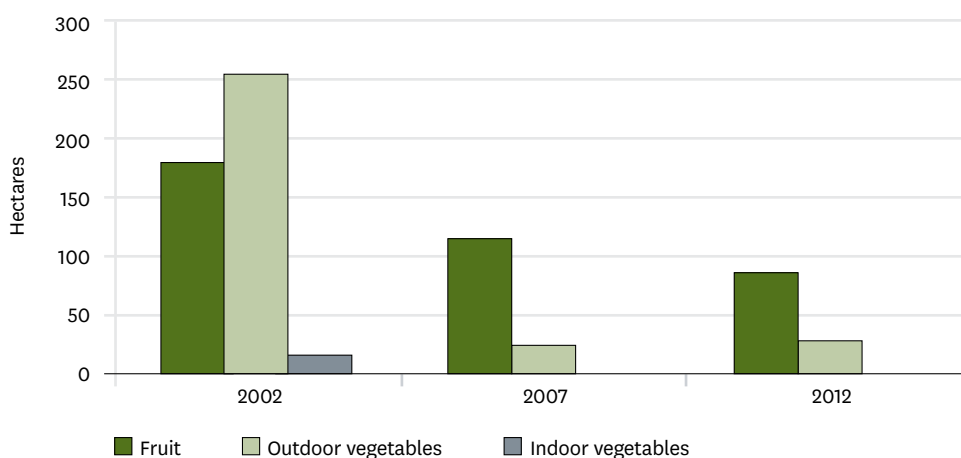
plans and economic development strategies (Taranaki Regional Council, 2009b).

Production is limited to very small areas of a diverse range of fruit and vegetable crops that are almost exclusively grown for the domestic market, some export flower and ornamental production, and small volumes of arable crops that are grown to support the dairy industry.

There have been a number of studies conducted in the past on the potential for, and constraints to, horticultural development in Taranaki (see Chapter 3) but the statistics record a reduction in the areas of horticultural crops grown during the last decade, as Figure 1 shows.

In 2002 the recorded area of outdoor vegetable crops comprised almost equal areas of potatoes and asparagus and very small (and not, therefore, reported) areas of a diverse range of other crops. In 2007 and 2012, the only vegetable crop of sufficient scale to be reported was potatoes. In 2002 there were 115 hectares of fruit production recorded, comprising approximately 50 hectares each of avocados and of kiwifruit, as well as small areas of other crops, particularly subtropical crops. By 2012 there was little kiwifruit production in Taranaki, and avocados, feijoas and tamarillos were the

FIGURE 1: AREAS OF HORTICULTURAL PRODUCTION IN TARANAKI 2002 TO 2012



SOURCES: PLANT AND FOOD RESEARCH 2003, 2012, STATISTICS NEW ZEALAND PERS. COMM.

only crops reported individually. The statistics on indoor crop production have not been reported consistently, but there are small areas of indoor vegetable and flower production in the region (Plant and Food Research, 2003, 2012; Statistics New Zealand pers. comm.).

A SWOT analysis reported in the regional economic development plan (Venture Taranaki, 2010) identified a number of changes required to facilitate regional economic development in the region, which could also facilitate horticultural development in Taranaki.

These included:

- Improvements in Taranaki's transport infrastructure including improved transport links within the region and to other regions by means of upgrading rail lines and improving access via State Highway 3 to the north and to the port, and improvements in coastal shipping;
- Finding ways of turning its relatively isolated geographical location into an advantage i.e. by focussing on its central location with respect to the eastern seaboard of Australia;
- Enhancing the regional skills base by developing initiatives that create education pathways for lifelong learning, and offering research and development assistance to businesses;
- Although regional investment must continue to foster the key industry sectors in the region, it must also "be encouraged into lifestyle and 'frontier' assets to ensure Taranaki is progressive, competitive and contemporary".

Venture Taranaki, the regional economic development agency is responsible for the regional economic development strategy, which recognises the rich natural resources of the Taranaki region and aspires to diversify the region's economic base. In that context, Venture Taranaki decided to determine whether there are niche opportunities in horticultural production that could be developed to diversify the primary production base. The AERU at Lincoln University was contracted to undertake this work in June 2013.

1.2 STUDY OBJECTIVES AND METHODOLOGY

The objectives of the study were:

- To contribute to the broader Taranaki regional development process by identifying the opportunities for new horticultural industry development in Taranaki that could add value to the region's economic base; contribute to the region's export activity; and/or create new frontier product/service possibilities for the region;
- To provide a report that enhances understanding of the opportunities for Taranaki provided by new horticultural market trends and trends affecting the sustainability of existing land-based enterprises (particularly dairy); and identifies key issues for Taranaki in ensuring that opportunities can be realised. The report will be suitable for use by a range of users, including the regional development agency, potential investors and others.

A range of sources of information were used in order to:

- Provide a brief commentary on the landuse capability, soils and climate of Taranaki; and the expected impacts of climate change and their implications for horticultural development in the region;
- Consider key factors in the selection of new crops/ horticulture industries for Taranaki as well as those that influence the sustainability and profitability of the dairy industry in Taranaki, and the extent to which these are likely to influence the development of new crops/industries in the region;
- Examine market trends in horticulture (including aspects such as functional foods); investigate new directions and opportunities for the Taranaki region; and the potential for partnership initiatives with other stakeholders that will improve the access of investors in Taranaki horticulture to new opportunities;
- Assess the present state of Taranaki's horticultural support infrastructure;
- Identify key areas in which regional initiatives will be required to facilitate the development of new crop enterprises in Taranaki.



The sources included a series of 50 personal and telephone interviews with horticultural producers; infrastructural providers; industry organisations and other stakeholders. Published data and reports on horticulture and dairying in the region and on regional resources, and internet sources of information on market trends were used extensively.

Participants, or recent participants, in a number of horticultural industries in Taranaki were interviewed during the study. Interviewees were identified from a database held by Venture Taranaki, by industry organisations including Horticulture New Zealand (Lee Catley, Communications Manager, Horticulture New Zealand pers. comm.), New Zealand Trade and Enterprise (Nick Fleming, New Zealand Trade and Enterprise Taranaki, pers.com) and by other growers. Others included representatives of industry organisations, businesses providing services to horticulture, Iwi, and local bodies.

1.3 SCOPE OF THE REPORT

The existing landuses in Taranaki and the physical resources of the region are described in Chapter 2. Chapter 3 summarises previous studies of the potential for horticultural development in the region and identifies and discusses the factors influencing the success of any new horticultural development. Factors affecting the sustainability of the Taranaki dairy industry are also discussed in Chapter 3. In Chapter 4 the horticultural base of Taranaki, new developments in horticulture in the region and constraints to horticultural development identified during the study are described, and the conclusions from the study are discussed in Chapter 5.

Landuse Capability and Current Landuse in Taranaki

2.1 EXISTING LANDUSE IN TARANAKI

Agricultural production in Taranaki has been dominated by dairying since the beginning of the 20th century, particularly on the fertile ring plain that surrounds Mount Taranaki, and which is one of the world's most intensive dairy areas (TRC, 2011). This area also comprises a large part of the area identified in the Landuse Capability Classification as suitable for horticulture or cash cropping (Blaschke, 1992). In 2011/12 there were an estimated 1,971 dairy herds in Taranaki (LIC and DairyNZ, 2012).

Sheep and beef farming in Taranaki is concentrated in the hill country, and there is an increasing trend for these farms to provide support to the dairy industries as sheep and beef cattle numbers decline. In 2012/13 the number of sheep and beef farms in Taranaki was estimated to be 1413 (Enrique Gonzalez-Macuer, Beef and Lamb New Zealand, pers. comm.).

Horticulture and arable cropping are not significant landuses in Taranaki, and have received little attention in regional plans and strategies to date.

The official statistics capture little information on changes in horticultural production in Taranaki, because the levels of production of most horticultural crops grown in Taranaki are so low that data are not published for reasons of commercial sensitivity.

The results of the recently released 2012 Census of Agricultural Production (Statistics New Zealand, 2013) are shown in Table 1. Taranaki has experienced a significant decline in livestock numbers during the last decade. Percentage reductions in the numbers of sheep, beef cattle and deer have exceeded those experienced nationally, and in contrast to most other regions, dairy cattle numbers are also lower in 2012 than in 2002. Dairy numbers fell by 10 percent between 2002 and 2007, and although numbers increased in the following five years they have not returned to 2002 levels. This reflects the changes in the structure of dairying during the last decade, particularly in the first five years when the number of herds declined by 18 percent (although the number of cows declined by only four percent), as amalgamation of many of the regions' small dairy farms occurred. Approximately 10,000 hectares were removed from dairy production between 2002 and 2007, but areas have been stable since that time.

Despite the region's fertile soils and a three-tier seasonal climate advantage (crops could be grown to mature sequentially from the north of the region) which can give an extended season for any processing operation (South Taranaki District Council, 2007), declining areas of horticultural production in Taranaki have been recorded over the last decade. Taranaki makes only a very minor contribution to production of New Zealand's four major fruit crops; wine; kiwifruit; pipfruit and avocados. The statistics show that in 2012 there were no kiwifruit grown in Taranaki (although small areas had been recorded during the previous decade), and very small areas of wine grapes and pipfruit. Sixty two hectares (one percent of the national area) of avocados are grown, nine hectares of feijoas and eight hectares of tamarillos. The only vegetable crop for which production is recorded is potatoes (23 hectares).

TABLE 1: CHANGES IN TARANAKI LIVESTOCK NUMBERS 2002-2012

Livestock (000)	2002	2007	2012	Taranaki % change	National % change
Sheep (000)	698	656	434	-61%	-27%
Dairy cattle (000)	652	590	604	-8%	20%
Beef cattle (000)	127	137	104	-22%	-20%
Total deer (000)	11	4	4	-175%	-55%



Although the 2007 census recorded that there were 27+ hectares of flowers and bulbs grown in Taranaki and three hectares of nursery crops, data on these crops were not included in the most recent census (Danny Ren, Statistics New Zealand, pers. comm.).

Very small areas of a diverse range of other crops were recorded in the most recent census of agricultural production in Taranaki, but these were too small to be reported. These crops are listed in Appendix 1.

2.2 THE PHYSICAL ENVIRONMENT

2.2.1 PHYSICALLY SUSTAINABLE LANDUSES IN THE TARANAKI REGION

In 1992 the Department of Scientific and Industrial Research – Land Resources (now Landcare Research) classified the Taranaki region according to its physically sustainable landuses (Blaschke et al., 1992). Seven sustainable landuse classes were defined, which differed according to the intensity of the highest sustainable landuse possible. The most intensive of the classes was “intensive horticulture”, which was defined as the “intensive production of high value cash crops, usually fruit or vegetable crops. Involves repeated and regular cultivation, as well as fertiliser and herbicide application, and sometimes irrigation. Includes orcharding with intensive ground cultivation”.

The classification was based on information from the New Zealand Land Resource Inventory (NZLRI) (National Water and Soil Conservation Organisation, 1975-79) and the

Landuse Capability Classification (LUC), which have been widely used to identify opportunities for, and constraints to, the use of specific areas of land (Lynn et al, 2009).

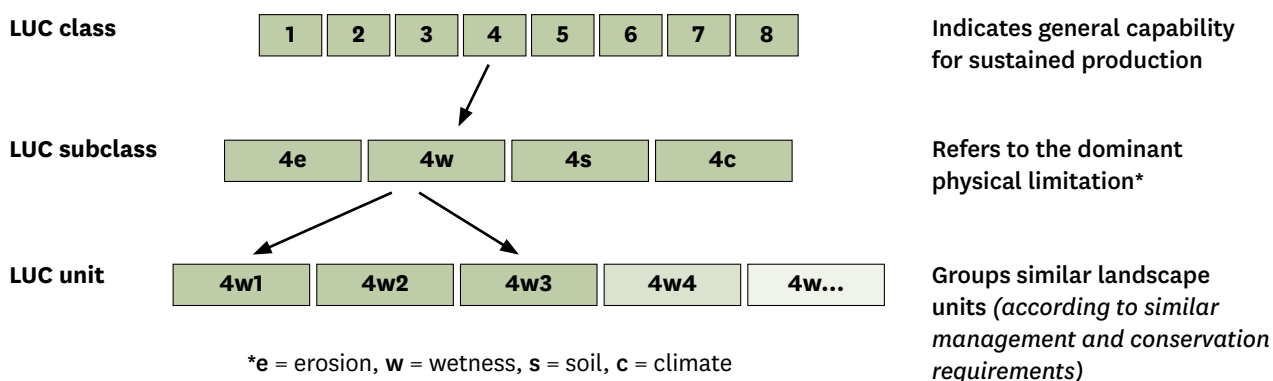
The LUC classifies all land in New Zealand on the basis of its ability to sustain agricultural and forestry production. It takes account of the physical limitations of the land, and of its soil conservation needs and management requirements. Land is classified at three levels which are shown in Figure 2.

The “Class” indicates the suitability of the land for different types of productive use. Classes are numbered from 1 to 8, with higher numbers indicating greater limitations and less versatility. Classes 1 to 4 are suitable for arable cropping, horticultural production, pastoral use, and tree crop or production forestry use. Classes 5 to 7 are not suitable to arable production, may be suitable for vineyard and berryfruit production and are suitable for pastoral and forestry use. Class 8 land is unsuited to agricultural or forestry production.

The “Subclass” identifies the main type of limitation where “e” denotes susceptibility to erosion as the main limitation, “w” denotes high water table, poor drainage or flooding; “s” indicates that soil characteristics are the dominant limitation; and “c”, that climatic extremes are the most limiting factor.

The “Unit” groups land areas that respond similarly to management, and are adapted to the same kinds of crops and uses (Lynn et al, 2009).

FIGURE 2: COMPONENTS OF THE LANDUSE CAPABILITY CLASSIFICATION



SOURCE: LYNN ET AL. (2009)

The LUC must be applied consistently over the whole country, which limits its flexibility compared with a classification developed specifically for a region. The classification developed by Blaschke et al. (1992) was developed specifically to reflect the “actual and potential” landuses in Taranaki. Variability within mapping units has been incorporated by allocating more than one sustainable landuse to a mapping unit. Thus, while the largest proportion of a mapping unit area may be suitable for intensive horticulture (its Principal Sustainable Landuse (PSLU)), Minor SLUs (MSLUs) within the unit may be suitable only for less intensive landuses. Conversely, there may be areas suited to intensive horticulture within mapping units where the Principal SLU is less intensive. MSLUs must comprise at least 10 percent of the mapping unit in order to be recognised. Consequently, although almost all land for larger-scale landuses such as dairy production is likely to be identified, opportunities for niche horticultural development, which occurs on small areas, often with specific microclimatic conditions, are likely to be underestimated. In addition, in areas where horticulture has been identified as the PSLU, less intensive uses, particularly dairying, are also feasible, and most of this land is presently used for dairy production.

In total, 88,700 hectares, or 12.3 percent of the regional area (83,590 hectares and 17.3 percent of the area excluding indigenous vegetation), has been classified as having intensive horticultural production as a PSLU or an MSLU. On 36,000 hectares intensive horticulture is the only SLU identified. On the remainder, 39,000 hectares have intensive horticulture as the PSLU with one or more MSLUs; while on 12,000 hectares for which cash cropping has been identified as the PSLU, some areas are suitable for intensive horticulture. Almost 90 percent of the land on which intensive horticulture has been identified as an SLU comprises land with tephric (produced by a volcanic eruption) soils on, or adjacent to, the ring plain and the marine terraces of North and South Taranaki. In addition intensive horticulture has been identified as a minor sustainable landuse on some areas formed from volcanic mudflows (lahars), on the ring plain, generally to the west of Mount Taranaki. The LUC classification and limitations on the areas identified as suitable for sustainable horticultural production uses are summarised in Table 1, while Figure 4 shows the Principal SLUs identified in the Taranaki region as defined by Blaschke et al. (1992).

TABLE 2: AREAS SUITABLE FOR INTENSIVE HORTICULTURE – LUC UNITS AND LIMITATIONS

LUC Unit	Area (ha)	Principal SLU	Minor SLU	Limitations/ potential for horticulture
1c1	8,760	IH		Shelter and irrigation required. A range of subtropical fruits can be grown
1c3	26,640	IH		Close shelter and irrigation required. A range of subtropical fruits can be grown
1w1	990	IH		Shelter and drainage required
2c2	12,030	IH	1. D 2. CC	Close shelter and some irrigation required for horticulture. Coastal strip not suited to horticulture
2c3	26710	IH	1. CC	Shelter required. Versatility may be limited in higher rainfall areas.
2e1	9,480	IH		Shelter required. Erosion control required when bare ground exposed.
2s3	3,960	CC	1. IH	Horticultural use limited by soil depth in places. Benefits from irrigation and shelter.
3s1	8,080	CC	1. IH	Potential for flooding (1:15 years) limits horticulture. Shelter and irrigation required in places.

NOTE: IH = INTENSIVE HORTICULTURE; D=DAIRYING; CC= CASH CROPPING



While it is not clear exactly what proportion of this area can sustain intensive horticultural production, provided irrigation and shelter are available, horticultural development is not limited by the land capability of the region.

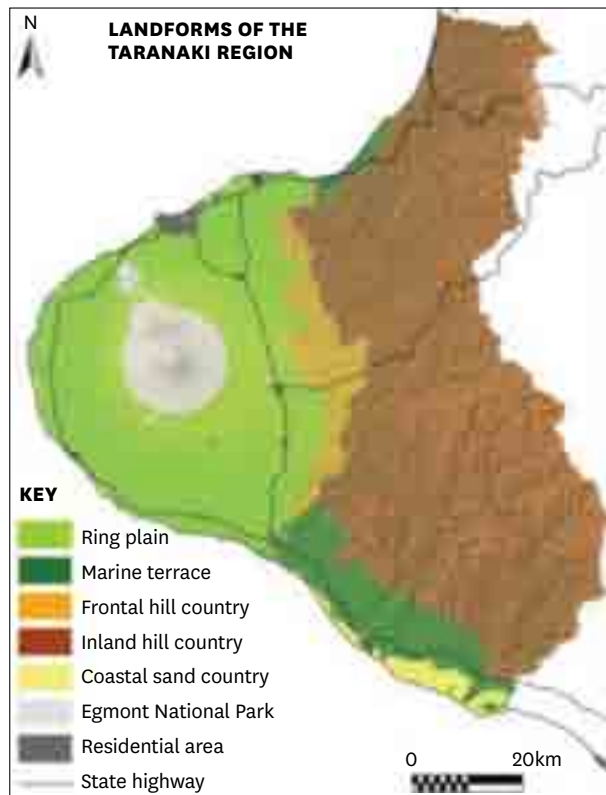
2.2.2 SOILS

The soils of Taranaki relate to the four broad land forms of the region, which are shown in Figure 3.

The soils of the ring plain are mostly deep, free-draining, fertile, volcanic ash yellow-brown-loams (YBEs).

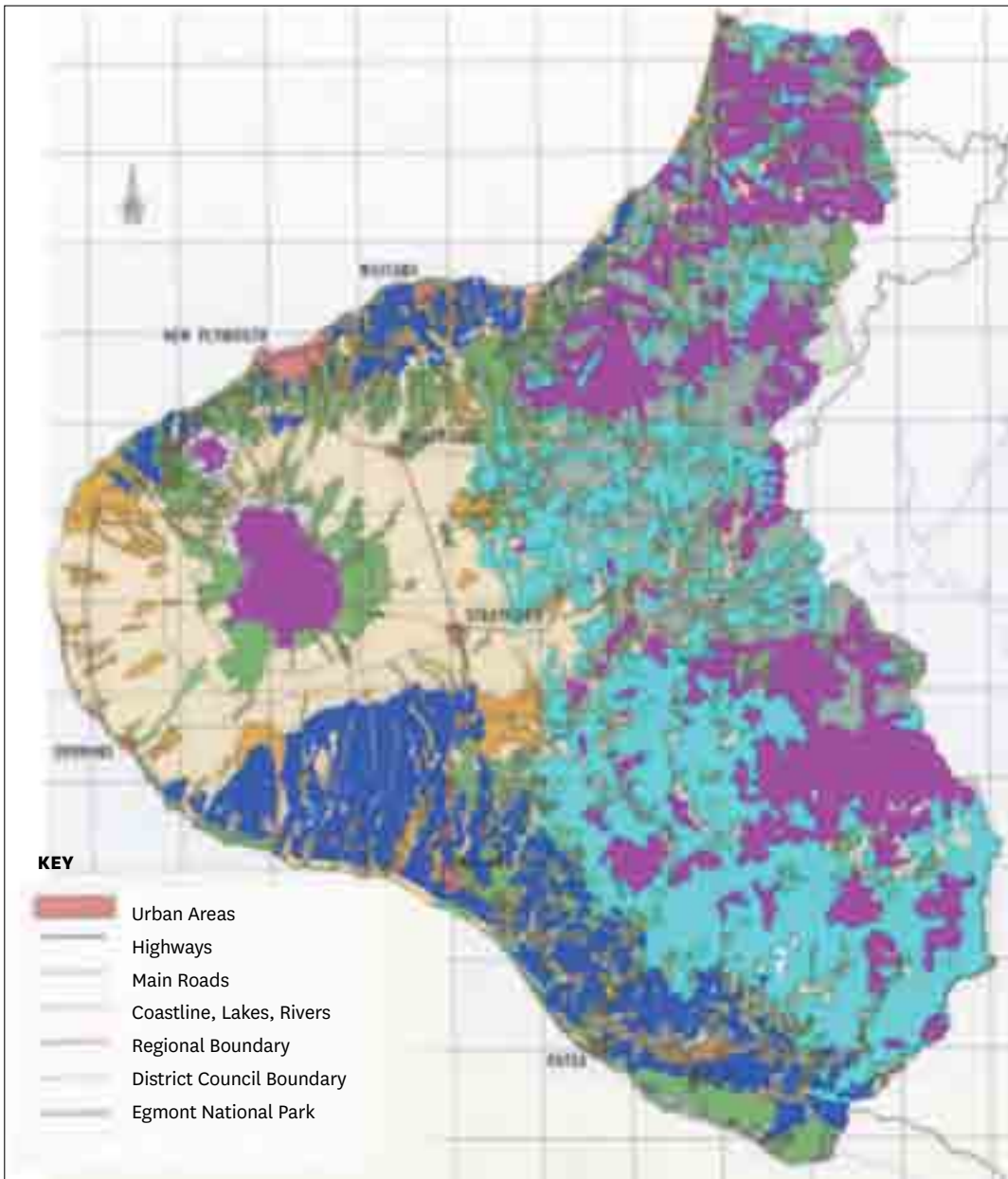
To the east of the ring plain lies the frontal hill country and inland terraces. Most of this area comprises volcanic soils but it includes areas of swampy soils in the Tariki-Inglewood area. Many of these have an iron pan that impedes drainage, but can be high producing. Peaty soils located in the Stratford area require drainage but are fertile soils capable of high production .

FIGURE 3: LAND FORMS OF TARANAKI



SOURCE: TRC, 2009A

FIGURE 4: PRINCIPAL SUSTAINABLE LANDUSES IN TARANAKI



SUSTAINABLE LAND USES							% area
Intensive hort.	Cash cropping	Dairy	Drystock grazing	Pasture & trees	Forestry	Protection	11.6
	Cash cropping	Dairy	Drystock grazing	Pasture & trees	Forestry	Protection	3.3
		Dairy	Drystock grazing	Pasture & trees	Forestry	Protection	21.5
			Drystock grazing	Pasture & trees	Forestry	Protection	9.2
				Pasture & trees	Forestry	Protection	11.7
					Forestry	Protection	25.8
						Protection	16.4

SOURCE: BLASCHE ET AL., 1992 (SUPPLIED BY TRC)



The soils of the inland hill country are based largely on papa or older sedimentary rocks including mudstone, sandstone and siltstone. They are generally shallow and erodible because of the steepness of the topography. The marine terraces in the southern part of the region are deep, fine-textured, volcanic loams with high natural fertility, while in the small area of coastal sand country, soils have weak structure and are prone to wind erosion (TRC, 2009a).

Although Taranaki is one of the most intensively farmed regions in New Zealand, the Taranaki Regional Council reports that there are currently few major problems relating to soil health in the region. However, problems such as soil compaction, nutrient depletion, residual soil contamination, and the excessive use of fertilisers may emerge in the future if sustainable land management practices are not adopted (TRC, 2009b).

2.2.3 CLIMATE

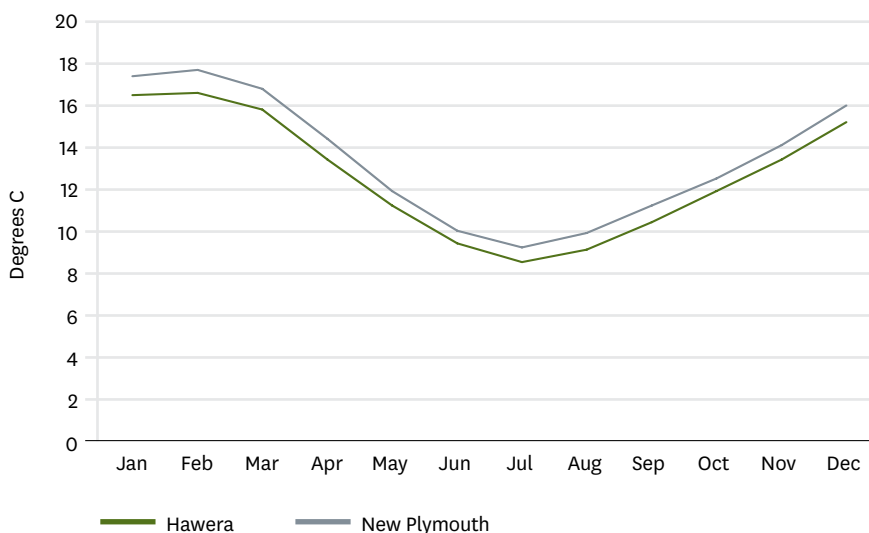
The Taranaki region has a temperate climate, without extreme variability between seasons. Because the region

is exposed to the weather patterns over the Tasman Sea the climate is generally windy and shelter is required for horticultural development in most areas. Summers are warm and sunny, while winters are relatively mild.

Annual mean temperatures vary between 11° Celsius (C) inland and 14° C in coastal areas. During summer, maximum air temperatures generally lie between 19° C to 24° C and temperatures higher than 30° C are seldom experienced. During the period 1971 to 2000 the highest temperature recorded in New Plymouth was 30.3° C (MacIntosh, 2001). Winters are relatively mild with daytime maximum air temperatures ranging from 10° C to 14° C. Frosts occur inland during clear calm conditions in winter, but snow is very rarely experienced (Baldi and Salinger, 2008). Typical winter daytime maximum air temperatures range from 7° C to 14° C (Ministry for the Environment, 2008).

The average monthly temperatures at New Plymouth and in Hawera, to the south of the region, are shown in Figure 5.

FIGURE 5: AVERAGE MONTHLY TEMPERATURES NEW PLYMOUTH AND HAWERA

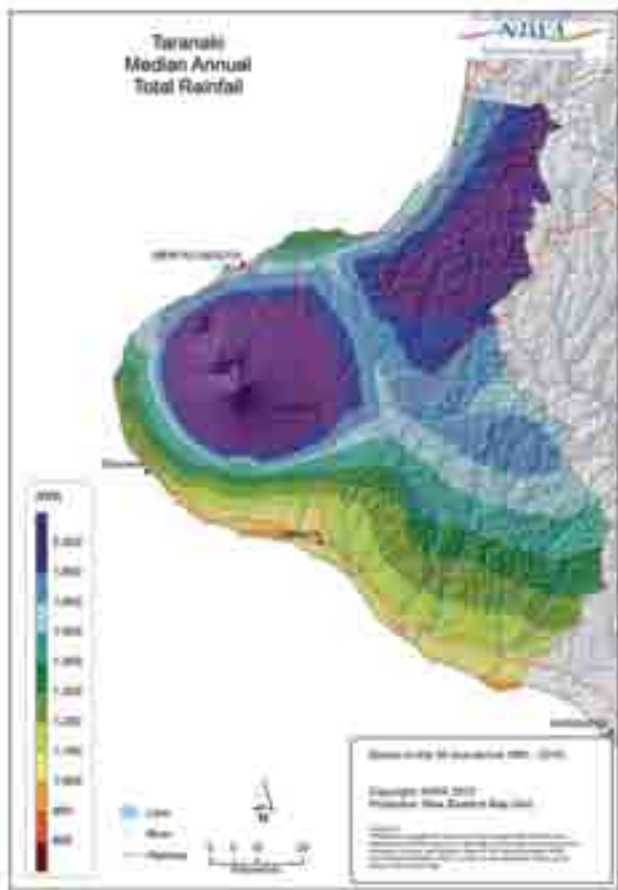


SOURCE: METEOROLOGISK INSTITUTT NORWAY

Regional rainfall levels and patterns are strongly influenced by Mount Taranaki as Figure 6 shows. Coastal areas in the south of the region are comparatively dry while northern and central regions generally experience high rainfall. Drought does occur in the region during periods when anticyclones occur east of the South Island, primarily along the southern coast, although northern areas do experience some periods of potential evapotranspiration deficit and New Plymouth is at the centre of the driest area.

Average monthly rainfall data for the period 1980 to 2010 (National Institute of Water and Atmosphere, NIWA,

FIGURE 6: AVERAGE ANNUAL RAINFALL IN TARANAKI

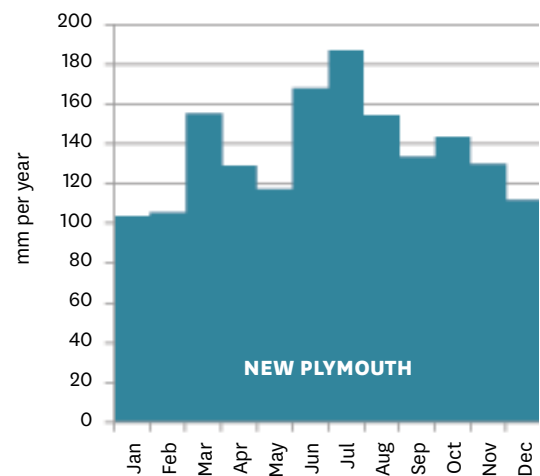
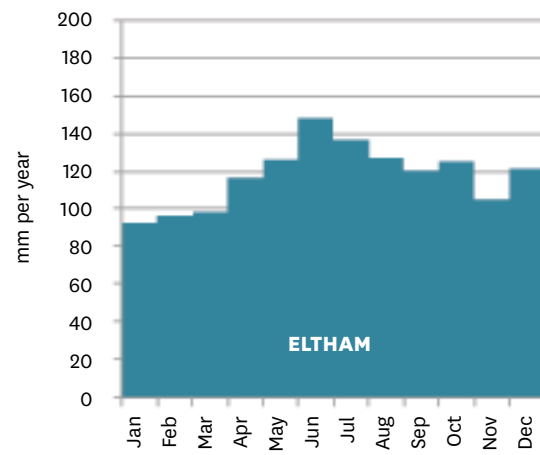


SOURCE: NIWA CLIMATE EXPLORER

2013) from Eltham (South Taranaki and inland) and New Plymouth (to the north and coastal) are shown in Figure 7. These data show that rainfall variability throughout the year is lower in inland Eltham, while in New Plymouth, winter rainfall is markedly higher than during summer.

The region has comparatively high sunshine hours annually, and New Plymouth is ranked fifth on a list of thirty representative regional locations (MacIntosh, 2001) on the basis of average sunshine hours during the period 1971 to 2000 with 2,182 hours. In the North Island this was exceeded only by Tauranga (2,280 hours) and Napier (2,188 hours).

FIGURE 7: AVERAGE MONTHLY RAINFALL, ELTHAM AND NEW PLYMOUTH 1980 TO 2010



SOURCE: NIWA CLIFLO



High winds occur over Taranaki when vigorous fronts, troughs, deep depressions or cyclones cause strong northerly to westerly airflows or south-easterly airflows over the region. In the former cases the region is exposed to these airflows coming in from the Tasman Sea. In the latter case down-slope leeward winds from the central North Island can be very strong, causing substantial damage. At New Plymouth over a third of the years have their annual maximum gusts from the west, and gusts of just below 110km/hr are experienced every five years on average. However, the highest gusts at New Plymouth, which have been recorded at more than 145 km/hr, are south-easterly winds. Winds of this magnitude are expected in less than one year in 50.

The Taranaki region experiences a high incidence of adverse climatic events, which have the potential to inflict significant damage on horticultural enterprises in the region. On average the region will experience one tornado annually and a severe tornado every four years. These often move inland from the coast, inflicting damage over an average path of 100 metres in width and five kilometres in length (Range: 1.5 to 500 metres width; 1.5 to 16 kilometres in length). Ex-tropical cyclones pass within one degree of latitude of New Plymouth in three out of five years on average (Baldi and Salinger, 2008). During Cyclone Bola in 1988 glasshouses were blown out, and cash crops valued at millions of dollars were decimated. Losses were estimated to be between 30 and 50 percent of export crops in Taranaki (valued at up to \$1 million). Some kiwifruit crops were completely lost and most of the crop was bruised and unsuitable for export. There was also considerable damage to vines and shelter plantings. Tamarillo crops also suffered severely during the storm (NIWA, 2008).

2.2.4 CLIMATE CHANGE

The impacts of climate change on the Taranaki region have been modelled under a number of risk scenarios (Baldi and Salinger, 2008). The scenarios were based on a range of global climate models based on scenarios developed by the Intergovernmental Panel on Climate Change (IPCC, 2007). Mid-point estimates from this research suggest a number of potential climate change impacts that may affect horticultural production in Taranaki, including:

- Average temperatures are forecast to increase by up to 3° C during the current century;
- Rainfall is likely to decrease in summer and increase in winter resulting in an increase in total rainfall of up to 20 percent. The number of extreme rainfall events in the region is expected to double by the end of this century under a mid-range temperature change scenario, and flooding to become more frequent and severe;
- Westerly gales and storm force winds from the west are likely to increase in Taranaki during this century. In flat areas the annual frequency of winds of more than 30 metres per second (classified as fresh gale on the Beaufort scale) are likely to increase by 40 percent by 2030 and 100 percent by 2080.
- There is evidence that there will be an increase in the frequency of tropical cyclones, but the extent to which this will lead to an increase in ex-tropical cyclones that affect New Zealand is not known. However, the authors conclude that it is likely that there will be an increase in the risk of higher intensity ex-tropical cyclones that cause large storm impacts during the 21st century;
- While there is expected to be an increased risk of drought, particularly in southern coastal areas of Taranaki, low to medium temperature increase scenarios do not suggest a major change in drought frequency, while medium to high temperature change scenarios suggest that the frequency of severe droughts may at least double in central and southern areas of the region.

The Taranaki Regional Policy statement concludes that hotter summers may lead to increased competition for water uses in some areas and facilitate the spread of some pests and diseases. However, the impacts of climate change may open the way for new crops and associated industries to develop in Taranaki (TRC, 2009b).

2.2.5 IRRIGATION

Much of the area for which intensive horticulture has been identified as the Principal SLU requires irrigation development, which has not traditionally been undertaken, in the region because of its comparatively high rainfall. However, between 2007 and 2012 the area of irrigation almost doubled from 3,700 hectares to 6,500 hectares and most of this increase has involved the development of spray irrigation systems (Statistics New Zealand, 2013).

Recent droughts, and increased Government support for the development of irrigation infrastructure (MFE, 2013) have prompted a review of the potential for irrigation in the region (Rajanayaka, et al., 2012). Although the review found that development of large-scale community irrigation schemes is unlikely in the region, it did not find that irrigation itself is not viable in this area.

Although there is little irrigation in the region at present, Taranaki has plentiful water supplies. Irrigation development is more likely on individual properties or clusters of properties on lighter soils and in areas of low rainfall. Suitable properties are those with easy access to rivers or streams, suited to storage if this is required and whose owners “have a positive mindset towards irrigation”. Large-scale irrigation from surface water sources is likely to be constrained by TRC rules limiting the use, damming or diversion of water from surface sources in order to manage the conflicting demands of abstractive and in-stream users in times of low flow (TRC, 2012a).

The groundwater resource in Taranaki is not considered to be under stress, since total use for all consumptive purposes is only 0.5 percent of total recharge (TRC, 2012a) and the irrigation review (Rajanayaka, et al., 2012) concluded that although large-scale development of irrigation from groundwater sources is unlikely, it is feasible for the provision of water to small properties.

Horticultural development in Taranaki is unlikely to be constrained by lack of access to irrigation water.



Factors Influencing the Potential for Horticultural Development

3.1 PREVIOUS STUDIES OF THE POTENTIAL FOR HORTICULTURAL PRODUCTION IN TARANAKI

Since the mid-1980s there have been several studies that have investigated the potential for horticultural development in Taranaki.

The first three of these were summarised in the fourth, an investigation into improving the competitiveness of horticulture in Taranaki by John Haylock (1998).

Previous studies include:

1. Wilms, T.R. (1985). Planning for land diversification. A manual prepared for Taranaki farmers and part-time farmers. New Plymouth, Taranaki United Council. Land Resources Advisory Committee. 160pp.
Wilms prepared a grower manual on the production and management of a range of horticultural crops for export and the domestic market, amongst other agricultural and forestry options.
2. Taranaki United Council; New Zealand, Town and Country Planning Directorate. New Plymouth Residency. (1987). *Taranaki Rural Landuse Priorities Study*. A report to the Taranaki United Council. 54pp
In this study the Land Resource Inventory maps of Taranaki were used to determine the suitability of Taranaki for the production of nine crops (seven horticultural crops) and gross margin analysis was used to compare the profitability of crop production with a range of pastoral uses. The study concluded that almost the entire ring plain was better suited to horticultural than pastoral uses.
3. A suite of reports (cited by Haylock 1998 but no longer available) were prepared for the Taranaki Land Based Development Trust on aspects of land diversification in the region. On the basis of these it was concluded that development would be facilitated by:
 - Provision of free, regionally-specific information;
 - Promotion of success and excellence through a Taranaki Agribusiness Leadership Award;
 - Promotion of Taranaki produce to exporters, supermarket chains and investors;

- Use of extension tools to promote opportunities to local landowners;
- Facilitation of cooperation between potential stakeholders;
- Identification of training needs and promotion of education and training to landowners;
- Promotion of land-based careers to local secondary pupils.

4. The Haylock study (1998) involved a survey of horticultural business owners in Taranaki to elicit their perceptions of constraints to, and opportunities to facilitate, horticultural development in Taranaki. The most frequently cited constraints to expansion at this time were:

- Lack of growing information;
- Lack of suitable finance;
- Lack of reliable marketing information;
- Lack of trained staff.

Less frequently mentioned constraints included lack of encouragement by local government, the costs of rates, climatic conditions, consistency in product returns, energy costs, and lack of confidence in New Zealand's economy.

Factors considered important in facilitating horticultural development/expansion included:

- Improved co-operation between growers;
- Better utilisation of transport;
- Up-to-date training opportunities;
- Establishment of discussion groups;
- Improved liaison with research institutes;
- Availability of information on new products and markets;
- Market access information;
- Availability of consultancy services;
- Establishment of a producer cooperative.

5. The final study (Burge et al., 2000) evaluated a diverse range of new crops for Taranaki in terms of their agronomic and post-harvest requirements; market prospects; Taranaki's competitive advantage in production; and future possibilities. These included

14 floriculture crops; 10 medicinal crops; three new vegetable crops; two industrial crops, two herb teas; one nut crop, truffles, nine plant extracts and five fruit crops. A brief re-evaluation of those crops has been conducted as part of the current study (See Chapter 4).

3.2 FACTORS INFLUENCING THE SELECTION OF HORTICULTURAL ENTERPRISES FOR TARANAKI

There are number of factors that determine whether a new industry is likely to succeed, which are also key to determining whether a particular enterprise is appropriate for introduction to, or expansion in, a growing region with particular characteristics. These were identified by Greer et al. (2000) in a review of the impediments to growth of emerging industries. This section is based on work undertaken in the AERU by Greer et al. (2000), Greer et al. (2002) and Saunders et al. (2011, unpublished).

The factors most likely to be critical in determining the success of horticultural developments that were identified in earlier studies include:

- The extent to which Taranaki has a competitive or comparative advantage in the production of the proposed crops compared to other regions of New Zealand and/or overseas competitors. In simple terms, comparative advantage is derived from access to particular resources not available to producers elsewhere, or at lower cost than elsewhere. Competitive advantage arises if participants in the local industry have exclusive access to knowledge or technologies that lead to cost advantages or product differentiation. Competitive advantage can be driven by innovation at any or all levels of the value chain. One region or country may not have an absolute advantage in the production of any crops, but both will be better off if each specialises in the production of the one in which they have the greatest competitive/comparative advantage. A number of reports (see Chapter 4.1) and several of the industry participants interviewed for this study have observed that a wide range of horticultural products is able to be grown in Taranaki, and Burge et al.(2000) identified several in which Taranaki may have a degree of comparative advantage;
- Whether there is ready access to the infrastructure needed for development, production and harvesting, transport and distribution of the end product;

- The existence of established markets and marketing channels for the products;
- The structure and leadership of the industry that is based on the enterprise outputs;
- Whether the enterprise complements existing landuses in the areas of Taranaki identified as suitable for horticultural production, or whether it can compete with those enterprises for land and capital.

Other factors of particular importance to successful enterprise development in Taranaki include the influences on the sustainability of dairying in Taranaki and trends in international horticultural markets.

New enterprises can be categorised in terms of the current production and market status of their outputs. Saunders et al (2011) described five categories of products that may lead to the development of new horticultural enterprises on the West Coast of the South Island, that apply equally to developments in Taranaki. The categories were defined in terms of the nature of their markets and production technologies.

- **Products that meet specific market demands and niche opportunities:** These may provide the best opportunity for expansion of horticulture in Taranaki. Some of New Zealand’s well-established horticultural industries have been niche developments at the outset, including the export cherry industry and the avocado industry. The development of the export cherry industry was market-led by producers who recognised New Zealand’s ability to provide out-of-season supplies of high-quality fruit to Northern Hemisphere markets. New Zealand’s fourth largest horticultural export industry, the avocado industry is still often described as a niche industry since New Zealand Hass avocados are exported to Australia and the United States during a window before domestic supplies are harvested.

Niche developments are generally based on clearly identified demand, consumer requirements, and contractual arrangements, and are likely to occur in suitable locations using appropriate technologies (imported or developed) from the outset.



The technologies developed often remain the intellectual property of private companies, which contract with growers and may carry out part or all of the crop management activities. This is the case with the specialist small seed industry in New Zealand. In these circumstances access to technologies, genetic material and market knowledge can be tightly controlled, which may create barriers to entry for outside participants, and limit industry expansion.

- **Products that are currently grown in Taranaki for which there are well established domestic and or international markets:** A diverse range of horticultural products is, or has been, grown in Taranaki in the past with varying degrees of success, as Chapter 4 describes. The region has had little success in gaining a foothold in New Zealand's major horticultural export markets to date, although a number of food products (e.g. lettuce, tomatoes, herbs) are being grown successfully for the domestic market, and there may be potential for expansion of the range of products of this nature. The most successful export crops in the region at present are flower crops (e.g. orchids) and ornamental plants.
- **Products for established markets grown in New Zealand but not grown in scale in Taranaki:** There may be opportunities for diversification of the region's horticultural production base into the established horticultural industries in New Zealand.

The most important requirements in this situation are that there is unmet demand for New Zealand consumption or export of these products or that Taranaki growers can produce a higher quality product than existing suppliers, have different seasonal production patterns, or would incur lower costs of production and distribution than other suppliers.

In fact few products are grown in scale in the region so any horticultural expansion for established markets will fall into this category. Most of the major horticultural industries have ambitious plans for

expansion in order to contribute to the Government's Business Growth Agenda (NZ Government, 2012) (see Chapter 4). This is, perhaps the easiest avenue for potential growers since these industries are based on supplying large international markets and there is often little competition between New Zealand producers and strong incentives to co-operate to resolve technical problems, if these have not been addressed already. The major difficulties faced by industries in this situation, for example the pipfruit industry, are the instability of markets and the continued reliance on maintaining low costs of production or obtaining quality premia in highly competitive markets. At the other end of the spectrum there are small industries, such as the orchid industry, which also supply large well-established international markets. However, there is little cooperation in the New Zealand industry in solving production issues and newly developed intellectual property is not readily shared among industry participants.

- **Products for well-established international markets that are not currently grown in New Zealand:** In New Zealand horticultural industries of all sizes, including the wine industry, which is the largest horticultural export industry, the citrus industry, and the olive industry have developed in response to the identification of such opportunities. Burge et al. (2000) identified a number of crops of this type in which it may be possible for Taranaki growers to exploit a potential comparative advantage. The success of these industries depends on the ability of local producers to produce a higher quality product than existing suppliers, or a comparable product at lower cost. The successful establishment of these industries usually depends on industry champions or pioneers, who develop production technologies suited to the New Zealand environment, and establish initial distribution channels into international markets. In contrast to industries based in niche markets, there is often little competition between local producers supplying large international markets, because there is a strong incentive to cooperate to resolve technical problems and develop marketing initiatives. This has not, however, always been the case in

New Zealand where the flower industry in particular has failed to establish a cooperative base for industry development. The major difficulty faced by growers of these products is the need to maintain quality or cost advantages in order to continue to be competitive in unstable international markets.

- **Products unique to New Zealand:** The final opportunity available to those considering landuse change in Taranaki is the development of industries based on crops that are not grown elsewhere, although the risks associated with such products are probably higher than for products in other categories. These products may be new and unique entrants to a broader international market or the establishment of a new market may be required. In general, the range of indigenous food sources is limited, and a small kumara export industry has been the only food crop example found. However, the Manuka honey industry, indigenous to New Zealand and based in Taranaki, has applications not only in the rapidly growing functional foods market, but also in the large international wound-care and cosmetics markets. Taranaki is the base for the Manuka honey Primary Growth Partnership (PGP), which is providing funding for a seven-year period to move the industry from wild harvest to a science-based farming system. While production technologies generally exist for these products, they may require further development for export markets, and the most significant challenges for the new industry are likely to be in the areas of consumer acceptance and the development of marketing channels.

3.3 COMPARATIVE AND COMPETITIVE ADVANTAGE AND INNOVATION

A major factor in selecting an enterprise for development in Taranaki is the extent to which the region has a comparative and/or competitive advantage over other production areas. The factors that must be taken into account in determining whether a region has a comparative advantage in particular crops/enterprises are the physical factors described in Chapter 2 and the extent to which the infrastructural requirements of the crop can be met in the region.

The competitive advantage of an industry will depend on the level of innovation and cooperation that exists across the whole supply chain including producers, processors, marketers, scientists, etc.

Greer et al. (2000) reported that the sources of innovation and information that have driven agricultural and horticultural industry development in New Zealand range from the enthusiasm of a small number of individuals or specific firms within an industry, to the research interests of particular scientists, or the diversification efforts of members of other agricultural or horticultural industries. Firms seeking new commercial opportunities may find them through careful market and technology analysis of a range of options. Understanding the opportunities for innovation and the development of competitive advantage early in the development of new industries may be vital if complications arising from the ownership of intellectual property and access to other important resources that can affect industry development are to be avoided.

For well-established industries this is relatively easy for the individual producer to assess. For example, in New Zealand the dairy industry has a comparative advantage over many of its competitors because of the country's temperate climate. This has facilitated the development of comparatively low-cost grass and forage based feeding systems, and means that it is not necessary to house stock during winter. There has been extensive infrastructural development; there are clearly defined marketing channels; and the industry has developed competitive advantage through innovation in production, processing, packing, distribution and logistics (Nesbit, 2011). An analysis of the economic returns to dairying on a regional basis (DairyNZ, various years) suggests that dairying in Taranaki enjoys a higher-than-average level of comparative advantage among New Zealand's main dairying regions. The chief disadvantage of the grass-based, non-housed production system employed in New Zealand is that the high levels of inter-seasonal variation in production means that the system requires greater



investment in milk processing facilities than a more constant supply (Harrington, 2005), but Taranaki is well-served with sophisticated infrastructure for dealing with seasonal production. The ease with which information on the potential comparative and competitive advantages of specific horticultural developments in Taranaki can be obtained will vary with the nature of the development.

While the existence of comparative and/or competitive advantage is a necessary condition for the success of any industry, other factors, which are described in the following sections, may be of considerable and even equal importance, and a sound understanding of these will be of value in selecting appropriate horticultural developments for Taranaki.

3.4 INFLUENCES ON THE SUSTAINABILITY OF DAIRYING IN TARANAKI

3.4.1 COMPETITIVE ADVANTAGE IN NEW ZEALAND DAIRY PRODUCTION

It is widely recognised that the New Zealand dairy sector enjoys a high level of comparative and competitive advantage that has enabled it to become New Zealand's largest export sector since the mid-1990s. The recently published industry strategy for sustainable dairying (DairyNZ, 2013) identifies the main attributes of the industry's historical competitive advantage as:

- Resilient, low-cost dairy farming systems;
- Skilled and motivated farm managers and staff;
- Plentiful access to fresh water resources;
- Export orientation;
- Reputation for product integrity and reliability;
- Growth and capital renewal.

The Business Growth Agenda of the New Zealand Government has challenged the agricultural sector to double the value of exports by 2025, and the dairy industry is a key part of the strategy for achieving this target (New Zealand Government, 2012). The new industry strategy has been developed in recognition of the importance of sustainable growth in dairying to the achievement of this target. For sustainable growth to occur in the industry the requirements of three key “pillars

of sustainability”, environmental responsibility, social responsibility and economic aspirations, must be met.

Achievement of the economic aspirations of the New Zealand dairy industry depends on the maintenance of New Zealand's traditional competitive advantage, and on international market factors such as continued growth in demand, exchange rates and climatic conditions in other exporting countries.

Several of the traditional areas of competitive advantage apply to the New Zealand dairy industry as a whole with no regional differentiation. They include New Zealand's export performance and the impacts of international market factors, climatic conditions in competing exporting countries, and New Zealand's reputation in export markets. In these areas the sustainability of dairying in Taranaki reflects the sustainability of dairy farming in New Zealand.

However, in two areas, resilient low-cost farming systems and plentiful access to freshwater resources, the Taranaki dairy industry has a comparative advantage over some other dairy regions, particularly Canterbury, which is heavily dependent on irrigation to maintain the high levels of production necessary for financial viability. Not only is the future allocation of freshwater likely to be limited in Canterbury, but for those reliant on pumping, costs are rising.

The industry strategy acknowledges the need for dairy farmers to manage the outcomes of dairying, both within and without farm boundaries, in four key areas related to the environmental and social responsibility pillars. These include the environmental impacts of dairying with particular emphasis on the impacts on freshwater; the welfare of dairy livestock; the welfare of farm employees; and the role of the industry in local communities. The environmental and welfare impacts of dairying in particular are the subject of considerable discussion in the New Zealand media, where “dirty dairying”,

inductions of calving, and the relative sustainability of housed and pasture-based production systems are all subjects of debate. It is clear that, at least in some regions, issues of water availability and nutrient levels may have a considerable influence on industry development, since nutrient caps and other mechanisms designed to protect freshwater quality also have the potential to reduce the financial viability of the industry in those areas.

3.4.2 THE DAIRY INDUSTRY IN TARANAKI

Dairying is the dominant type of farming in Taranaki, and Taranaki makes an important contribution to New Zealand dairy production. It is the fourth largest dairy region in terms of cow numbers and milksolids production, and produced 10 percent of national production from 10 percent of the national herd in 2011/12 (LIC and DairyNZ, 2012). In 2011/12 there were an estimated 484,000 cows comprising 1,971 dairy herds in Taranaki. Although there has been significant amalgamation of dairy farms during the last decade (see Chapter 3), average regional farm size remains the smallest in New Zealand at 100.4 hectares compared with 140.7 hectares nationally (LIC and DairyNZ, 2012). Amongst New Zealand's dairy regions Taranaki has the second lowest number of employees per farm at 2.6 full time equivalent staff members (FTEs) compared with the national average of 3.3 (Tipples and Greenhalgh, 2011).

Both production per hectare and, in recent seasons, production per cow, have generally been above the levels recorded in other North Island Regions (Dairy NZ, various years).

Operating profit per hectare in Taranaki has also generally been higher than other North Island regions (although lower than in newer dairy regions Canterbury and Otago), and in 2011/12 Taranaki dairy farms had significantly lower debt to asset ratios on average than those reported for other regions.

New Zealand's major milk processor, Fonterra, operates three milk processing plants in Taranaki. Most processing is undertaken at the Whareroa site, Fonterra's largest facility, which is near Hawera in South Taranaki. There is a cheese factory at Eltham in Central Taranaki and a by-products manufacturing plant at Kapuni (South Taranaki).

The dairy industry, including the processing sector, is the region's largest employer and accounted for 5,699 jobs or 10 percent of regional employment in 2011, and for the largest proportion (54 percent) of regional net job creation between 2009/10 (Infometrics, 2011). This represented 14 percent of national dairy industry employment in 2006. In addition, a number of Taranaki's other industries are closely linked to the dairy industry and the estimated employment multiplier for the region in 2006 was relatively high at 2.51. This means that for every new job in the dairy industry, 1.51 jobs will be created in other sectors (Leung-Wai, et al 2007).

The contribution of the industry to regional GDP in 2006 was 17 percent (Leung-Wai, et al 2007), which comprised 14 percent of national dairy GDP. No updated information on the industry's GDP contribution is available, since regional economic activity data is usually aggregated at the wider industry levels of Agriculture and Food and Beverage Manufacturing.

3.4.3 THE SUSTAINABILITY PERFORMANCE OF DAIRYING IN TARANAKI

Although it is not possible to complete a sustainability scorecard for the Taranaki dairy industry in the context of this study, several secondary information sources provide some insight into the performance of the Taranaki dairy industry with respect to three of the key areas identified in the industry strategy. No information on animal welfare that is specific to Taranaki was available.

Environmental performance:

The Taranaki State of the Environment Report acknowledges that the pressures imposed by modification of stream and wetland habitats for land development, and the impacts of nutrient run-off from pasture on water quality and soil compaction, will intensify with continued growth in dairying and will require on-going attention (TRC, 2009).



Diffuse-source discharges to freshwater, such as the discharge of dairy effluent, are recognised as a key challenge to freshwater management in New Zealand and Taranaki is well-endowed with fresh-water resources. Amongst the advertising images of New Zealand as a “clean, green” source of food products the iconic silhouette of Mount Taranaki is prominent, and the mountain is the source of more than 300 rivers and streams that flow down its sides to the sea. The ring plain is traversed by 6517 kilometres of waterway and almost every dairy farm is dissected by at least one stream (TRC, 2011).

The TRC has published two discussion documents outlining potential approaches to the preservation of water quality in the region in 2012 (TRC, 2012a; TRC 2012b), and has amended the Regional Freshwater Plan for Taranaki to include transitional policies that will apply until policies defining freshwater quality limits and targets become operative. Unlike several other regional councils, the TRC does not plan to implement blanket approaches to freshwater management, such as landuse consent requirements for dairy farms or nutrient trading schemes, as it considers that the necessary steps to ensure that water quality is maintained are being taken by an increasing proportion of farmers.

The TRC reports that water quality is “relatively good with mainly improving trends” (TRC, 2012a). Supporting evidence for this is provided by progress reports on the implementation of the Taranaki Riparian Management Programme and regional levels of compliance with dairy farm consent conditions related to effluent discharge onto land and water.

- The June progress report for the Taranaki Riparian Management Programme showed variability in the extent to which the programme’s targets were met or appeared likely to meet targets by the specified dates. The targets for riparian property plans; protecting stream crossings by means of bridges or culverts; farm dairy effluent discharge consents that complied with the Taranaki Regional Fresh Water Plan; and the fencing of regionally significant wetlands were met or exceeded. Only 0.04 percent of Fonterra supplier dairy farms had yet to implement nutrient budgets.

However, although progress has been made towards meeting the 2015 targets with respect to fencing streams (80 percent) and revegetation of streambanks (70 percent), the 2015 targets will not be achieved until 2020 at current rates of fencing and planting, (TRC, 2012c).

- The level of compliance with dairy farm consent conditions related to discharge onto land and water is consistently high at between 94 and 96 percent (Tim Payne, Taranaki Regional Council, pers. comm.). This contrasts with the experience in the neighbouring Waikato region, where 12 to 13 percent of farms have been found to have “significant non-compliance” during 2010/11 and 2011/12 and a similar proportion to be only “partially compliant” (McLay, 2012).

Soil health in the region is also good. While soil compaction has been identified as a potential risk associated with dairy farming in Taranaki, 97 percent of Taranaki soils are of very low to moderate vulnerability to soil compaction. Although, there is evidence of soil compaction on some Taranaki farms during wet weather, but this compaction is generally reversible with appropriate pasture and stock management. Taranaki Regional Council investigations have found that neither dairy farming nor sheep and beef farming in the region have caused long-term decline in soil nutrient levels, or elevated levels of fertiliser or agrichemical residues in Taranaki soils to date. The only nutrient found to have significantly elevated levels was total nitrogen, which was higher than optimal on all dairy farms surveyed, although most nitrogen is in the organic form which does not leach out of the soil as readily as inorganic forms (TRC, 2009a).

Animal welfare performance:

The Taranaki dairy industry is not differentiated from the wider New Zealand industry with respect to animal welfare. The New Zealand dairy industry recognises the importance of consumer perceptions of animal welfare in international markets and a number of initiatives have been implemented to address these issues at the industry level. These include the adoption in 2010 of a Code of Welfare (NAWAC, 2010), which provides guidance to dairy industry participants on the standards they must achieve order to meet their obligations under the Animal Welfare

Act 1999. However, the Code does not set targets with respect to changes in several welfare issues that have received media coverage in recent years, including the induction of calving, and shelter and housing.

The industry has been responsible for the development of animal husbandry skills-based training programs and a training and assessment process for assessing the body condition of livestock. An early response service has now worked with over 100 farmers assisting them to address potential animal welfare issues (DairyNZ, 2013).

Industry participants signed a memorandum of understanding (MOU) in June 2010, with the goal of reducing the number of induced abortions every year. Targets were established with respect to the maximum proportion of inductions per herd. The targets halved every year from 15 percent in 2010 to four percent in 2012 and have been met or surpassed in every year. The SPCA is encouraging the industry to work toward a two percent target but no decision has been reached on this as yet (Tocker, 2012).

Labour management performance:

A survey conducted among participants in AGITO courses (Tipples and Greenhalgh (2011) found that respondents from Taranaki dairy farms reported a greater sense of belonging to their farms than most other regions, and held higher opinions of the leadership qualities of their managers than the national average. Taranaki and Wairarapa employees are more likely to feel that they are able to raise any issue with their manager than employee from elsewhere in New Zealand; consider that they receive recognition and reward for good performance; and score their managers' people management skills most highly. They gave one of the highest scores overall to both their managers and their jobs.

It is interesting to note that while these scores were given in the context of working conditions that included the lowest number of cows per employee (155 compared with national average of 191), Taranaki dairy workers have the lowest number of days off per year and work longer rosters than employees in other regions.

Staff recruitment and retention have been identified as key issues in the New Zealand dairy industry, and the

industry is working to ensure skilled people are attracted to, and retained by, the industry. Both "churn" out of the industry, which has been estimated to be 15 percent per year (Taylor, 2011) and the turnover rate on individual dairy farm enterprises (over 90 percent per year) are of concern. In the Tipples and Greenhalgh survey Taranaki was reported to have the highest number of long-term dairy industry employees (> 12 years) of any region but, on average, the length of time respondents had spent working for their current employer was similar to the national average.

Role in the Community:

Chapter 3.4.2 outlines the importance of the dairy industry to the Taranaki community as an employer and contributor to regional prosperity. Tucker and Ryan (2011) summarised themes from the Puke Ariki 60 Springs Project, which comprised a number of projects, workshops and events, involving schools and community partnership organisations in order to engage the wider community in thinking about innovative solutions to a sustainable Taranaki. They reported that the dairy industry is regarded as very important for the regional economy and also contributes to a sense of community. Although the environmental impacts were well recognised there was recognition of positive change as farmers move towards more sustainable practices.

Anecdotal evidence from the interviews conducted for the current study supported this finding. The dairy industry's importance to the region was acknowledged by a diverse range of interviewees, including horticultural industry participants. Its role as a major employer, and the direct reflection of dairy industry performance in the prosperity of Taranaki towns such as Hawera, Stratford and Eltham, ensures that the community is widely supportive of dairying, although the associated environmental pressures are recognised.

3.5 TRENDS IN INTERNATIONAL HORTICULTURAL MARKETS

International trade in horticultural products has been increasing steadily since the 1990s. In volume terms export trade in fresh fruit increased by more than 60 percent between 2000 and 2011, and fresh vegetable



trade has almost doubled (Boon, 2013). During this period trade liberalisation has encouraged the expansion of trade in horticultural products, in response to a desire for healthier lifestyles in the West and a growing middle class in developing countries. In addition, consumers now expect a diverse range of fruit and vegetable products to be available year round. As it is not economically viable for individual countries to achieve year-round production of a wide range of horticultural products there has been an increased requirement for trade (Harrison, 2002). Many of New Zealand's horticultural industries derive significant value from market windows during which Northern Hemisphere supply is not available.

A number of key trends that will influence New Zealand's horticultural export industries in future have emerged in international markets. These were summarised by the Growing Futures project funded by Plant and Food Research (formerly HortResearch and Crop and Food Research), Zespri and New Zealand Trade and Enterprise (Martech, 2008). The first six of these, in particular, have been widely discussed in the literature. The trends include:

- **Consumer Power:** Internationally, supermarkets are emerging as the main link between the horticultural industry and increasingly-sophisticated consumers who are demanding an increasingly diverse range of products year-round. A relatively small number of international retailers are transforming the supply chain from "supply-push" to "demand-pull", which has critical implications for horticultural industry participants at all stages of the value chain. The key challenge for the industry will be to identify and commercialize product attributes for which consumers are prepared to pay premium prices, since there will be increasing pressure on prices in the future as fewer, larger, businesses control access to the higher income consumers. Innovation-based products will become increasingly important. In order to succeed, horticultural industries must develop long-term relationships with supermarkets (Hughes, 2006).
- **Convenience:** Consumers are increasingly demanding convenience in food products. Significant increases in

demand for value-added products such as fresh cut salad and vegetable products in customer-ready packs have occurred during the last decade. This reflects the creation of a market of consumers willing to pay for safe, convenient, high-quality, value-added products that has developed as a result of busier lifestyles, rapid urbanization and increased purchasing power, particularly in developed countries. (Cook, 2004; Roxas, 2008).

- **Health and Wellbeing:** The demand for food and food products that enhance human health and wellness is increasing as public health legislation shifts to ensuring that the individual takes more health responsibility. There has been increasing promotion of the benefits of diets high in fruit and vegetables world-wide. The demand for intrinsically healthy foods (functional foods) has experienced rapid growth in recent years, and has been credited with "invigorating the United States food industry" (PWC, 2009). Mellentin (2011) reported that the rapid growth of consumer and corporate interest in the health benefits associated with vegetable products is likely to become a key driver in the growth of many product categories. The trend towards health-related products, convenience products and value-added products represent a significant growth potential for new and novel fruit varieties meeting these demands.
- **Environmental Sustainability:** Consumers and, consequently, retailers have been increasingly concerned in recent years about whether food production practices are environmentally and socially sustainable. A large number of GAP (good agricultural practice) programmes have been developed by governments, industries and retailers worldwide, which that certify that environmentally sustainable practices are employed at the farm level and beyond. Issues such as "food miles" and "carbon footprints" will become more important with respect to horticultural exports as environmental and resource issues surrounding food production, packaging, storage and transport are targeted by special interest groups (Martech, 2008).

- **Food safety.** With the expansion of global trade in food, including fruit and vegetables, has developed increasing awareness of the need for food safety assurance, particularly in the wake of several well-publicised examples of food safety breaches in China. There is a growing desire for “safe” and “natural” foods, which is reflected in the growth of the organic food sector, and the certification and tracking of food production for safety reasons is increasing (GFSI, 2011).
- **Increasing Competition:** Trade liberalisation is leading to increasing competition in world food markets, and the development of export horticulture industries that take advantage of low labour costs, seasonality, and favourable natural resource endowments is widely discussed as a means of increasing income levels in developing countries (World Bank, 2005). As a result, traditional exporters will find it necessary to reduce costs as a means of staying competitive. Competition amongst food retailers is expected to diminish as fewer large supermarket chains dominate sales globally, increasing their power over producers.
- Other trends identified by the Growing Futures project included the customization of food to meet the needs of changing populations; the desire for “indulgence foods and products that meet the time, energy and health or leisure needs of consumers; the increasing use of internet-based systems for regulating and monitoring foods internationally; and the convergence of the food, health and biotechnology sectors to produce products such as “functional or fortified foods/nutraceuticals; vaccines delivered by means of food products; and new production technologies. (Martech, 2008).

A final trend that is of particular relevance to New Zealand horticultural industries is the development of new horticultural cultivars and better storage technologies in Northern Hemisphere markets. The out-of-season supply window into Northern Hemisphere markets has been the basis of the development and/or expansion of several export industries and continues to be of considerable importance to them. (Horticulture New Zealand, 2009).

In response to these trends the New Zealand horticultural industry has signalled that it is time to refocus on key areas including value-added products, niche markets, and areas in which the industry has developed marketable intellectual property (Horticulture New Zealand, 2009).

It acknowledges that “a successful future will not and cannot be based on increased volumes and areas planted in commodity products, because of the increasing competition from producers whose costs of production and delivery to market are lower than ours in both domestic and export markets”. In the industry strategy for doubling export value by 2020 four key industry outcomes have been. They include:

- Build global competitiveness;
- Dominate product categories within target markets;
- Create value, commercialise products and control intellectual property;
- Set the standard for sustainably produced products (Horticulture New Zealand, 2009).

3.6 COMPLEMENTARITY WITH OTHER ENTERPRISES

A significant consideration for potential investors in new agricultural/horticultural enterprises in Taranaki may be the extent to which a new enterprise fits with the existing enterprises, management systems and skills associated with an existing property, or with new or existing enterprises in the area. An area of complementary development of increasing importance in Taranaki is the provision of support to the dairy industry.

Complementarity may occur both before and after the farmgate. On-farm and off-farm, the development of new horticultural enterprises can be facilitated if the new enterprise uses skills and knowledge developed in existing enterprises, or if the labour demands of the new enterprise occur during non-peak periods for existing enterprises. Off-farm, complementarity may occur if the new enterprise can use existing infrastructure during



periods in which it has been unused (for example, kiwifruit and avocados share packhouse facilities in other regions), or if additional volumes of similar products reduce transport costs.

A recent Dairy NZ survey (Tarbotton and Bell, 2012) reported that 48 percent of Taranaki dairy farmers considered farm succession planning to be a priority during the next two or three years. In the Bay of Plenty, a number of kiwifruit orchards have been developed on dairy farms as a diversification and succession planning strategy (Greer and Saunders, 2012), thus allowing properties to support more than one family. However, diversification was not among the options for succession discussed by Tarbotton and Bell (2012).

3.7 THE POLICY ENVIRONMENT

New enterprise evaluation cannot be undertaken in isolation from the trends in the wider policy (central and local government) environment. Greer et al. (2000) observed that the policy environment and incentive structures created by government can influence the rate and nature of industry development and expansion. Policy trends can also alter the relative returns to individual industries. In New Zealand agricultural policy has been market-orientated since the mid-1980s and Government's involvement has been in working toward freer trade internationally, rather than in offering strategic direction to New Zealand industry via export or input subsidies. However, overseas policy trends may influence outcomes for New Zealand export industries. Subsidies to producers of products competing directly with New Zealand exports in world markets reduce the competitiveness of New Zealand industries. The removal of market barriers such as quotas and tariffs has a positive impact on the outlook for New Zealand's primary products.

While it does not provide incentives for increased exports, the Business Growth Agenda (New Zealand Government, 2012) has provided a spur to the country's horticultural industries to increase the value of exports significantly during the next few years. While most sectors are focussing on increasing value-added by their industries, there are also plans to increase production over the period.

An increasing level of constraint in the practices implemented on New Zealand farms will be imposed by, or agreed on, under environmental policies at both the regional and national levels. The dairy industry, in particular, has been increasingly affected by such constraints, including the constraints imposed on the management of dairy effluent, the exclusion of livestock from waterways, nutrient budgeting and water restrictions. Such regulations may affect land-use decisions if the relative net returns to different industries are altered by the restriction of farming activities, or if incentives or disincentives not related to the markets for the products of the industry are created. However, the dairy industry in Taranaki is comparatively unregulated at present, and no such constraints to horticultural development in Taranaki have been identified in this study.

Limits on the extent of subdivision or on the nature of activities permitted in particular areas may adversely affect the development of new enterprises in those areas. In the New Zealand primary sector small-holders have played key roles in the development of several horticultural industries, as a result of their willingness to invest time and money producing products in a high-risk environment with no guarantee of commercial returns. However, discussions with local government representatives in the three districts that comprise the Taranaki region suggest that local government policies are unlikely to impose significant constraint on horticultural development in the region.

3.8 ACCESS TO INFRASTRUCTURE

The infrastructural requirements of individual industries are often specific to individual industries, or groups of like industries. Access to infrastructure is likely to be a significant issue for new horticultural developments in Taranaki because of the very small horticultural industry presence in the region at present, and because Taranaki is not on main transport routes. Saunders et al (2011) identified a number of infrastructural requirements for new industries on the West Coast, which also apply to horticultural industries in Taranaki:

- Suppliers of plant and machinery for cultivation, irrigation, pest and disease control, harvesting etc.;
- Processing/packaging capacity – seed cleaning, dairy processing; freezing; canning, etc;
- Storage capacity – coolstores, grainstores, etc.;
- Transport – airports, ports, road transport operators, etc;
- Distribution capacity – wholesalers, exporters, auction facilities (physical and on-line);
- Labour force – access to skilled workers and/or workers willing to be trained to meet harvest and other labour requirements;
- Education – opportunities for on-farm and institution-based worker training;
- Expertise – access to consultants and others with experience in the management of a range of crops and businesses;
- Research and development facilities.

Infrastructural constraints on the development of horticulture in Taranaki are discussed in Chapter 4.2.

3.9 INDUSTRY STRUCTURE AND LEADERSHIP

The leaders of successful new horticultural industries in New Zealand, and those who have extended existing industries into new regions, have often been strong individuals with a passion for the new enterprise that is based on specific market demand, rather than on the production possibilities. Greer et al (2000) reported that “leadership and singularity of purpose amongst a core group of players in infant industries, or even a single individual, can assist industry development by creating appropriate institutions to cope with the challenges that

are to be faced in the future”. Such groups and individuals are often referred to as “industry champions”. In more mature industries, industry structure and relationships are likely to be more important than the industry champion.

Some important aspects of industry structure for new entrants to consider include:

- Whether there is a formally recognised body representing the interests of industry participants; informal relationships amongst industry participants working towards a common good; or industry domination by a small number of large players.
- Whether there is collaborative investment in industry good activities such as research and development or whether these activities are confined to individual firms within the industry.
- Relationships between marketers/exporters and producers, formal (e.g. single main exporter, grower cooperatives; limited number of licensed exporters, numerous competitive individual exporters, etc.
- The number and relative size of firms within the industry.

3.10 MARKET DEVELOPMENT, PROMOTION AND BRAND PROMOTION

The long-term profitability of any primary sector enterprise is likely to be influenced by the opportunities for sophisticated product and brand development for the enterprise itself, or the industry within which it exists. There is a considerable amount of information available on the marketing, branding and promotion efforts in New Zealand’s well-established industries. For emerging industries the opportunities for brand development and sophisticated marketing programmes at the firm or industry level will depend on:

- Whether the product has points of difference that consumers will be able to identify;
- Whether those product attributes can be maintained consistently over all product and in all seasons. Saunders et al. (2011) observed that such consistency is often extremely difficult to achieve in agricultural and horticultural products because of the inherent variability associated with seasonal impacts, and between growers across and industry.



Generic promotion of a product and general market development activities associated with introducing the product into new sectors of the market are the most common forms of marketing activity undertaken by emerging industries. Activities are often related to international trade rather than promotion to consumers. The level of this type of activity is largely driven by the growth in total production of the industry and is likely to increase as the industry matures (Greer et. al., 2000).

3.11 SUMMARY

Greer (2012) identified a number of questions that should be asked and answered by those considering horticultural development in Taranaki. Successful horticultural development in Taranaki does not require that all of the following conditions are met. However, a clear understanding of how these issues will be dealt with, individually or collectively, will be of value in understanding the process of new enterprise establishment.

- Is there an **efficient production system** established for the product that will be applicable to Taranaki conditions and/or what would be required to adapt the production system for local conditions? (i.e. the production technology is established, labour requirements can be met, the quality/quantity of genetic material is not limiting production and there are no major technical barriers to on-farm efficiency).
- Is **efficient processing and value adding capacity** accessible? (i.e. the technology is in place, there is a labour force skilled in its use and throughput levels are sufficient for efficiency). If this is not the case in Taranaki, how could access to that capacity be achieved?
- Is there a **product description and quality assurance system in existence?** (i.e. key quality attributes desired by consumers are identified and quality assurance systems, standards, etc. established to ensure that these are met without making compliance so difficult that producers seek other outlets).
- Have **efficient trading and distribution mechanisms** been established and are they accessible to Taranaki producers at acceptable cost? (i.e. the infrastructure for trading and distribution exists and is, preferably, shared with other industries to minimise costs);
- Is there an **effective market development programme** in the wider industry to develop market demand at the level and rate of growth of supply and to ensure that export protocols are in place?
- Is there a **brand orientated marketing programme** based on a strong quality assurance programme and marketing strategy?
- Can **all product be disposed of economically?** (i.e. clear market information is available to ensure that new industries develop at the rate and to the level required by world markets and may require development of an economic method of adding value to lower valued product if this is significant for an industry).
- Is there a process for managing the **transition from the industry development phase to maturity, which ensures the industry does not collapse** when breeding stock (plant or animal) prices decline to the productive value of that material in the longer term?
- Are there adequate **funding and mechanisms for research and development** including technology transfer and the networking amongst growers that facilitates skills development?
- Is there an **industry structure** which brings together key players working toward industry development? This structure may be a formal industry organisation well supported by industry participants; a less formal grouping initiated by one or more key players with the co-operation/involvement of others; or determined individual(s) who motivate others to work for the industry good.
- **Is there any similarity to existing industries** that will enable technology sharing, collaborative research effort, or reduce the effort required to develop and implement new systems (audit, inspection, etc.) have been identified.
- What are likely **attitudes of mainstream industry participants and service providers (e.g. banking industry)**, particularly those in the region, to new types of enterprises?

Horticultural Development in Taranaki – Constraints and Potential

4.1 CURRENT STATE OF HORTICULTURE IN TARANAKI

4.1.1 PRODUCTION TRENDS

Taranaki is amongst the smallest regions in New Zealand with respect to fruit and vegetable production. There is no individual crop area large enough to be included in the annual summary of regional horticultural (Plant and Food, 2012).

Horticultural production in Taranaki has declined during the past decade, and it has been concluded on the basis of the interviews conducted for this study that production of many of the fruit and vegetable crops grown in the region is likely to decline further in the short to medium term. The Agricultural Production Statistics of 2000 (Statistics New Zealand, 2000) reported that there were 370 hectares in horticultural production in that year, excluding the area producing ornamental trees and shrubs, which was known to be substantial. This included 222 hectares of outdoor vegetables (almost 70 percent asparagus); 138 hectares of outdoor fruit including berryfruit, olives and nuts (nuts comprised 41 percent of area and tamarillos 16 percent); and 10 hectares of covered crops (mostly flowers). There were 51 plant nurseries in the region, 48 cut flower and seed growers; and 27 market gardeners, and a total of almost 200 horticultural producers. In 1999 Haylock estimated that the total area in horticulture was between 650 and 800 hectares, and that the most widespread horticultural uses were market gardening, the production of ornamental crops and asparagus production.

Since that time there has been a significant reduction in the areas of fruit and vegetable production reported (79 hectares and 23 hectares of fruit and vegetables respectively). However, as the areas of some crops have not been reported for reasons of confidentiality, the totals can be expected to be a little higher than those reported. None of the indoor crop areas were reported for confidentiality reasons, and flower and ornamental plant production is no longer included in the census (Danny Ren, Statistics New Zealand, pers. comm.).

For the purposes of this study, discussions were held with current or recent growers of 22 individual crops.

While ornamental, flower, and seed growers grow for both the export and domestic markets, most of the fruit and vegetable growers interviewed service only local and/or domestic markets. Growers interviewed grow a diverse range of crops including:

Avocados	Industrial hemp
Berryfruit (strawberries, raspberries, boysenberries)	Kumara
Blueberries	Lavender
Capsicums	Macadamia nuts
Feijoas	Manuka honey
Flower and vegetable seed	Orchids
Garlic	Ornamentals
Golden passionfruit	Kumara
Herbal teas	Tomatoes
Herbs	Vegetables (market gardening)
Hydroponic lettuce	

Not only has total horticultural production declined, but the area of every individual crop reported has also decreased since 2000.

Examples of horticultural industries that have ceased, or almost ceased, to exist in Taranaki, and the reasons for that decline that were reported by industry participants, include:

- The kiwifruit industry was well-established in Taranaki until the late 1980s when Cyclone Bola destroyed orchards and some packing infrastructure. The storm, in conjunction with the industry collapse in the same period, reduced regional confidence in the industry, which has never been recovered;



- The number of market gardeners has declined over the last 15 years from approximately 15 to two (Pogal Moratti, Ruakiwi Gardens, pers. comm.), and there are not likely to be any remaining in five years' time. Factors that have contributed to the decline of the market garden industry include an inability to compete for leasehold land with the dairy industry and rural residential development, and the higher returns to be received from the less physically arduous activity of growing maize for dairy support on land previously used for vegetable production. Declining margins in vegetables grown for the domestic market reflect the increased power of supermarket retailers;
- The asparagus industry was the largest vegetable industry in the region in 2000, but only one grower remains. The New Zealand asparagus industry declined by over 50 percent during the first half of the decade, primarily as a result of poor product returns to growers relative to the capital cost of establishment, and the increasing value of land adjacent to large urban areas for either lifestyle uses. There is little likelihood that the industry will be re-established in the region. While Taranaki soils are suited to the production of asparagus, the crop is wind-sensitive, and it is likely that future expansion will occur in existing production regions where infrastructural requirements can be met (Peter Falloon, Research Manager, New Zealand Asparagus Council, pers. comm.);
- Taranaki is recognised as having a comparative advantage in ornamental production. In the past it was the home of the largest ornamental plant nursery in the country, Duncan and Davies, but the original company went out of business in 2004. The company's demise could be attributed to several factors (Jim Rumbal, Plant Breeder Duncan and Davies, pers. comm.), including:
 - i. Changing economic conditions in domestic and export markets during the 1980s:** Unprecedented interest rates in New Zealand increased the costs of capital following a significant expansion of the company, and depressed economic conditions in the United Kingdom led to reduced demand in an important export market. Tighter biosecurity

regulation in the United States market made market access more difficult and costly;

ii. Erosion of Taranaki's comparative advantage in the open-ground propagation of ornamentals:

The availability of cheap growing bags, potting mix made cheaply from shredded *Pinus radiata* bark, and overhead irrigation technology facilitated production in other regions closer to main markets, and the reduction in rail freight services in New Zealand and subsequent reliance on road freight increased costs significantly and reduced profitability;

iii. Increased competition in the domestic market:

A proliferation of garden centres in the 1970s and 1980s that grew their own stock increased competition in the domestic market, exerting downward pressure on prices, further reducing profitability;

iv. Lifestyle trends: Modern trends for busier lifestyles and small gardens increased demand for "potted colour" and smaller plants at the expense of trees and shrubs.

Since Duncan and Davies went out of business, a number of plant nurseries of varying size have been established in Taranaki, mainly by former staff of Duncan and Davies, and from the discussions held for this study the current area is known to exceed 100 hectares.

- Although there were several blueberry orchards in the region at the end of the 20th century, some of which produced for the export market, only one small local-market orchard is still in operation. The reasons why this industry did not survive in the region were varied. Some orchards did not survive periods of reduced prices; some growers retired after a long involvement in the industry but did not sell their orchards; and some developments were undertaken in areas where soil conditions were not suited to blueberry production.
- Commercial feijoa production in Taranaki is also reported to have ceased. Poor economic returns for export fruit; the mid-seasonality of production in Taranaki which meant there was no beginning or

end-of-season window during which growers from the region could capture high returns; and pressure on domestic margins from supermarkets all contributed to an on-going lack of profitability.

Only two industries that have significant expansion potential in Taranaki were identified during the study. These were the developing Manuka honey industry and industrial hemp industries which are discussed in later in this chapter.

4.1.2 MOTIVATION FOR HORTICULTURAL DEVELOPMENT IN TARANAKI

Much of the horticultural development in the Taranaki region has been undertaken as a combined lifestyle and commercial venture, and several of those interviewed had recently left the industry, or were proposing to do so in the near future. They did not intend to sell their businesses as going-concerns, either because they do not consider that there is prospect of doing so, or because they do not intend to move.

The motivation for most of the development of horticultural enterprises in the region has been related to individual interests, and few interviewees reported that they had an interest in industry development, or had worked actively to achieve that.

Exceptions were the Manuka honey and industrial hemp industries, which are being actively promoted in the region (See Chapter 4.3.3). Although the Taranaki Fruitgrowers Association exists on paper, in fact the organisation has been inactive for approximately 15 years (Peter Hockings, past Secretary, pers. comm.). The Taranaki Vegetable and Produce Growers Association continues to exist, but has few formal activities and a very small membership (Russell Jordan, President, pers. comm.).

Survey participants were asked why, given the limited horticultural development in the region, they had chosen to establish a horticultural enterprise in Taranaki. For most, the reasons were personal i.e. “Taranaki born and bred”, rather than based primarily on the suitability of

the region for the enterprise. Only growers of ornamental plants and covered crops reported that comparative advantage was a primary motivation for development in Taranaki.

Horticulture has provided opportunities for diversification and succession planning for a small number of Taranaki dairy farmers (two orchid growers identified during the study), but Taranaki dairy farmers are more likely to consider amalgamation rather than diversification (Kelly Langdon, Regional Policy Advisor, Federated Farmers Taranaki, pers. comm.)

The failure of the kiwifruit industry in Taranaki, followed by the reduction in the numbers of growers in many industries appears to have eroded local confidence in the region’s ability to support horticultural production.

4.2 CONSTRAINTS TO HORTICULTURAL PRODUCTION IN TARANAKI

During the interviews conducted for the study, growers identified a number of constraints to horticultural production in Taranaki, which were explored where possible with representatives of the finance industry, valuers, infrastructure providers and other professional advisers. While there are few constraints imposed by local and regional authority plans on horticultural development in the region, interviewees reported that high land prices; lack of infrastructure; unavailability of finance and inadequate skilled labour have imposed constraints on some horticultural businesses.

- **Regional and district planning:** Few restrictions on horticultural development are imposed under regional and district plans in Taranaki. Under the Taranaki Regional Plan a wide range of farming activities (including horticultural activities) may be undertaken without a resource consent providing regional plan conditions with respect to activities that may have adverse environmental impacts are met (Don Shearman, Land Services Manager Taranaki Regional Council, pers. comm.; TRC, n.d.). These include several activities of relevance to horticultural development in the region:
 - i. Chemical weed and pest control is permitted without consent as long as registered pesticides are



used, drift is controlled, and rainwater household water supplies are not affected. Aquatic weed control is also a permitted activity provided under similar conditions except where the area has been identified as a significant wetland;

- ii. Fertiliser application does not require a resource consent provided the products used are MPI-approved and drift is minimised;
- iii. Wells and/or bores can be drilled for farm water supplies provided they meet the requirements with respect to casing and sealing bores, and the location of bores/wells in relation to the location of effluent treatment ponds, septic tanks, silage pits, other bores and the high tide mark;
- iv. Groundwater may be taken from a well or bore as long as the abstraction rate is less than 50 cubic metres per day, salination will not occur and the level of adjacent wells will not be lowered significantly.

In all three districts of Taranaki there may be special land features that may affect proposed developments. These include existing archaeological sites, significant natural areas, etc. In these cases it may be necessary to obtain resource consent from District Councils, as well as the approval of the New Zealand Historic Places Trust, local iwi, etc.

Stratford District plan identifies four zones: Residential; Business; Rural Residential and Rural. Horticultural development may be undertaken without resource consent in the two rural land zones provided performance standards are met with respect to heavy vehicle movements, activities within erosion prone land, etc., (Pat Moore, Regulatory Manager, Stratford District Council, pers. comm.). Resource consent would be required for development in the Residential or Business Zones.

A similar situation exists in South Taranaki District where horticultural development may be undertaken without resource consent in the Rural, Rural Industrial and Industrial Zones, but consent is required for development in the Commercial and Residential Zones (Maria Cashmore, Planner, South Taranaki District Council pers. comm.).

In New Plymouth District each of the five zones identified in the district plan (Rural, Open Space, Business, Industrial, and Residential) has different rules with respect considerations of noise, traffic, etc., so the constraints on development will differ with the nature of the enterprise. Generally, development without consent would be possible in the Rural zone and may be possible in the Business and Industrial zones.

- **Land price:** Most of the growers interviewed reported that they believe the high price of land suitable for horticulture in Taranaki discourages new industry entrants. The exceptions were the owners of seed and ornamental businesses who observed that similar sites in Auckland, closer to export infrastructure, are considerably more expensive than the sites they currently occupy.

Land prices reflect the nature of the competing landuses including dairying, which is widely regarded as the highest and best use of much of the land in the region, and small rural holdings (lifestyle blocks). The primary influence on the price of rural small-holdings, particularly those in close proximity to New Plymouth has changed in recent years. In the past, retiring dairy or sheep and beef farmers were the most frequent purchasers of small rural blocks. However, since the expansion of the oil and gas industry, affluent oil and gas industry employees from overseas often purchase a smallholding close to New Plymouth for the duration of their time in New Zealand. This has led to an increase in demand for these properties and exerted upward pressure on prices (John Larmer, Director Telfer Young Taranaki).

The value of bare land suitable for dairying in the region varies with altitude and other physical attributes from \$25,000 per hectare up to \$50,000 per hectare or more (John Larmer, Director Telfer Young Taranaki). Taranaki's dairy industry is characterised by small farm size and a high proportional of inter-generational family farming businesses. There is strong competition for dairy land that does become available in order to increase farm size and facilitate succession.

The Taranaki market for small-holdings is characterised by extreme variability, with respect

to a range of factors including proximity to the city, whether the property has a sea view, floodability, etc. The bare-land prices of rural small-holdings (of approximately 10 hectares) vary from \$70,000 for a good property that does not have the advantages of proximity or sea view, to \$100,000 or more per hectare for a block of similar size in an area such as Airport Drive, in which there are small number of horticultural holdings. Per hectare prices are lower for larger blocks (Tony, Welsh, Quotable Value New Zealand – Valuer New Plymouth, pers. comm.).

Information on the sale prices of existing horticultural units was not available, since such sales are rare in the region. However, Tony Welsh expressed the view that the added-value of developments such as nut plantations would be unlikely to be fully captured in land prices.

The purchase of land for horticultural development would impose a heavy debt servicing cost on fledgling businesses, even before any on-farm infrastructural development. This constraint would be particularly challenging for a potential industry entrant proposing to grow a crop that requires several seasons before a full harvest can be realised, particularly if the block did not have existing shelter. However, prime horticultural land is also expensive elsewhere in New Zealand and prices in Taranaki are not considered to be markedly higher (Tony, Welsh, pers. comm.). A brief internet examination of prices for bare land suited to horticultural development in the Waikato and the Bay of Plenty support this view.

- **Infrastructure:** Taranaki is poorly served with respect to most of the infrastructural requirements identified in Chapter 2. Agricultural sector infrastructure in the region is limited to the sophisticated dairy industry infrastructure and to meat processing facilities, while existing horticultural enterprises have access to few of the requirements identified by Saunders et al. (2011) in the region. None of the major suppliers of horticultural inputs have a regional presence, and most of the processing/packaging capacity that does exist has been developed by individual growers for

their own enterprises, which do not have sophisticated requirements for packing, coolstorage, etc. The only industry to have developed such capacity in the past was the kiwifruit industry. At least three packhouses had been established in the region by the late 1980s, including one operated by the largest kiwifruit post-harvest operator, SEEKA. As a result of the damage inflicted on the industry by Cyclone Bola, compounded by the effects of the industry downturn at that time, all of these facilities cease operation.

Taranaki's regional transport infrastructure is also limited, and has been identified as a key area for improvement to facilitate economic development in the region (see Chapter 1). While Taranaki has a deep water port, it has rarely been used to transport horticultural produce. It would be possible, in theory, to export horticultural products in part-container consignments, but in practice scale is a key pre-requisite for cost-effective container shipping, which is the reason why even the dairy industry is moving all export operations from Port Taranaki to the Port of Auckland (Roy Weaver, CEO Port Taranaki, pers. comm.). Several interviewees reported that improvements in coastal shipping would be of value to horticultural producers in the region.

While road freight is available, the logistics of securing freight at the times required are difficult for some growers, particularly those who produce perishable products that require cool storage within a set time, such as avocado growers. Road freight providers acknowledge that freight delivery schedules do not always meet the delivery demands of producers, (Tony Martin, Branch Manager, Express Group, Taranaki, pers. comm.) but until an industry reaches sufficient size to warrant dedicated services, or groups of growers of different products that have similar requirements collaborate, this is unlikely to change. At present most freight services to Taranaki are provided by trucks based elsewhere, which stop in New Plymouth to unload and reload only. Small growers are disadvantaged in terms of transport costs (Allan Court, General Manager Express Couriers, pers. comm.) but cooperation amongst groups of



growers may make it possible for them to secure more competitive rates.

Container rail freight services are available from New Plymouth to container transfer sites at Auckland and Palmerston North and from there throughout New Zealand (Catherine Ellett, Customer Service Manager - Domestic, KiwiRail, pers. comm.). However, the small scale of horticultural development in the region means that container transport is not justified, and even collaboration between growers of similar products is unlikely to change this. All of the growers interviewed transported products by road freight services.

Major research providers to the horticultural sector have little science presence in Taranaki. Plant and Food Research is the main provider of research and technology services to the horticultural sector, and has research stations located in main areas of production. The absence of significant horticultural production in Taranaki has meant that Plant and Food has had little involvement in the region to date, with the exception of some individual projects that include the new crops assessment completed by Burge et al. (2000), as well as some crop seeds trials. However, Plant and Food Research is open to approaches from industry participants in Taranaki seeking research services (Declan Graham, Business Manager Bioprotection, Plant and Food Research, pers. comm.). Similarly Lincoln University is not routinely involved in research for the horticultural sector in Taranaki, but provides research services on a commercial basis to a diverse range of clients.

Massey University is the science provider to the medicinal Manuka honey Primary Growth Partnership between the government and industry partners Manuka Research Partnership (NZ) Limited and Comvita Limited, which are based in Taranaki. The partnership will fund a seven year research project with the aim of increasing the value of the New Zealand Manuka honey industry to \$1 billion annually. In 2012 the estimated annual industry value was \$20 million (Coriolus, 2012).

Opportunities for horticultural education in Taranaki are limited to a small number of courses at the Western

Institute of Technology. No horticultural consultants have been identified in the region and some growers report that they have engaged consultants from other regions at considerable cost, and/or travelled to field days and other extension events.

- **Availability of finance:** A number of interviewees considered that they had had considerable difficulties in obtaining the finance required for horticultural development or that they did not believe they could have obtained the finance required had they undertaken development in today's economic climate. They agreed with the opinion of one that "the banking industry in Taranaki cannot see past dairying as a rural landuse ... don't understand horticulture and have no interest in it". A number of those who expressed these views had undertaken developments that were new to the region and/or undertaken development as a combined lifestyle and business combination. Other interviewees, who had purchased or established business on a purely commercial basis, believed that investment proposals had been evaluated on individual merit and reported excellent relationships with financiers. Financing the development of a horticultural business in conjunction with an established dairy farm may be expected to be comparatively easy because of the existing asset base. Two representatives of the banking industry in Taranaki were interviewed. Both reported that they had received very few applications for finance for horticultural developments. However, both considered that horticultural proposals would be evaluated on the same basis as any other commercial proposition. Provided that the banks' requirements for economic viability and security were met, funding would be approved (Tony Burgess Rural Manager, Rabobank New Plymouth, pers. comm.; Fulton Hughes, Rural Manager ANZ National Bank Hawera, pers. comm.).
- **Availability of labour:** Unemployment in Taranaki is comparatively low (Infometrics, 2011) but most of the growers interviewed reported that they had had little difficulty in securing suitable labour for their enterprises. However, most were small businesses and/or could offer year round work to employees.

Several interviewees noted that while they had been able to employ sufficient labour, access to the skilled labour that they require is often limited. A significant expansion of horticulture in the region may well lead to a shortage of horticultural labour in the region, particularly as several studies (e.g. Greer and Saunders, 2012) have found that unemployed New Zealanders are not enthusiastic about seasonal work in horticultural industries. In other regions, the Recognised Seasonal Employment (RSE) Scheme facilitates the employment of Pacific Island workers during peak seasons in the horticultural and viticultural industries elsewhere in New Zealand and there is no reason why these workers could not also be employed in Taranaki, if appropriate housing and training were provided.

An additional constraint to new niche or artisan development in the region is that there is insufficient horticultural development to provide opportunities for between-industry synergies and synergies between horticulture and the local tourism industry. In other parts of New Zealand producers of olive oil, a range of summerfruits, nuts, specialist cheeses, etc., collaborate with others including local wine producers, to showcase regional products (Greer et al., 2012). Local cafes showcase regional horticultural products and restaurants develop menus based primarily on regional food and beverages.

Tourism is a growing industry in Taranaki, and visitors report that they visit Taranaki for Mount Taranaki and the Egmont National Park; walking and tramping; surfing and the coastline; history and culture; parks and gardens; and arts and crafts (Venture Taranaki, 2009). The region hosts several major entertainment events including the World of Music Arts and Dance (WOMAD), the Taranaki Rhododendron and Garden Festival, the Festival of Lights, the Festival of Arts, and sporting events including cycling and surfing competitions. The Regional Council manages three regional gardens (Hollards, Pukeiti and Tupare gardens), which it is actively developing in order to support Taranaki's reputation as the "garden province" (Greg Rine, Regional Gardens Manager, Taranaki Regional Council, pers. comm.). The Venture Taranaki Tourism

leader has held discussions with local members of the Hospitality Association of New Zealand and the New Zealand Chefs Association about showcasing Taranaki produce, and about staging a charity dinner using Taranaki produce as a theme. Although those attending these discussions expressed enthusiasm for the concept, no progress in this area has been made to date (Paul Stancliffe, Venture Taranaki Tourism Leader, pers. comm.).

One interviewee, who had developed processing technology, had experienced considerable difficulties in obtaining resources and advice on the process of licensing intellectual property in international markets in Taranaki.

4.3 OPPORTUNITIES FOR HORTICULTURAL INDUSTRY DEVELOPMENT

In Chapter 2 the opportunities for horticultural development were categorised in terms of the nature of their markets and current production status. Evaluation of the opportunities for horticultural development in Taranaki on this basis has been restricted to three of these categories. There are no horticultural crops grown in scale in Taranaki, and neither this study nor the earlier study of new crops (Burge et al., 2000) identified opportunities for expansion of industries based on products unique to New Zealand for which there are no existing international markets, with the exception of manuka/kanuka oil.

4.3.1 PRODUCTS FOR ESTABLISHED MARKETS NOT GROWN IN SCALE IN TARANAKI

Although a diverse range of fruit and vegetable crops is grown in Taranaki, there appear to be few opportunities for expansion of these. Areas of fruit and vegetable crops have been in decline for some years.

Fruit products:

New Zealand's major fruit industries, in terms of the value of exports in 2012, include the wine industry (\$1,171); the kiwifruit industry (\$1,045 million), the pipfruit industry (\$342 million); the avocado industry (\$97 million); and the summerfruit industry (\$32 million) (Plant and Food 2012). These industries all have considerable investment



in infrastructure in major growing regions; are exporting to established markets; and have well-defined industry structure and leadership.

The climatic conditions that make Taranaki well-suited to dairy production (regular rainfall; lack of extreme climate variability) are also those that make the region unsuited to wine production (Phillip Gregan, CEO, New Zealand Winegrowers pers. comm.). Industry expansion is expected to be limited to the east coast of both islands.

Kiwifruit is a high value crop that has been grown successfully in Taranaki in the past, but it is unlikely that the region will experience a significant increase in kiwifruit production in the medium term. The Taranaki industry did not recover after Cyclone Bola and the kiwifruit industry downturn of the 1980s, despite the large increases in production experienced in other regions since that time. It is believed that only one kiwifruit orchard remains in the region. Although the kiwifruit industry has the ambitious target of tripling export values by 2025 (Zespri, 2011), the industry's regional projections for increased areas of kiwifruit production do not include Taranaki (Shaun Gardner, Management Accountant, Zespri, pers. comm.). While it would be possible to freight kiwifruit from Taranaki for packing in adjacent regions, the costs of doing so would be high, and the lack of post harvest infrastructure makes kiwifruit development unlikely.

The pipfruit industry has not had a significant presence in Taranaki. Survey interviewees reported that two apple orchards, producing for the local market and a single nashi orchard exist in the region. Although the industry has plans for expansion to meet the Business Growth Agenda target of doubling exports by 2020-25, it believes that this target can be met in existing production regions. The lack of post-harvest infrastructure in the region make export pipfruit development unlikely (Mike Butcher, Technical Manager Pipfruit New Zealand, pers. comm.)

Avocados comprise the largest horticultural crop in the region by area, and avocado industry development in Taranaki would be possible under irrigation. David Green (Avocado Industry Council Director; New Zealand Avocado Growers Association "Rest of New Zealand" representative) considers that while transporting

avocados to the Bay of Plenty for packing would add to costs, it would not preclude development. The lack of other infrastructure including consultancy services and contract spray services are issues that could be overcome if the 20 growers in the region wished to fund these services collaboratively, but a recent attempt to organise this did not succeed.

Taranaki conditions are not suited to summerfruit development since the crop is adversely affected by windy conditions and fruit flavour development requires cool nights. Rain at harvest is likely to damage the fruit, which is also particularly susceptible to hail damage.

A number of small fruit industries (the tamarillo, feijoas, berryfruit, blueberry, etc. industries) are also represented in Taranaki, but the areas of most of these have declined during the last decade, and none stand out as providing an area of potential development in the future. Future development, if it occurs, is most likely to be small in scale, intended for local market production, and reflect the interests and lifestyle aspirations of individual growers.

The vegetable industries:

The physical environment of Taranaki is well suited to the production of a number of vegetable crops, but vegetable production, even for the domestic market, has declined in recent years. The only vegetable crop grown in sufficient scale in the region to be recorded in the most recent agricultural production statistics (Danny Ren, Statistics New Zealand pers. comm.) was potatoes, of which only 23 hectares were harvested.

New Zealand's major vegetable export crops include processed potatoes (\$102 million), frozen and dried peas (\$84 million), squash (\$65 million) and onions (\$62 million). Like the major fruit industries, major vegetable industries have established product groups under the umbrella of Horticulture New Zealand and have developed infrastructure and export markets.

Although potato production is possible in Taranaki, only a very small area is grown in the region, and most processing capacity is located in Canterbury and Auckland. Expansion of the potato industry is limited

by the low returns received by process potato growers in recent years (Horticulture New Zealand, 2012), and production in South Island regions has increased at the expense of North Island regions since the arrival of the Tomato Potato Psyllid in 2006, which has inflicted significant economic damage on the industry. Although psyllid levels have not been monitored in Taranaki since production in the region is not significant, high numbers have been recorded in neighbouring regions Waikato and Manawatu-Wanganui (Potatoes New Zealand, 2012).

Process pea production in New Zealand takes place in Canterbury, Marlborough, Manawātū and Hawke's Bay, close to processing infrastructure, which is located in the regions most suited to production of a range of process vegetable crops that are processed at the same plants. Consequently, development of a single processing industry is unlikely take place in isolation.

Most export squash crop is grown on the East Coast of the North Island in Gisborne and Hawkes Bay, and all post-harvest infrastructure is located in East Coast regions. Squash require soils of high natural fertility, which are limited in Taranaki, warm days and cool nights.

Onions can be produced throughout New Zealand but two thirds of production is based in Franklin and the Waikato. The industry does not require heavy investment in processing capacity, and in other regions a number of packhouses are located on farm. However, some scale is required for economic production and on-farm facilities generally service a number of properties. Onions are shipped out of the ports of Auckland, Tauranga and Napier, and cool storage and refrigerated transport are not usually required.

Covered crops and ornamentals:

As Burge et al. (2000) reported, Taranaki has a comparative advantage in the propagation of many nursery species. The region's mild climate, adequate rainfall levels and friable soils that do not require much conditioning mean that the region is well-suited open-ground production of a wide range of trees and shrubs. While the region's relative isolation does add to the costs of freight, growers interviewed felt that freight services were available to meet their requirements and the freight charges did not reduce profitability significantly. The

demise of Duncan and Davies created opportunities for a number of new businesses to become established, using the expertise that had been developed during the company's years of operation. The world market for plants is very large but demand is strongly influenced by global economic conditions; international competition is increasing; and international phytosanitary regulations are becoming increasingly strict (di Feretti, 2013). However, the conclusion that there is potential to increase exports of ornamental plants from Taranaki (Burge et al., 2000) still appears to be true provided growers maintain quality standards and develop sound market relationships.

Taranaki has excellent growing conditions for covered flower crops and access to natural gas, which is a competitively priced energy source. There are several export orchid producers in the region, producing for the large export market.

Orchid production is well established in New Zealand and the industry accounted for three percent of world production in 2011, at which time the international market was worth more than \$1 billion annually. Japan accounted for more than a quarter of world production and the United States for 17 percent (Orchid Society, 2011).

One large orchid grower identified three key issues facing the industry in Taranaki, and in the wider New Zealand industry, which were:

- A lack of expertise in horticultural management in the workforce;
- Lack of coordinated marketing strategy for the New Zealand industry;
- Lack of specialist consultants in New Zealand and a reluctance amongst growers to share information on production technologies.

Although the cost of freight is higher than in some regions he considered this to be of minor importance. Taranaki is well-suited to the expansion of orchid production, although the returns to the New Zealand industry are limited by the factors described.



The growing conditions for covered vegetable crops in the region, including high sunshine hours, are excellent, but production in the region appears to be limited to production for the domestic market. The reasons given for vegetable production in the Taranaki were generally personal, rather than driven by perceived competitive advantage. Although both fresh tomatoes and capsicums are significant export crops in New Zealand, local growers considered that it would be difficult for Taranaki growers to compete with large scale developments in Auckland and Waikato.

4.3.2 INDUSTRIES INITIATED BY SPECIFIC DEMANDS AND NICHE OPPORTUNITIES

During the 1990s and early 2000s considerable research effort was devoted to evaluating new horticultural crops for New Zealand regions and the information compiled is still available to investors considering new crop enterprises. Initiatives included Crops for Southland¹, the Otago Crops Database² and a number of evaluations undertaken by Crop and Food Research (now Plant and Food Research) to examine new crop prospects for New Zealand regions. These included evaluations of the opportunities for Northland (Griffiths et al., 2003) and for the Tararua District (Reid et al., 2006), and for Taranaki (Burge et al., 2000). Many of the crops evaluated during that period are now grown in New Zealand, but few are exported in sufficient quantity to be separately itemised in the export statistics. There has been little new information in the public arena since that time.

Burge et al. (2000) included crops already grown for export in other regions and crops in the early stages of development that could be considered for production in Taranaki. The brief for the current study included a brief re-examination of these crops to determine whether any change in production or market trends could be identified. The crops evaluated were broadly classified as floriculture crops; ornamental plants; medicinal crops (plant, flower and seed and tree crops); vegetable crops; industrial crops; nut crops; truffles and plant extracts. The fruit crops considered have been discussed in Chapter 4.3.1.

While the 14 flower crops evaluated were all suited to Taranaki growing conditions, the majority were not considered to have a competitive advantage over other regions of New Zealand. Two were considered to have some competitive advantage because of the presence of experienced growers in the region (rhododendrons and Disa orchids). No changes in international market conditions for these crops were identified since the original report was completed, and export statistics are available on only five (Statistics New Zealand Infoshare Harmonised trade statistics, 2013). These show that the exports of alstroemeria, gentians, sandersonia and viburnum from New Zealand have declined steadily since 2007 (the first year of record). Only hydrangea exports remained relatively constant over the period before increasing in 2012. It is probable that this reflects the impacts of the global economic crisis on a “luxury” product rather than the long term prospects for these industries, although it is likely that at least some industry participants were forced out as a consequence of low returns during this period.

A diverse range of 10 medicinal crops was evaluated by Burge et al. (2000). These crops are part of the product category “nutraceuticals”, which is of growing importance in world markets. Botanical medicines including ginseng and St John’s wort comprise 64 percent of the top 200 products in the international nutraceuticals market. There is intense competition in the market, and new brands, products and compounds are constantly evolving. For example in the past 15 years three of the crops evaluated in 2000, echinacea, St John’s wort and ginseng (traditional Asian remedies), have been replaced amongst the “hot herbs” by a range of “superfruit” products (Coriolis, 2011).

While thirteen medicinal crops were considered suitable for production in Taranaki, no competitive advantage was identified for the region and at that time there were no known growers. No updated market information on specific products has been located but export statistics show that while exports of ginseng root have

1 <http://www.venturesouthland.co.nz/Economic-Development/Regional-Projects/Agriculture-and-Food/Crops-for-Southland/articleType/CategoryView/categoryId/201/Crop-Data-Sheets>

2 <http://www.orc.govt.nz/Information-and-Services/Farming-and-land-management/Crops-database>

increased dramatically since 2009 and doubled in value between 2011 and 2012 (Statistics New Zealand Infoshare Harmonised trade statistics, 2013), exports of licorice root from New Zealand ceased in 2006. The Burge report observed that although there is a strong international market for ginkgo, industry development would require establishment of processing facilities to convert the leaf into final product. An initiative to establish the industry in Nelson failed when the processing and marketing company went into liquidation in 2012 (Watson, 2012).

Three new vegetable crops were evaluated in 2000; wasabi; ulluco (South American tuber crop) and oca (New Zealand yam). There was insufficient information on which to evaluate the potential for Ulluco development in Taranaki although commercial development in New Zealand was considered likely. The only New Zealand production to date appears to be domestic production by a heritage produce company. Wasabi is in high demand in international markets and it was considered that with shelter, good pest and disease management strategies and access to a rapid freight system wasabi could be grown well in Taranaki, although other regions have greater comparative advantage. No evidence of a Taranaki industry has been found, but a small export industry has been established in New Zealand. The domestic market for oca was considered to be well supplied by existing producers so successful expansion of the industry into Taranaki would be dependent on the development of export sales, which has not occurred to date.

Two industrial crops were evaluated. These were yacon, a tuber crop from which carbohydrates which have antibacterial properties can be extracted, and konjac which has a number of uses including thickening and gelling; food and medicinal uses in Japan; and may have applications as a fat substitute in low fat food products. In 2000 it had been established that these crops could be grown in New Zealand, and Taranaki growing conditions were believed to be well suited to their production. However, the economics of production had not been evaluated and no industry development occurred. This situation is unchanged.

The two herbal teas evaluated included mate leaf tea and boldo tea, both made from the leaves of South American

shrubs, which have been traditionally consumed in South America and have gained wider acceptance in global markets. A more recent assessment of the potential for mate production in New Zealand (Halloy and Reid, 2003) concluded that there is good potential for a mate industry in New Zealand for the domestic market and eventually for export. While no trials had been undertaken in the North Island at that stage, Taranaki was identified as a potential growing region. To date there have been no reports of production in New Zealand. Boldo leaf was described by Burge et al. (2000) as “a tree which may have a place in the Taranaki hill country but it is unclear how well it would perform...”. Further evaluation is necessary before conclusions about its suitability for regional conditions can be drawn.

The only nut crop evaluated by Burge et al. (2000) was the gevuina, a relative of the macadamia nut, which at that time was new to western markets. However, “new” nut crops were the fastest growing segment in the large and very rapidly growing international nut market. It was not clear how the crop would perform in Taranaki although it may be suited to upland areas of the region. There is no evidence of industry development in New Zealand. The macadamia nut grows well in Taranaki and small volumes are produced. However, the returns from commodity nut production are low, and the costs of freight to Auckland for processing further reduce margins. A local grower has established a processing plant to process both nuts produced on the orchard and imported nuts into a range of high value-added products to be sold to the hospitality industry and through internet sales.

The development of a plant extracts industry in Taranaki would require a “strong commitment to development that integrates the whole supply chain from growers to the market place” (Burge et al, 2000). Close coordination between the grower and the processing plant is required, so for an industry based on plant extracts to succeed, establishment of both production and processing capacity must be economically feasible. While the authors discussed a number of plant extracts that had both market potential and cultural requirements that matched conditions in significant areas of Taranaki, they noted the need for detailed assessment on case-by-case basis. This has not yet been undertaken.



On the basis of this evaluation Burge et al. (2000) identified 10 crops that had the greatest potential for development in Taranaki, but there are no reports of such evaluation or evidence that any of these opportunities have been taken up by local growers. These industries included gentians, hellebores, rhododendrons; wasabi; Manuka oil; mate and boldo teas; valerian, licorice and gevuina.

It is clear that a wide range of niche crops can be grown in Taranaki, but there do not appear to have been any attempt to develop these in the region on an individual or an industry basis. Future development, if it occurs, will be driven by the passion of one or a number of enthusiasts with the resources to evaluate and establish the industry and the regional infrastructure required to support it.

4.3.3 INDUSTRIES BASED ON PRODUCTS FOR WELL-ESTABLISHED INTERNATIONAL MARKETS THAT ARE NOT CURRENTLY GROWN IN SCALE IN NEW ZEALAND

Two industries that appear to offer significant industry development and diversification opportunities in Taranaki recently are high-activity Manuka honey, for the international wound-care industry, and industrial hemp, from which a diverse range of products is manufactured internationally. Neither can properly be classified as horticultural crops but they have been included in this study since its production represents a novel landuse in Taranaki that may provide opportunities for diversification of the region's land-based industries.

Manuka honey:

While Manuka honey is already exported from New Zealand, the present scale of the industry is small in relation to international market demand. Manuka honey, which is unique to New Zealand, is in high demand in the global wound-care market because of its high levels of antibacterial activity. Like other honeys, Manuka honey has antibacterial properties derived from the creation of hydrogen peroxide by the enzyme glucose

oxidase. However, the main source of the high levels of antibacterial activity associated with New Zealand Manuka honey has been shown to be Methylglyoxal (Mavric et al., (2008). Methylglyoxal remains active after sterilisation using irradiation, which is required if the honey is to be used as a wound dressing. This non-peroxide antibacterial activity is not present in all Manuka honeys, and a UMF[®] (unique Manuka factor) rating system has been developed to compare the levels of non-peroxide antibacterial activity of honey samples with the antibacterial level of the disinfectant phenol. Manuka honey with UMF15 has a level of antibacterial activity equal or greater than a 15 percent solution of phenol in water (UMF, n.d.). A UMF[®] rating of 15 or higher indicates that the product has very high levels of antibacterial activity, and is suitable for therapeutic purposes.

A recent report on the export value of New Zealand food and beverage sector concluded that Manuka honey is driving export growth in the honey industry, which was identified as an export industry with major growth potential (Coriolis, 2012). The strengths of the Manuka honey industry include the fact that it is a unique, defensible product; has a strong position in several markets; and can leverage off the favourable opinion of New Zealand products in key markets. Although international and domestic market demand for Manuka honey and the products derived from it continues to grow, industry growth is limited by lack of supply. Supply is constrained because there is insufficient economically accessible high-activity Manuka, and because honey yield and quality between regions, blocks and seasons is unpredictable (PGP, 2011).

In order to facilitate industry expansion that would enable the industry to reach an a value target of \$1 billion, the Primary Growth Partnership (PGP) has awarded funding of \$1.7 million over seven years to a Manuka honey industry consortium with the objective of improving the reliability of supply and yields of medical grade Manuka honey. A science-base will be developed for the industry to enable it to understand the impacts of local ecosystems on Manuka honey yields and activity levels. The group is led by Manuka Research Partnership (NZ) Limited and Comvita Limited.

Neil Walker (Managing Director, Manuka Research Partnership (NZ) Limited), is a Taranaki Regional Councillor who views the industry as an opportunity to reverse the decline of large areas of Taranaki back country (Neil Walker, pers. comm.). It is estimated that the \$1 billion target could be achieved if 50,000 hectares of marginal land were used for Manuka honey production (PGP, 2011). Under the PGP new high-activity cultivars of Manuka are being developed, which not only lead to increased honey yield but also extend the season for honey production.

It is economically feasible to harvest Manuka from relatively small (100 hectares) areas of back country land, including Class 7 land which has little production potential under pastoral production systems and is generally regarded as suitable for protection and forestry landuses only.

Neil Walker estimates that the value of Manuka honey per hectare (at 2-3 hives per hectare) is \$1,200, at a market price for Manuka honey of \$12 per kilogram. One beekeeper can run five hundred hives that will generate a gross income of \$240,000, and Neil Walker has proposed a cooperative model that involves groups of ten farmers, each with 50 hives, which employ a beekeeper to manage the hives. There are also opportunities for farmers to generate an additional source of income from carbon blocks. To date, the Manuka Research Partnership has developed 100 hectares of Manuka which has activity levels of two to three times those of naturally occurring cultivars, and is actively encouraging farmers to plant Manuka.

Coriolis (2012) concluded from an industry analysis that “New Zealand Manuka honey is an attractive, high growth industry with solid fundamentals”. For Taranaki landowners, the industry offers an opportunity for diversification into a high value landuse on land for which opportunities are very limited. Even relatively large-scale expansion will have little displacement effect on other

farm enterprises. Alternatively, industry development provides opportunities for back country farmers to inject capital into their farming enterprises by subdividing and selling comparatively small areas of land, which is of low productive value otherwise, to Manuka honey producers.

Industrial hemp:

Industrial hemp is grown for a number of end uses and it is estimated that more than 25,000 hemp-based products are sold in the global market. Its fibre is used in the manufacture of fabrics and textiles; yarns and raw or processed spun fibres; paper; and carpeting, construction and insulation materials. The interior stalk or hurd is used primarily for animal bedding, and hemp seed and oilcake are used as a food protein source for both humans and livestock. Hemp seed oil is used in cosmetics, and in nutraceuticals and pharmaceutical products (Johnson, 2013). Hemp has been used for fibre, oil, food and medicine for many centuries.

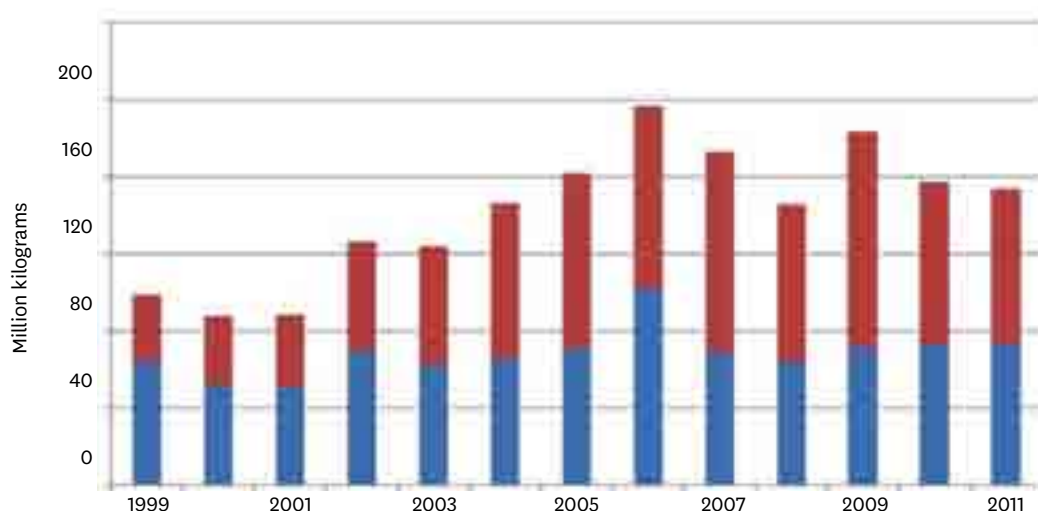
Approximately 30 countries world-wide, now permit the cultivation of industrial although production is still banned in the United States. China is among the largest producing and exporting regions and production occurs in most of the EU member states. Although the area in industrial hemp has been comparatively stable in recent years at approximately 80,000 hectares, production has increased significantly since 1999, which is mainly attributable to the increase in hemp seed production as Figure 8 shows (Johnson, 2013).

A recent initiative to establish an industrial hemp industry in Taranaki has been met with considerable public interest at a seminar held to promote the product. The production of industrial hemp in the region has been initiated by Greg Flavell, the co-founder of Hemp Technologies (USA) Inc. in North Carolina, which was established to build healthy, energy- saving homes using a hemp and lime based product.

As a building, material hemp is hypo-allergenic and it has the highest insulating and noise-reducing properties of any cellulosic product.



FIGURE 8: GLOBAL PRODUCTION OF HEMP FIBRE AND SEED 1999-2011



SOURCE: FAOSTAT, [HTTP://FAOSTAT.FAO.ORG/SITE/567/DEFAULT.ASPX#ANCOR](http://faostat.fao.org/site/567/default.aspx#ancor)

Originally from Taranaki, Greg returned to New Zealand to develop hemp-cropping for export to the United States, but now intends to remain in Taranaki and help develop a local hemp production industry and encourage the production of hemp houses in this country. His aim is to see 1,200 hectares of industrial hemp planted and processed in Taranaki (Greg Flavell, pers. comm.).

The first crops were harvested in the region early in 2012, and it is expected that approximately 40 hectares will be planted this season. Two Taranaki farms are now licensed to produce industrial hemp and another nine have applied to be licensed for next season. The first processing facility is to be established in the region in 2013, and will be able to handle the production from 250 hectares of industrial hemp, which will be grown on contract by local growers. Initially only straw for the manufacturing of building material will be processed, but it intended that a seed pressing facility will also be built on the site.

The growing conditions in Taranaki are excellent for hemp, which is generally grown as a rotational crop with soil-depleting crops, and could be grown in rotation with maize for dairy support in Taranaki. On a per hectare basis the returns from industrial hemp are approximately twice those of maize grain (more than \$6,000 per hectare).

If successful, the industrial hemp industry in Taranaki will provide a high-returning sustainable diversification option for Taranaki growers, as well as green employment in the processing sector.

4.4 OPPORTUNITIES FOR PARTNERSHIPS IN RESEARCH AND EDUCATION TO FURTHER HORTICULTURAL INDUSTRY DEVELOPMENT IN TARANAKI.

Although Massey University and Venture Taranaki have entered a partnership with the object of expanding longstanding research, teaching and alumni connections between Massey and the Taranaki region's business sector and wider communities, no opportunities have been identified with respect to horticultural development (Nick Roskruge, Senior Lecturer in horticultural management, Massey University, pers. comm.). The University has been involved in research projects in the area in the past and will be in future if opportunities arise. Although Massey has a number of horticultural management students from Taranaki, they seldom return to the region after graduation.

Lincoln University in Canterbury is a specialist land-based university, which has adopted a broader 'Lincoln University Plus' model, which recognises the importance of existing and developing relationships and the critical contribution that these relationships make to land-based education and research (Tony Moffat, Business Development Manager, Lincoln University). As part of the broader model the University is developing educational partnerships with a range of other providers that will facilitate the delivery of Lincoln courses in the region. For example a partnership with the Nelson Marlborough Institute of Technology (NMIT) allows the University to deliver its Bachelor in Oenology at the Marlborough Campus. This offers students a pathway from NMIT's two-year Diploma in Viticulture to a Lincoln degree in oenology that enables them to complete their studies without leaving the region.

As science providers both Plant and Food Research and Lincoln University are likely to develop relationships in the Taranaki region on with respect to specific projects related to the interests of regional clients.

4.5 OPPORTUNITIES FOR DIVERSIFICATION ON MĀORI LAND

Parinihi ki Waitotara (PWE) is a Māori incorporation that administers, on behalf of approximately 8,500 shareholders, the leases on approximately 18,000 hectares of land in Taranaki, which are leased in perpetuity under the Māori Reserved Lands Act 1955. The Māori Reserved Land Amendment Act 1997 retained the rights of lessees to renew leases in perpetuity, but conferred the first right of refusal on leases offered for sale on the lessor (with some exceptions in the case of family sales). Since that time PKW has exercised the right to purchase the leases on approximately 2,000 hectares of land and has a policy of purchasing leases as they become available (Dion Tuuta, CEO, PKW, pers. comm.).

Since 1997, development on recovered leasehold land has been predicated on a land development plan based entirely on dairy production, and almost all of the leasehold land that has been recovered to date (approximately 2,000 hectares) is used for this purpose. PKW is the largest Fonterra supplier in Taranaki and the 13th largest nationally, and owns 13 dairy farms and two dairy support properties in Taranaki. The farms are operated under varying contractual arrangements but the majority of these are 50:50 sharemilking arrangements.

PKW's land management objectives include not only those related to financial performance but also the provision of opportunities for the descendants of the land to become involved in its operation and developing the next generation of Taranaki Māori dairy farmers and land managers.

Although Taranaki Māori are landowners there is not a high level of engagement in its management. The leasehold system means that young Māori do not grow up on farms and lack of understanding and knowledge are a major barrier to attracting young people to a career in land-based industries. At present only five of the PKW dairy properties are managed by Taranaki Māori.

Some of blocks of land on which PKW holds the first right of refusal are too small to be of value to dairying and alternative uses for these are likely to be sought in future. Horticulture might also be considered as a diversification option on larger areas in the future. A key constraint on horticulture development by PKW is lack of understanding of, or expertise in, horticulture.



Discussion and Conclusions

5.1 TARANAKI HORTICULTURE: PRESENT AND FUTURE

It is widely recognised that “anything will grow in Taranaki”. The region has large areas of land well-suited to horticultural production, a temperate climate without extremes of temperature, and good rainfall.

However, despite a number of attempts to facilitate development during the last 30 years, the region’s horticultural industry remains very small, and the area devoted to horticultural production has been in decline for some years. Although it is possible to grow a diverse range of horticultural crops in the region, there are few examples of crops in which Taranaki has a competitive advantage over other regions.

Taranaki has the fastest growing regional economy in New Zealand. The region is ranked third in terms of average household income and the unemployment rate is one of the lowest in New Zealand. Employment has grown strongly during the last decade (MBIE, 2013). The regional economy has been fuelled by high international prices for the outputs of its two largest industries; the oil and gas industry and the dairy industry. While the oil and gas industry is the largest contributor to regional GDP, jointly the dairy farming and dairy processing industries contribute most to regional employment.

Dairying dominates the Taranaki farming sector, and is the yardstick against which alternative landuses are measured. The majority of interviewees considered that the future of dairying is assured; that the industry has the support of the wider community; and that the adverse environmental impacts of dairying in Taranaki are fewer than in many other regions. A sophisticated infrastructure has been developed in the region to support the industry, including processing capacity transport facilities, consultancy services and educational opportunities. However, as the high level of international concern about recent reports of possible contamination of whey protein produced by Fonterra demonstrates, heavy reliance on a single industry is not without risk. Few Taranaki dairy farms appear to have diversified into other enterprises either as a mean of spreading risk, or to provide an

avenue to farm succession, which has been identified as an important issue to be addressed by many of the region’s dairy farmers (Tarbotton and Bell, 2012).

The success of the dairy industry in Taranaki appears to have suppressed interest in other landuses to a large extent, and there has been an erosion of regional interest in horticulture since the failure of the local kiwifruit industry and Cyclone Bola in the late 1980s. Even the Taranaki Regional Policy Statement (TRC, 2009b) devotes only a short paragraph to horticulture, the content of which requires updating, since it suggests that asparagus is one of the two main horticultural crops grown, although that has not been the case for some time.

Haylock reported that in 1998 a self-reinforcing cycle of horticultural underachievement existed in Taranaki. This also appears to be true today. The majority of those interviewed were not optimistic about the future of horticultural industries in Taranaki, and numerous examples of fruit and vegetable businesses that have closed, or are expected to close, were cited. Haylock also reported that, with isolated exceptions, there was little development of more sophisticated business systems in the region’s horticultural enterprises, which is also true today. There is little coordination amongst horticultural producers in the region, and there appear to be few opportunities for sharing information and fostering industry development. Neither the regional Fruitgrowers Association nor the Vegetable Growers Association is active.

Although individuals have been motivated to develop their own horticultural enterprises, until recently there have been no attempts at the development of new industries in the region for a number of years. Many of the existing enterprises, and those that have ceased operation during recent years, have been developed to achieve interwoven lifestyle and business aspirations.

A comprehensive review of opportunities for horticultural development in the region has found that there is little likelihood of any significant expansion of New Zealand's major fruit and vegetable export industries in Taranaki. The performance of smaller export industries in the region is unlikely to encourage their development, and although previous studies, in particular a new crops assessment undertaken by Burge et al. (2000), have identified some opportunities for new crops, these have not been taken up.

With the exception of ornamental plants and flowers, horticultural production for export in Taranaki is almost non-existent.

It is probable that the Taranaki fruit and vegetable industries will continue to be based on production for the Taranaki and domestic (mostly lower North Island) markets, undertaken by committed individuals following their own interests.

The study identified a number of constraints to horticultural development in Taranaki, most of which had had also been reported by Haylock, 1998. Regional and district plans impose few constraints on horticultural development, and the main constraints relate to the lack of the infrastructure required by horticultural businesses, including transport infrastructure (which has already been recognised as a limitation to economic development (Venture Taranaki, 2012)), packing and processing capacity, consultancy services, etc.. Science providers to the horticultural industries do not have a regional presence, and the opportunities for horticultural education in the region are extremely limited. While horticultural consultants based in other regions have been engaged by Taranaki growers on occasion, there do not appear to be any regionally-based consultants.

A number of the growers interviewed reported that the banking industry in Taranaki does not support horticulture, and that rural bankers in the region have little understanding of horticultural enterprises. Others reported that they had received considerable support

from financiers. The banking representatives interviewed reported that they rarely received finance proposals from horticultural producers, but those that are received are evaluated on the same basis as other commercial propositions.

The final constraint discussed both by growers and a number of other interviewees was the high price of land suitable for horticultural development in Taranaki. Horticulture must compete with dairying and rural small-holdings for land in the region, and most of the land suitable for horticultural development is already used for these purposes. Dairying is widely regarded as the "highest and best use" for land in the region. The average size of dairy farms in Taranaki is significantly lower than the national average, but has been increasing during the last decade as amalgamation has occurred, and dairy farmers in the region are reported to be "aggressive" participants in the rural real estate market. In fact, the prices for high-quality horticultural land are high throughout much of New Zealand, but in Taranaki the perceived risks of horticultural production are higher than elsewhere. Low prices for horticultural land in Taranaki might be considered to confer a comparative advantage that would encourage horticultural development. However, at existing land prices, potential developers are more likely to consider regions in which horticulture is supported by existing infrastructure, unless they have personal reasons for living and working in Taranaki.

The main opportunities for new land-based industry development in Taranaki, Manuka honey and industrial hemp, are industries based on novel landuses, rather than horticultural industries. The reasons why industries based on these crops are likely to be successful in Taranaki include:

- **Comparative and competitive advantage and innovation:** New Zealand has a clear comparative advantage in the production of Manuka honey since it is produced from species unique to New Zealand. The processing company involved in the Manuka honey PGP (Comvita Ltd) has a record of innovation and considerable research funding has been committed to developing a science base for the industry.



The regional growing environment is well-suited to the production of industrial hemp, and development of the industry is being driven by an entrepreneur who has developed innovative applications of industrial hemp in the building industry in the United States.

- **Trends in international markets:** There is strong demand for high-activity Manuka honey in the large international wound-care market, in which supply is exceeded by demand, and the industry has been identified as having very high potential for export growth by the New Zealand Food and Beverage Sector Project (Coriolus, 2012). Key international market trends of relevance to the industry are the increasing emphasis on health and wellbeing; natural products; and environmental sustainability.

The international market for a diverse range of hemp-based products is large and well-established. In New Zealand there is increasing demand for eco-friendly housing and the increasing incidence and awareness of environmental allergies is likely to increase the demand for hypo-allergenic building materials. Industrial hemp is produced by an environmentally sustainable production system.

- **Complementarity with other enterprises:** The production of both Manuka honey and industrial hemp complements enterprises that are well established in the region. Manuka honey production can be based on areas of land of low productive value to other enterprises, offering opportunities for diversification, or for the subdivision and sale of this land to inject capital to existing enterprises. Industrial hemp can be grown as a restorative rotational crop with maize, which is grown in the region to support the dairy industry.
- **The policy environment:** Regional and district policy in Taranaki do not appear likely to constrain development of the Manuka honey and industrial hemp industries.
- **Industry structure and leadership:** Both of these industries are led by industry champions with a passion for the industry and a commitment to regional economic development. The Manuka honey

PGP provides a platform for industry development in Taranaki and has plans to involve local farmers to achieve the industry target of 50,000 hectares of high-activity Manuka on which to install hives and harvest honey. A research and development programme has been established, and is funded under the PGP.

Hemp Technologies NZ Ltd has a target of 1,200 hectares of hemp production in the Taranaki region. The company is selling hemp seed to licensed growers and providing consultancy services to end-users wishing to build hemp houses.

Market development and promotion: The Manuka honey industry is already producing and exporting a unique New Zealand product into a lucrative world market in which it has brand recognition. The PGP between the Manuka Research Partnership and an established processor/marketer, established to encourage production to meet export growth objectives, provides a strong platform for development of export strategies to meet existing market demand.

The industrial hemp industry is in its infant stages, and although there are plans to build processing capacity ahead of productive capacity, the industry is still strongly production-focussed. It is yet to develop both research and development, and domestic and export market development strategies. A small company is driving industry development, and lacks the resources to advance on all fronts simultaneously (Greg Flavell, pers. comm.).

Horticultural production is unlikely to play an increasingly important role in the regional economic development of Taranaki, although some horticultural businesses will continue to thrive. The region has a comparative advantage in the production of ornamental plants and covered flower crops, and expansion in the sector is possible. A number of individual businesses can be expected to continue producing for the local and domestic markets, and small pockets of export production may continue to exist. New developments in fruit and vegetable production are more likely to reflect the interests of dedicated individuals than a drive to extend established horticultural industries into Taranaki in the foreseeable future.

However, novel crops such as Manuka honey, industrial hemp, and others yet to be identified, may well provide new opportunities for diversification and economic growth in the Taranaki land-based sector.

5.2 THE POTENTIAL ROLE OF VENTURE TARANAKI IN FACILITATING REGIONAL HORTICULTURAL DEVELOPMENT

Horticultural development is unlikely to become an avenue to increased regional economic development in the foreseeable future in Taranaki, since the region has little comparative/competitive advantage in horticulture and very little infra-structural support for the industry. Novel crops, however, may provide opportunities for diversification in the land-based sector.

Haylock (1998) suggested three levels of activity at which Venture Taranaki could become involved with the facilitation of horticultural development in the region, which have been revisited in the context of the existing study. They were:

1. Incorporating horticulture in Venture Taranaki's existing activities;
2. Developing a modest range of new activities;
3. Developing a comprehensive range of new activities.

During the period between the Haylock research and the current study it has become clear that intervention at Level 3 has not been a successful strategy for regional economic development in New Zealand. In the past a number of regional development agencies, including Venture Taranaki, have funded the screening of new crops to identify those most likely to contribute to regional economic development and primary sector diversification. In the main, however, this work does not appear to have resulted in an increase in niche market horticultural development in these regions. In a region such as Taranaki, where there is no clearly identified comparative advantage in horticultural production, with the exception of the production of ornamentals and covered flower crops, an assistance strategy based on "picking winners" is unlikely to be of value.

Similarly, a number of the Level 1 and 2 activities aimed at promoting horticultural development in a generic manner do not appear to be justified, given the trends in Taranaki horticulture. These include adopting a horticultural focus when developing business development programmes and organising seminars on horticultural opportunities. However, a number of the Level 1 and 2 activities suggested by Haylock (1998) are included in the following list of actions that might be considered by Venture Taranaki in order to assist the development of horticulture and novel land-based industries in Taranaki.

The Level 1 activities described by Haylock included encouraging horticultural businesses to access the support and funding offered under government programmes to facilitate business growth. Support is offered under:

- **Programmes administered by Callaghan Innovation:** In early 2013 Callaghan Innovation, a stand-alone Crown entity, was established to manage government funding and grants to support business innovation and capability building. Previously, much of that funding had been administered by Trade and Enterprise New Zealand. Funds are available for research and development and assistance for business in accessing information, funding, training and development services.
- **Sustainable Farming Fund:** An important source of funding for land-based industry research and extension projects is the Sustainable Farming Fund (SFF), administered by the Ministry for Primary Industries. The SFF funds "Communities of Interest" to undertake applied research and extension projects that tackle a shared problem or develop a new opportunity. The projects are led by growers with the support of other stakeholders including industry organisations, researchers or consultants. SFF funding is often used to leverage a high proportion of other funding or in-kind support or the project. In 2012, MPI announced that the SFF would provide separate funding for projects that encourage sustainable resource use by Maori agribusinesses, and that it would MPI undertake activities that specifically foster opportunities for Maori agribusiness.



In order to assist existing producers and new industry entrants, Venture Taranaki could play a valuable role in ensuring that horticultural and novel crop producers in Taranaki are aware of the support that is available, and that Venture Taranaki can assist them in securing this. Strategies to achieve this could include:

- **Prepare case studies** of local horticultural businesses that have secured and used funds, mentoring services, etc under the programmes and publicise these in grower magazines, local farming press and other widely read regional information sources;
- **Compile an up-to date and easily-accessible list of the funds and services available to land-based industry participants:** Ensure that horticultural and new crops producers are aware that these services apply to their businesses, and the manner in which they can assist business development. At the same time encourage growers to approach Venture Taranaki for assistance in accessing support;
- **Target businesses to be approached directly to offer this support.** These may include existing growers in the sectors identified as most sustainable, but perhaps more importantly, the industry champions in emerging industries in the region. The Manuka honey industry has already secured considerable funding for industry development under its PGP bid, but may require funding to assist with activities outside the scope of the PGP. Greg Flavell (Hemp Technologies NZ Ltd) observed that, although research would be of value to the industry, the development of production and processing technology is absorbing all his energy at present.

Assistance in the infant stage of the industrial hemp industry, and other promising industries that emerge in future, is likely to be of considerable value. As Taranaki is a small region, and new industry initiatives (as opposed to individual business developments) are likely to be

widely publicised, identifying new industries championed in the region is unlikely to be difficult.

Haylock (1998) also considered that Venture Taranaki could facilitate horticultural development by lobbying for infrastructural improvements that affect horticulture. The regional economic development strategy developed by Venture Taranaki identified the need for improvements in several aspects of regional infrastructure, which will benefit horticulture as well as other regional industries. With respect to horticultural infrastructure, the specific nature of infrastructural requirements will depend on the nature of any developments undertaken. Potential roles for Venture Taranaki include:

- **Liaise with new industry representatives** in order to understand their requirements with respect to infrastructure and the extent to which these can be addressed at the regional level;
- **Act as a facilitator for a group approach to the transport industry if demand is established:** When the growers who were interviewed for the study were asked which of the business constraints they reported could be addressed at the regional level, there was little consistency in their answers. However, one of issues most frequently raised was the need for improved transport services, which better meet the specific requirements of horticultural producers. Allan Court (Express Couriers) considered that if groups of growers with similar requirements were to approach his company it may be possible to provide options that suited their requirements better. However, it is likely that there will be insufficient volumes of product with similar transport requirements to justify customised services.

Cluster formation has been important in the development of horticultural industries in other regions, but clusters of producers with similar interests do not appear to exist in Taranaki, although there are informal linkages between some industry participants. Since the regional Fruitgrowers Association and the Vegetable Growers Association are no longer active in Taranaki, attempts to encourage growers to join national associations are

unlikely to be of value. It is also unlikely that creating opportunities for existing growers with similar interests, or growers of differing products, to meet and discuss issues of common interest will be successful. A recent attempt to engage the region's avocado growers (of whom there are up to twenty, mostly very small growers) in a collaborative venture to fund visits by an experienced Bay of Plenty consultant to examine and advise on production issues failed because of lack of interest. Few other industries have more than a very small number of participants.

Venture Taranaki may, however, play a valuable role in:

- **Establishing grower forums or clusters in novel industries:** The establishment of industries based on new crops requires those championing the industry to actively seek potential growers and provide them with information on production technologies, market prospects, contractual arrangements, etc. The success of New Zealand industries producing for large international markets is enhanced by the existence of a collaborative, rather than a competitive, production base (Greer, et al., 2000). Development of the collaborative base is facilitated by the early development of strong linkages among industry participants. Venture Taranaki could assist these industries in setting up clusters of growers.

The CEO of Parininihi ki Waitotara, Dion Tuuta, indicated that PKW may be interested in opportunities for horticultural development on smaller blocks of previously-leased land in future; opportunities that encourage young Maori to gain the skills required to manage the Maori land resource; and opportunities to diversify production. It is recommended that Venture Taranaki:

- **Liaise with PKW** to investigate the opportunities to provide assistance in furthering PKW's involvement with landuses other than dairying. The assistance may involve securing research and development funding or other publicly-funded services, and facilitating partnerships between Massey University and emerging industries in the region.

Although some grower interviewees identified two other constraints to horticultural development that they believe could be addressed at the regional level, the value of intervention in these areas may be limited.

- **Facilitating access to information:** One interviewee discussed the difficulty of obtaining information on issues such as the licensing of intellectual property, and the availability of specialist engineering services. There may be justification for investigating the level of demand for an easily accessible directory of business services related to all aspects of horticultural business in the region, although the current study did not identify a widespread need for this;
- **Develop a greater understanding of horticulture amongst Taranaki financiers:** Several of the growers interviewed considered that Venture Taranaki could facilitate an opportunity for bankers to learn more about horticulture. However, the bankers interviewed reported that horticultural proposals are evaluated on the same basis as other commercial proposals, including proposals for dairy developments. However, the additional risks associated with development of enterprises in which Taranaki does not have a record of success, will undoubtedly be considered. Further discussion with the banking industry to determine the level of interest in a horticultural workshop would be required.

The most obvious role for Venture Taranaki in supporting the diversification of land-based production in the Taranaki region is in supporting emerging industries by:

- Liaising with emerging industry leaders to identify their present and future infrastructural requirements, and supporting infrastructural development where possible;
- Ensuring that emerging industries in the region understand and have access to all the publicly funded support for industry development that is available, and the assistance required to secure this.



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Appendix 1

MINOR CROPS GROWN IN TARANAKI

Fruit crops	Indoor vegetables
Table grapes	Capsicum
Apples	Cooking herbs
Nashi (Asian) pears	Lettuce/salad greens
Peaches	Tomatoes (Indoor)
Blueberries	Outdoor vegetables
Boysenberries	Asparagus
Raspberries	Broccoli
Strawberries	Cabbage
Oranges	Carrots
Grapefruit/goldfruit	Cauliflower
Lemons	Cooking herbs
Mandarins	Green beans
Tangelos	Kumara
Olives	Lettuce
Chestnuts	Onions
Hazelnuts	Squash
Macadamia	Sweet corn
Walnuts	Tomatoes (outdoor)
Other fruits	

About Venture Taranaki

Venture Taranaki Trust is the region's development agency. We help grow the region.

Incorporated as a charitable trust, Venture Taranaki is a dynamic organisation which has facilitated business success from enterprise inception through to sustainable growth based on international competitiveness.

Venture Taranaki is an initiative founded by the New Plymouth District Council. In addition to the New Plymouth District Council, Venture Taranaki is supported by: South Taranaki District Council, Stratford District Council, Taranaki Electricity Trust, Ministry of Business Innovation and Enterprise, Business in the Community and numerous other organisations.



ABOUT THE AGRIBUSINESS AND ECONOMICS RESEARCH UNIT (AERU)

Venture Taranaki commissioned AERU to independently undertake an investigation into the potential development of horticulture in Taranaki.

The Agribusiness and Economics Research Unit (AERU) operates from Lincoln University providing research expertise for a wide range of organisations. AERU research focuses on agribusiness, resource, environment, and social issues.

Founded as the Agricultural Economics Research Unit in 1962 the AERU has evolved to become an independent, major source of business and economic research expertise.

The Agribusiness and Economics Research Unit (AERU) has four main areas of focus. These areas are trade and environment; economic development; non-market valuation, and social research.

Research clients include Government Departments, both within New Zealand and from other countries, international agencies, New Zealand companies and organisations, individuals and farmers.

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