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Establishing and operating a Sweet Cherry orchard in Central Otago:

A business Plan

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Executive Summary

This business plan, to establish and operate a cherry orchard in Central Otago, intends to achieve the following objectives:

- Understand the costs of establishing and operating a cherry orchard.
- Gain an overview of the challenges and risks within the sector.
- Understand the market dynamics for NZ produced cherries and what the future market trends might be.

To be fully informed, and in order to make reasonable judgements, the report was compiled using the following methods:

- Personal interviews with current orchardists to understand current practices, risks that affect production and developments in growing systems.
- Speaking with horticulture consultants to appreciate the current trends in orchard systems and the more successful approaches to growing.
- Technical literature review of new planting systems and the development of automation and technology in orchards.
- Direct discussion with product suppliers and manufacturers, agronomists, orchardists and accountants to compile accurate development and operational budgets.
- Interviews of industry leaders who have a good overview of market dynamics and industry challenges

The conclusions drawn from this report include;

- A continual strong demand from export markets for premium NZ cherries that current supply cannot completely satisfy. A trend which is expected to continue.
- Chile is a key competitor to NZ grown cherries producing high volumes and exporting at a similar time of year. This highlights the necessity for NZ to continue to focus on premium quality fruit and high value markets.
- There is a greater need of collaboration and market co-ordination for NZ producers.
- Capital cost of establishing a cherry orchard is high.
- Growing risks are high though many can be reduced.
- New planting systems offer increased yields and reduced operating costs though have approximately 20% higher capital costs.

The report is intended to help any people thinking about entering this sector and establishing an orchard.

Acknowledgements

I would like to acknowledge all of the people who helped with this project. It was gratifying to have so many people contribute their time to discussing and sharing their experiences, ideas and thoughts. The passion and enthusiasm for the cherry industry was infectious as was the openness about the challenges and risks associated with the sector.

A massive thank you to my family for putting up with a sometimes absent and often distracted husband and father. And thank you for joining me on some of the long road trips down to Central Otago. Though this might be the real beginning our own cherry journey.

For planting the initial seed of an idea, some years ago, Jenny and Chas Roberts. For sharing their passion and knowledge of the industry, Tim Jones, Earnscy Weaver and Alex Huffadine. To Alistair King for his pragmatic realism and advice.

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Introduction

The New Zealand (NZ) cherry industry is currently undergoing significant expansion with production more than doubling since 2013 (Coriolis, 2018) and according to leaders within the industry, planned and committed plantings could double the area in cherry production over the next five years from approximately 850 hectares (ha) to 1500 ha. Once these proposed plantings come into full production and allowing for improved planting systems then it's feasible that NZ cherry production will double within the next decade to more than 12,000 tonnes.

The main reasons for this growth are three consecutive successful growing seasons (2014, 2015 & 2016) where quality, yields and returns were exceptional. New growing systems that offer higher yields, allow for easier management and possibly reduced operational costs and, most importantly, growing demand in international markets, China in particular.
The main markets that NZ growers target is the pre-Christmas NZ market, running two weeks before and over the festive period when local prices are similar to export prices without the same costs of getting to market. The other key market and now the primary market, is export into Asian countries targeting the Chinese New Year and Lunar New Year celebrations where the colour red and the tradition of gifting means that cherries fit well into these festivities. Around 75% (SummerfruitNZ, 2017/2018) of NZ's annual production is exported.

The collective summer fruit industry, combining apricots, peaches, nectarines, cherries and plums, and represented by the levy body, Summerfruit NZ, is well aware of the growth phase the industry is going through and is preparing a strategic plan with Primary Growth Partnership (PGP) funding. This will assist the industry in being fit for growth and will provide a programme of initiatives and support that will assist NZ growers and exporters to continue to be competitive in all relevant markets.

In a number of other primary industries NZ is a significant world exporter, however when it comes to cherries NZ produces less than 0.5% of total world cherry production (Coriolis, 2018) and around 3% of the southern hemispheres production. Though while only producing 0.5% of world production, we are able to achieve 2.5% of the world's export value (FAO, 2016). Unlike NZ dairy exporters, we cannot influence the world market through volume or price so the focus has been, and should continue to be, on high quality fresh cherries, speed into market and taking advantage of any added value opportunities. With increased scale, it is possible that the NZ industry can start to investigate alternative uses of cherries to take advantage of the well-known health properties that cherries have such as melatonin and antioxidants. These properties decrease stress and inflammation (Darshan S. Kelley, 2018) and

possible further processing for extraction and development into health and nutritional products could be a development for the NZ industry.

As NZ is undergoing a reassessment of land use, especially in sensitive geographic catchments, a general increase in economically viable alternative land uses is a positive development in NZ and cherries, amongst other horticulture options are a great opportunity for NZ's primary industries.

Aims and Objectives

The purpose and intention of this report is to enable the reader to;

- Gain an appreciation of the costs involved in establishing a sweet cherry (from this point on, referred to cherry or cherries for simplicity) orchard in Central Otago, NZ.
- Operating costs in full production over a 10 year period from planting arecompiled.
- An understanding of the key challenges and risks in the industry
- An overview of the structure and current trends in themarket
- Market forces involved in the domestic NZ market and the international export market

At the conclusion of the report, the reader will be in a position to make a judgement about further investigation of investment opportunities in this growing sector.

Methodology

There is limited published information on the NZ cherry industry with almost all technical information coming from overseas. In May 2018, Coriolis published an overview of the export market opportunities for NZ cherries and this provided data for this report even if the tone of the report is considered over-optimistic by some within the NZ industry. Most of the local NZ information has come from face-to-face interviews with orchardists, horticultural consultants, accountants working within the horticultural sector and industry body representatives to compile an overview the NZ cherry industry. NZ's position in the world cherry market is analysed using Porters 5 Forces (Dobbs, 2014). This model considers the threats of new entrants, buyer power, threats of substitution, supplier power and competitor rivalry in the context of NZ's export markets. Through the course of my research I met with and spoke to;

- Earnscy Weaver. Weaver Horticulture
- Tim Jones. 45^0 South
- Charles and Jenny Roberts. Pong Creek Cherry Orchard
- Jered Tate. Fairview Orchards
- Matt Blanche. Sarita Orchards
- Lachie and Gretchen McNally, Eanscleugh
- Blair Fieldes. ANZ Bank
- Alex Huffadine. Otago Polytechnic, Cromwell
- Alistair King. Crowe Horwarth
- Nigel Smellie. Crowe Horwarth
- Anne Ashby-Neilson. SBS Bank
- Marie Dawkins. SummerfruitNZ

Growing Environment

Clearly the Central Otago climate is generally suitable for cherry production given that around 85% (Coriolis, 2018) of NZ's planted cherry area is located in the region. The main growing areas are in and around Cromwell, Ripponvale, Earnscleugh and Roxburgh. Relatively new areas towards Lowburn, Mt Pisa, Bendigo and Tarras are all locations that have new orchard developments and might be considered 'non-traditional' cherry growing areas. From discussions with those in the sector, there is a general wariness of the cultivation of new orchards in non- traditional areas. However there is also a belief that there is an inherent conservatism within the sector and these new plantings will help with innovation and the progression of risk mitigating strategies and techniques that would further develop the industry.

One of the key features of the Central Otago region is the high diurnal range (DRT). This is the difference between daytime and night-time temperatures. Due to the continental type climate in Central Otago, the DRT is large and is thought to positively contribute to increasing the sweetness of Central Otago cherries. This also assists with the firmness and crunch of the fruit which enhances the flavour, taste and general appeal to the consumer, particularly in the Asian markets.

Climatic requirements

Cherries have particular climatic requirements with both yield and quality parameters affected by inclement weather events such as rain, frost and cool temperatures.

The ideal set of climatic conditions can be summarised:

- Adequate winter chilling to ensure even and full bud break in spring.
- No severe frosts and little rainfall from late August to late October to ensure maximum pollination (by bees) and maximum fruit set.
- Temperatures above 13°C during the blossoming period to ensure adequate bee activity.
- Low summer rainfall to minimize fruit damage (cracking) and reduce disease pressure.
- Low humidity throughout the growing season to minimise disease outbreaks.
- Low to moderate winds to minimise physical injury to trees and fruit while providing sufficient aeration to reduce humidity within the crop.
- Adequate access to water for irrigation requirements.

Adapted from Cherry Growers Australia Inc, 2011 (Paul James,

Winter chill

Cherries require a period of winter chill or vernalisation to meet the plants dormancy requirement. Once this has been met and, with an increase in spring temperatures, this dormant period is finished. Most NZ cherry varieties have a chilling requirement of around 1000 hours, based on the Richardson model (Richardson, 1974) of chilling requirements. This model prescribes a chill unit that quantifies chilling intensity at 7^0C. Chilling intensity decreases down to 2^0C and up to 12^0. Beyond these temperatures no further chilling is accumulated, in fact above 16^0C you can get de- vernalisation, as shown in Table 1 below:

Table 1: Richardson Chill Model (E. A. Richardson, 1974)

Temperature (°C)	Chill units
<1.4	0
1.5 - 2.4	0.5
2.5 - 9.1	1
9.2 - 12.4	0.5
12.5 - 15.9	0
16 -18	- 0.5
> 18	- 1

In practice, achieving adequate chilling in Central Otago is not a risk factor with the 1000 hour chilling requirement is usually achieved by the end of August or early September.

Growing degree days

Growing degree days (GDD) is a standardised method of calculating accumulated temperature over a given period of time and correlates to different growth stages of the fruit right up until full maturity and harvest. This methodology is commonly applied to horticultural crops to describe how much temperature accumulation individual species, and even individual varieties within species, require to meet certain growth stages.

GDD is calculated by $\frac{Tmax + Tmin}{2}$ - base temp

An example would be; $\frac{20^0C + 10^0C}{2}$ - 100C = 5^0C

This calculation is made on a daily basis and accumulates to provide a seasonal figure. Cherry requirements vary between varieties but sit within the range of 800 – 900 GDD's (Paul James, 2011). National Institute of Water and Atmospheric Research (NIWA) records show that Cromwell's GDD has ranged between 822 & 1253 since 1950. (Otago Regional Council, 1970 - 2001)

For new production areas it would be advisable to undertake some specific site testing as micro climatic factors such as local winds and topography could affect the specific growing conditions and will therefore influence decisions around variety selection, target market and orchard investment.

Site selection

In addition to specific climatic requirements, overall site selection needs to consider several additional factors;

Soil type

Cherries prefer soils that are free draining to ensure that the trees don't sit in wet conditions for any length of time. Soils can be heavy but need to have good structure and readily drain. However lighter soils are preferred assuming good irrigation systems and irrigation water are available which is a primary requirement in Central Otago.

Water availability

Irrigation is critical for cherry production in Central Otago and without surety of good water supply for irrigation along with contingencies, such as a storage pond, then the planting of an orchard should not be considered.

Topography

While cherries can grow on steeper land these conditions make it difficult to manage the crop, particularly for vehicles if conditions are wet and slippery. Orchards should be located on flat or moderately sloped land ensuring that tractors and sprayers are able to operate on the orchard to carry out operational tasks.

In Central Otago, in most seasons, some frost fighting will be required during critical periods. Cold air moves downwards and therefore topography is an important element in the frost risk of a property. Orchards that are placed at the very bottom of a valley where the air cannot move further downwards and where cold air sits are the most vulnerable. Orchards should ideally be situated in locations where the cold air is able to move through the orchard and down to lower altitudes to reduce the amount of time that cold air will sit within the orchard. This will help reduce frost risk and crop damage.

Growing Risks

Rain (fruit-cracking)

Rainfall is the main cause of fruit cracking in Central Otago. An event of 2.5mm (Blakey, 2017) is the general threshold to cause a cracking event. The key risk period of rainfall is within the two weeks prior to harvesting. Fruit cracking renders the fruit unmarketable and in such cases the fruit is left on the tree and not harvested. A secondary cause of cracking is periods of high humidity though this rarely occurs within the Central Otago climate. The water from the rain that lands on the cherry is rapidly absorbed into the fruit by osmosis and the cherry cannot process this excess water fast enough causing swelling and cracking in the skin.

Managing rain risk

Rain-covers:

Not currently widely used, primarily due to high costs and practicality. It's likely that the use of rain covers will increase as NZ planting systems become more compatible. Rain-covers can alter the climate underneath the rain-covers by increasing humidity. This can affect the profile of fruit diseases though new systems allow for a more open environment while still protecting from rain. One grower in Central Otago has recently built a fully enclosed system with retractable roofing (Otago Daily Times, 2018) that also allows a fully controlled growing climate.

Helicopters:

Helicopters are used after a rainfall event to hover over the orchard and blow excess water from the cherries by downward wind pressure from the rotors. Helicopters are only effective against shorter duration rains and can be expensive at around $2,500 per hour. Often the cost can be shared across several neighbouring orchards if they have been affected. An alternative system, some growers will use their orchard crop sprayers. The sprayers have a fan mechanism that is more commonly used to blow pesticides into the trees but also reasonably effective at removing moisture from the fruit.

Variety spread

Having a range of cultivars that have differing maturity dates in the orchard can mitigate against rain damage by not having all varieties at a sensitive growth stage at the same or similar times.

While no variety is resistant to cracking, there are some that are more susceptible than others and this could be part of your decision making process when selecting varieties.

Calcium sprays

Calcium chloride ($CaCl^2$) is applied as a spray onto the cherries to draw moisture out of the cherry through osmosis and can reduce the level of cracking though it will not eliminate it completely.

Frost risk

Frost risk, along with rain, is one of the critical climatic events that can significantly affect seasonal cherry production in Central Otago. Table 2 outlines the level to which the cherry trees can withstand frost in relation to their stage of development.

Table 2: Frost effects at different growth stages of the cherry bud. Table adapted from Patterson (Paterson, 2003)

Bud Development Stage	1 First Swelling	2 Side Green	3 Green Tip	4 Tight Cluster	5 Open Cluster	6 First White	7 First Bloom	8 Full Bloom	9 Post Bloom
Old Standard[1]	-5	-5	-3.9	-2.2	-2.2	-1.7	-1.7	-1.7	-1.7
Avg. Temp 10% Kill[2]	-8.3	-5.5	-3.9	-3.3	-2.8	-2.8	-2.2	-2.2	-2.2
Avg Temp 90% Kill[2]	-15	-12.7	-10	-8.3	-6.1	-4.4	-3.9	-3.9	-3.9
Avg. date (Prosser)[3]	5 Sep	13 Sep	23 Sep	27 Sep	1 Oct	4 Oct	8 Oct	13 Oct	21 Oct

1 – 'Old Standard' is the lowest temperature that can be endured for 30 minutes without bud damage
2 – Temperature at which 10% & 90% of buds will be killed
3 – Dates in Central Otago when the respective developmental stages are reached

The first step in managing frost risk is monitoring temperature though the use of a reliable and accurate weather station. These systems can be alarmed to warn of impending critical temperatures and allow the orchard manager to activate appropriate frost fighting systems. There will typically be around 7 frost fighting 'events' per season in the Central Otago region and in some years no events during the critical periods. The majority of Central Otago orchards will typically employ one or more of the following methods for frost fighting; Water spray for fruit protection, a diesel frost pot, fixed windmills for air disturbance and helicopters for air disturbance.

Table 3: Description of frost fighting techniques and effectiveness

System	Method	Effective to:	Pros	Cons
Helicopters	Move warm air from inversion layer into orchard.	- 5^0C	Effective if inversion layer is present	Expensive ($2,500/hour), especially if many events of long duration. May need to pay pilot and helicopter to be on stand-by
Wind turbines	Move warm air from inversion layer into orchard.	- 3^0C	Effective if inversion layer is present. Diesel 20l per hour.	Upfront capital cost $65,000. One turbine per 4-6ha
Water spraying onto fruit	Water sprayed onto fruit. Water film forms between fruit and ice, protecting the fruit.	- 5^0C	Effective and relatively inexpensive, depending on cost of water and pumping	Can exacerbate disease in orchard, fungi and bacterial blast. Uses a lot of water – 50 ml/event in cold conditions. Nutrient leaching
Water spraying onto soil	Under tree irrigation wetting the soil	- 1^0C	Effective in minor frost events. Might be combined with helicopters or turbines	Uses a lot of water, 50 ml/event, which can promote nutrient leaching
Bird nets	Create an enclosed space environment	- 0.5^0C to - 1^0C	Already installed – just need to be closed. In combination with wind turbine or helicopter.	Would be used in addition to other methods
Frost pots	Diesel burners producing heat within orchard. 25 per ha required	- 0.1^0C to - 2^0C	Effective, especially in combination with wind turbines. Doesn't require inversion layer to work, though does help.	Expensive and labour intensive. Each pot burns 10L per event

Hail

Physical damage from hail events can cause significant losses if they occur at critical times in the season. These events can be isolated and brief and also difficult to predict. The only real mitigating tool growers have is the use of bird nets which will prevent physical damage of hail bruising on the cherries themselves. There might be some subsequent wetting of the cherries and therefore drying required however the physical damage can be avoided with the use of nets.

Birds

Birds are highly disruptive in cherry orchards and can reduce yield by 100% (Tate, 2018) in some instances. All growers need to take pre-emptive measures to prevent such losses. Traditionally orchardists would use a combination of movement; motorbikes, dummy birds along with shooting, and noise to deter birds.

Losses with such techniques are likely to be 10% – 15% per annum (Huffadine, 2018). In recent years the majority of orchards have been covered with bird netting. The capital cost of nets is $50,000 - $70,000 per ha. This cost can be balanced against the other manual control methods of around $3000 per ha per annum combined with annual crop losses of 10% – 15%

Figure 1: Photo of a UFO system planting underneath bird nets

Pests and Diseases

This section focuses on invertebrate pests. Bird control has been discussed in Growing Risks and the other main vertebrate pests, rabbits, are dealt with through fencing, shooting, poisoning and trapping.

Black Cherry Aphid

This is a common pest in Central Otago which is controlled with a proactive spray programme. This aphid usually causes damage in November by limiting leaf growth and can severely stunt growth of young trees. Control is achieved through an essential mineral oil spray at the end of August. The pest should be monitored through the growing season with follow up sprays as required.

Figure 2: Black Cherry Aphid (Oregon State University)

Cherry Slug

This slug causes most damage towards the end of the growing season, around February, with damage manifesting itself as leaf defoliation. As such, damage to the standing crop is minimal and growers may choose to only spray if damage and numbers are high. February is an important time of the season to set-up the trees for production for the following season so close monitoring should be undertaken.

Leaf Roller Caterpillar

Typically one – two generations will appear each season and will eat the leaves through the summer. They are relatively easily controlled with insecticides and need controlling as part of an overall spray programme.

Bacterial canker (Blast)

Blast (*Pseudomonas syringae* pv. *Syringae*) is a common disease in Central Otago cherry orchards. The disease causes a gumming substance to appear on the trees, with internal yellowing and 'streaking'. Eventually the affected parts of the tree will die. The disease can be spread through overhead irrigation and from open wounds caused by pruning or limb breakage. The disease is more prevalent where trees are stressed due to a poor growing environment. Unfortunately there are no chemical controls for this disease and so it needs to be managed through cultural means. Young trees that are affected should be removed from the orchard. Where branches of trees are affected, these should be pruned from the tree and removed. Prune in dry weather and seal wounds with a pruning paste to prevent further spread and infection.

Brown Rot

This fungus is difficult to control once it has established itself in the orchard so a proactive approach to control is encouraged. A routine fungicide is essential for control and needs to be adapted depending on weather conditions throughout the season. The disease forms on the fruit and causes rot rendering the fruit un-marketable. It is easily spread through fungal spores within the orchard and during winter on the ground. Treating the ground can be effective to reduce spore numbers in late winter and early spring.

Cultivar development

Within NZ the development and commercialisation of varieties is managed through privately owned nurseries that obtain the licence rights to propagate and market particular varieties within NZ. There is no breeding programme specific for NZ as there is with apples and kiwifruit. Plant breeding programmes are capital intensive and it is likely that NZ's small cherry industry is not large enough to warrant a specific NZ breeding programme. This is not to say that the varieties available in NZ are not suitable for our growing environment though it does limit our opportunities to further differentiate our product in the international market and to create brands around proprietary varieties. NZ's kiwifruit industry and their successful breeding programme that has produced the Zespri® Green and Zespri® Gold varieties around which the Zespri® brand is inextricably linked. This has been a key to their success in developing their international brand and controlling access, supply and value for their proprietary varieties in international markets (Beverland, 2001). To further differentiate NZ's cherries from international competitors the ability to develop distinct NZ cultivars could be an advantage.

Root stock

Rootstock is the rooted part of the cherry tree onto which different cultivars are grafted on. Different rootstocks have different growth characteristics and in different markets certain rootstocks will be selected based on growing environment, local conditions and the type of cultivars that have been selected to grow. In NZ we currently have only one root stock available which is called Colt. By comparison there are around 12 rootstocks available internationally (Fig. 3):

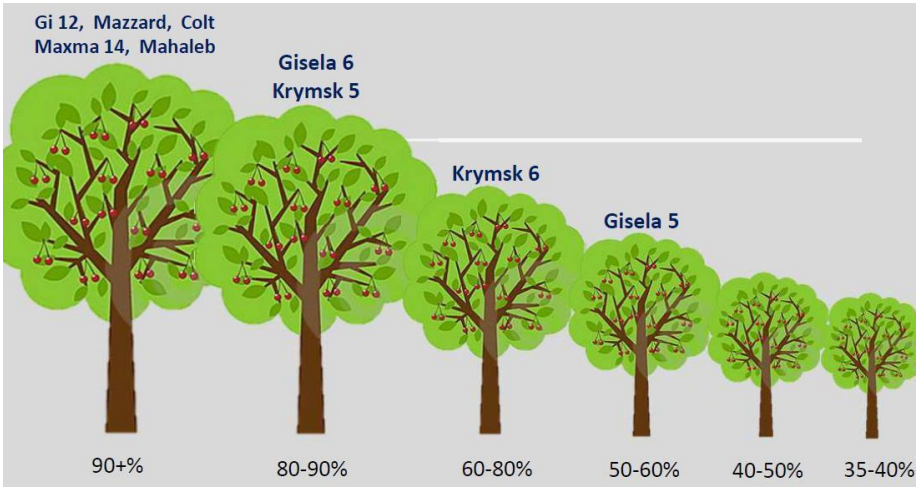


Figure 3: Cherry tree rootstocks by size (Lehnert, 2013)

NZ growers have become very adept at managing the Colt rootstock, primarily as there has not been another choice and it is generally suitable for NZ growing conditions. Some 'new-to-NZ' rootstocks are currently being tested however this is a lengthy and expensive process as biosecurity quarantine requirements need to be met. Cultivars also need to be tested across these new rootstocks to understand the best performing combinations in different growing environments. Perhaps a limitation of the private ownership model of cultivars in NZ is that different nurseries will have access to their own rootstock and varieties and so growers would not have access to all possible combinations. This might be an impediment to future orchard productivity development.

Cultivars

There are approximately 38 cultivars available in the NZ market which offer growers a range of maturity dates, disease tolerances, shapes, sizes, colours, taste, sweetness and firmness. Consideration of which varieties to grow needs to take into account a number of factors not least of which is the end market being targeted. This requires careful consideration of the time of season that a particular variety reaches harvest maturity so that the cherries are ready for that market, e.g. pre- Christmas market in NZ.

Industry Challenges

The cherry industry in NZ faces a number of challenges, some are particular to the cherry industry and some are applicable to the wider horticultural industry.

Labour

A lack of labour and especially skilled labour is the most critical of challenges to the horticultural industry and is especially important for cherries. The Central Otago harvest season, running from Mid-December through to early February, is arguably the most important time of the year and the requirement and importance to have available a large number of people for a short time period cannot be understated. According to an NZIER labour report in Horticulture (NZIER, 2016) the summer fruit sector is likely to experience a labour shortfall between 1078 and 1543 people for the 2018/19 harvest with the whole horticulture sector short of 6,423 people by 2023/24. The Recognised Seasonal Employer (RSE) Scheme, active since 2007, provides a system for workers from Pacific Countries to work in NZ for several months to help alleviate labour shortages. The number of RSE workers is currently capped at 11,100. The scheme is widely regarded as being very successful with willing and able workers supplementing local NZ workers, students and holidaying backpackers. Levy bodies, such as Horticulture NZ, are currently lobbying government to increase the number of RSE workers as this is viewed as being the most feasible system to cater for the seasonal labour requirements. The success of this system is predicated on the horticultural industry providing pathways for NZ citizens into seasonal or full time jobs within the sector

Biosecurity

Biosecurity is the biggest risk factor for NZ's primary sector and has experienced recent biosecurity incursions in NZ such as PSA in kiwifruit, Mycoplasma bovis in cattle, and velvet leaf in imported seed. These incidents can incur significant costs to control and manage, loss of production and can take years to recover from. For example, the NZ Ministry of Primary Industries (MPI) programme of phased eradication of cattle disease Mycoplasma bovis has budgeted $886m (MPI, 2018). The costs over 10 years for taking no action were calculated at $1.3b. If a NZ industry were to suffer from a catastrophic incursion that closed export markets, the affected sector could be decimated and it would take a significant amount of time to recover, if indeed it could recover. With increasing numbers of visitors into NZ along with ever increasing international freight movements the challenge of protecting NZ's borders is becoming more and more complex. Across the primary sector there will be, and should be, processes implemented to improve hygiene on individual properties to mitigate against pests and diseases being transported between individual properties.

Industry co-ordination

The cherry industry is a relatively small industry with approximately 90 growers cropping around 850 ha and 23 pack houses processing the annual crop (Coriolis, 2018). In addition to this there are 26 export companies with a Horticulture Export Authority (HEA) licence to export outside of NZ. While there are two pack-houses and exporters that manage more than 30% of the NZ cherry crop, outside of this, the industry is marked as being very fragmented with many small growers, many pack-houses and exporters with little obvious coordination in production, processing, marketing and sales.

There are some good examples of coordination such as Central Otago Premium Fruit Limited (Central Otago Fruit, 2018). Several growers have come together to market a proportion of their fruit and have partnered with local and international distributors, the Central Otago District Council and regional tourism office to establish a brand linked with region and its people. There appears to be further opportunity for such co-ordinated initiatives. With the trend towards larger orchards which are vertically integrated and have access to greater levels of capital it is likely that there will be consolidation overtime and greater use of collective positioning, especially in export markets.

New Technology

The development and evolution of technology in cherry orchards will be driven by economic need or imperatives. Can technology reduce costs, improve yields and in turn improve returns? In addressing the challenges of the cherry industry the main drivers of innovation are focused on reducing reliance on labour and its associated costs as well as improving the ability for precision management. Across the international horticultural sector, there are a number of technologies focused on automation, robotics for harvesting and crop management tasks such as spraying, crop sensing for detection of pests, disease and irrigation monitoring (Zhang, 2018).

The use of robotics for harvesting is a technology that could revolutionise the horticulture sector as it will directly address the issue of labour availability and cost. For example, NZ company, RoboticsPlus, (Plus Group, 2018) is currently developing their Autonomous Mobile Modular Platform (AMMP) which is intended to be a harvesting system but can also be used for other tasks such as targeted spraying, crop sensing and fruit quality testing. While the mechanics of such systems will be adapted to different types of crops, the principles and technology behind these systems will have broad application. Such technologies will have the potential of reducing labour requirements, increase the precision of orchard management, improve consistency of fruit quality and reduce the level of inputs.

There are two key challenges with cherries that make the application of robotics difficult (Zhang, 2018). The first is that cherries require both the cherry and stem to be picked together. Consumers expect that cherries will have the stem attached when purchased. Also, the loss of the stem opens a 'wound' in the cherry that is an open source for bacteria and rot. Currently there is no proven mechanical harvesting system for the harvesting of cherries where such a system needs to replicate the human hand for speed, efficiency and quality of harvesting. This remains a manual task for the time being (Zhang, 2018).

The second challenge, which is not particular to just cherries, is orchard design and its suitability to facilitate future automation or mechanisation. Traditional orchards systems are based on low tree density, 600 – 800 plants per hectare, with row widths of five meters and intra-row spacing of three meters, which allows a traditional centre leader tree to grow and take a 3-Dimensional (3-D) form.

Figure 4: Centre Leader Cherry Tree (L. Long, 2015)

There are around seven different training systems for cherry trees (L. Long, 2015) with each system offering differing benefits and requiring different management techniques. However, for systems that can help with the challenges the sector is facing and to allow for robotics and other automated systems to be applied in the future, it is crucial to look at a total systems approach (Zhang, 2018). For this reason there is growing interest in new planting systems commonly known as Upright Shooting Offshoot (UFO). The UFO systems has been used widely in other countries, particularly in North West United States (US).

Upright Shooting Offshoot (UFO) System

The UFO system is characterised by narrow (down to 2m) width between rows and 2m – 3m between plants within rows with plant densities of around 1300 – 1600 plants per ha. Trees are trained along wires that run the length of a row to form a two dimensional & uniform 'wall' of cherry trees that in the future will allow increased mechanisation and automation. These fruiting or planar walls are managed

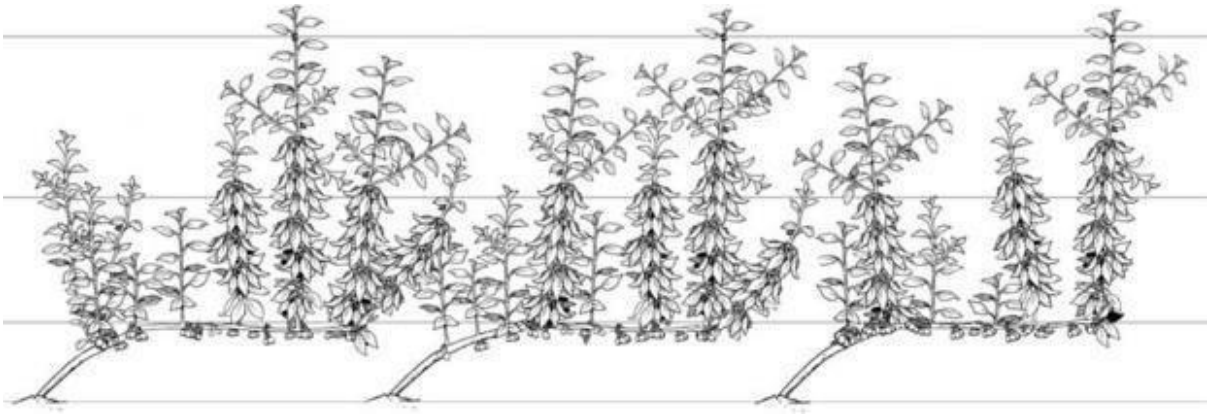


Figure 5: Upright Fruiting Offshoots (UFO). (L. Long, 2015)

to about two – three meters in height, compared to four – six meters for conventional trees and create a pedestrian orchard where most work can be done from the ground.

The main objective of the UFO system is to improve productivity and yields per ha. This is achieved by increasing the level of light interception into the orchard with the expectation that more light captured will improve yields. This is demonstrated below, (Fig. 6) showing with apples, as light interception increased, fruit yield also increased.

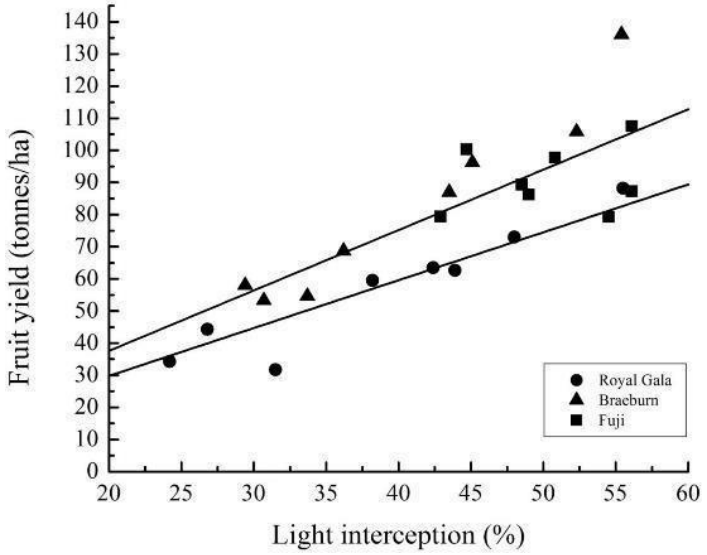


Figure 6: Light interception and fruit yield (J. W. Palmer, 2002)

This UFO system is already being applied into commercial cherry and apple orchards in NZ and even without mechanisation and automation these orchard systems offer a number of improvements in simplifying orchard management.

Labour

The two-dimensional (2-D) structure of the UFO system simplifies a number of labour operations within the orchard, pruning and harvesting in particular.

Pruning

Pruning of a conventional centre-leader orchard where every tree within in the orchard is unique, is three-dimensional (3-D) and requires an individual and tailored approach for each tree and requires experienced and skilled labour to complete such work. Pruning cherry trees has been described as a mix of art and science and the approach very subjective. It is said if you have 10 horticulturists standing around a cherry tree, there will be 10 different approaches to pruning the tree. The UFO system simplifies the pruning process as every tree is pruned in the same way in a clearly defined process meaning that someone can be trained to prune in twenty minutes and therefore the requirement for skilled and

experienced labour is reduced. In addition, the time to prune a hectare of UFO cherries is around half (Huffadine, 2018) of that required for a conventional orchard, reducing labour cost per ha for this task.

Table 4: Main advantages of the UFO training system for cherries

UFO System	
Key Advantages	
Faster pruning time	Earlier first harvest
Simplify pruning, harvest	Set up for future automation/mechanisation
Lower canopy height - pedestrianised	High light interception
Higher yields	Simplify crop load management

Harvesting

The other key aspect of labour management in the UFO system is the improvement in ease and speed of harvesting compared to conventionally planted centre-leader orchards. Because of the 2-D nature of the UFO system and the low canopy height, pickers during harvest can move along the wall of cherries picking from the ground with only occasional use of a ladder required. This contrasts with conventional centre-leader orchards where pickers are moving around a 3-D tree, constantly moving up and down a ladder trying to pick efficiently with speed. As pickers are usually paid per kilogram (kg) picked, then the actual cost of harvest per hectare is unlikely to be lower, though harvesting will be faster. Harvested yields are more likely to increase as all fruit can be easily seen and are more accessible with potentially less fruit wastage left on the tree. North American cherry growers have reported that pickers on UFO orchards are able to pick on average nearly 68.5 pounds (~ 31 kg) of fruit per hour compared with 39 pounds (~ 17.5 kg) per hour on a conventional orchard (Good Fruit Grower, 2011). Pickers prefer to harvest on UFO style orchards as it is easier, they are able to earn more as picking rates will be higher and with competition between orchards for labour, the UFO orchards may find it easier to attract harvest labour.

Yield & Time to Harvest

The UFO system and its application under the Plant and Food project, Future Orchard Planting Systems (FOPS), is intended to provide a step-change in the productivity and efficiency of NZ orchards. The FOPS system is essentially the same as the UFO planting systems. As discussed already, these systems are likely to enable more efficient use of labour. However the FOPS trial results and yields seen in commercial UFO orchards, indicate there are also significant benefits in yield per hectare and shortening the time taken for trees to come into commercial production.

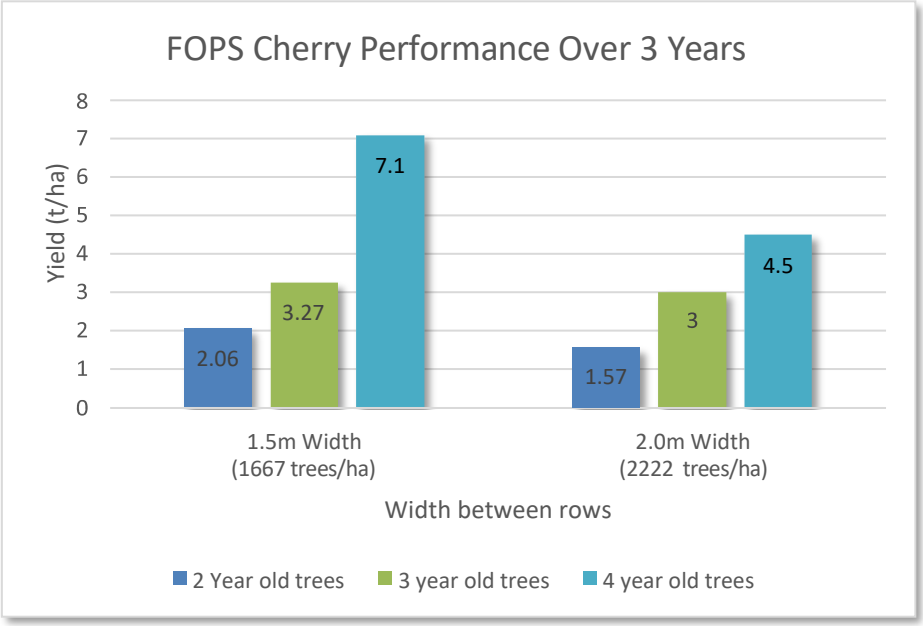


Figure 7: Adapted from Plant & Food Research (Jill Stanley, 2018)

In recent research conducted by Plant & Food in Clyde, Central Otago (Fig. 7) the FOPS system showed competitive yields in cherry trees aged two, three and four years. Considering the industry average yield is approx. 8 t/ha (SummerfruitNZ, 2017/2018) and that conventional orchards don't typically come into production until the fourth season from planting these yields are very good. Due to the failure, owing to Blast, of the conventional centre leader cherry plantings in the Plant & Food trial, they were unable to show a direct comparison in yield between centre leaders and the FOPS system. However, on the same site and in the same trial, although with Apricots, a direct comparison between systems was able to be made with the results in Table 5 below. Significant yield increases of the FOPS plantings at two different densities compared to the centre leader indicates the potential yield improvements of these systems.

Table 5: Adapted from Plant & Food Research (Jill Stanley, 2018)

FOPS Yield Trial Three-year-old apricot tree yields			
Cultivar/ selection	FOPS 2.0 m spacing 1667 trees/ha	FOPS 1.5 m spacing 2222 trees/ha	Centre leader 4 m spacing 833 trees/ha
Apricot Cultivars (tonnes/hectare)	5.4	5.9	2.0
Percentage increase over centre leader	270%	295%	-

This research aligns with commercial experiences in UFO systems where cherry orchards are averaging 12t/ha (A. Huffadine, pers comm) compared to the wider industry average of 8t/ha. This 50% average yield increase indicates the value of the research and the productivity gains that these new systems can offer and the implied improvement in profitability of such an orchard system.

Costs of establishment

The specific costs of establishing a UFO orchard system compared to a lower density conventional orchard system is set out in detail in the Financial Section of this report. The main increases in costs are related the volume of infrastructure required. More plants per hectare, 1,600 compared to 800, posts to support the training wires along each row along with the wires themselves. With the increased number of rows a greater volume of irrigation pipes are needed to carry water along each row. While not insignificant, the establishment costs outside of these items are the same as for a conventional orchard.

Industry structure

While in any context, the NZ cherry industry is relatively small, it is rapidly expanding in size and that will create opportunities and potentially some challenges. The increased size and scale of the industry will bring more funding into the levy body, SummerfruitNZ, which should bring greater resources for promotion, research and development and general support for the sector. The challenges are likely to be managing the rapid growth, the increase in total production and ensuring the collective industry is working towards shared goals.

There is limited published information on the NZ cherry industry with respect to number of growers and hectares grown in NZ, however production statistics generated by levy collection at the first point of sale provides some useful data.

Growers

NZ has approximately 80 – 90 cherry growers with an average area of 7.3 hectares (Coriolis, 2018). The mix of cherry growers are broadly categorised in Table 6.

Table 6: Typical orchard ownership structures and trends

	2 – 5 hectares	**5ha – 20 ha**	**20ha+**
Ownership	Absentee owners. Lifestyle operators. Retired.	Part of an existing orchard. Owner/operator	Private, corporate or syndicated ownership. Likely to own/operate pack house & export
Orchard Management	Self-managed or contract managed	Self-managed with seasonal labour as required	Management with permanent staff. Seasonal labour as required
Future outlook	Decrease in number.	Increase in area through expansion of new orchards or acquisition	Increase, even larger orchards – 100ha+. Mostly new orchard developments

Area

The current area in NZ under planting is approximately 850ha (Coriolis, 2018), of which 85% (~722ha) is in Central Otago (SummerfruitNZ, 2017/2018). From current reported plantings and stated future plans this area is forecast to expand to around 1500ha over the next 5 years (Fig 8).

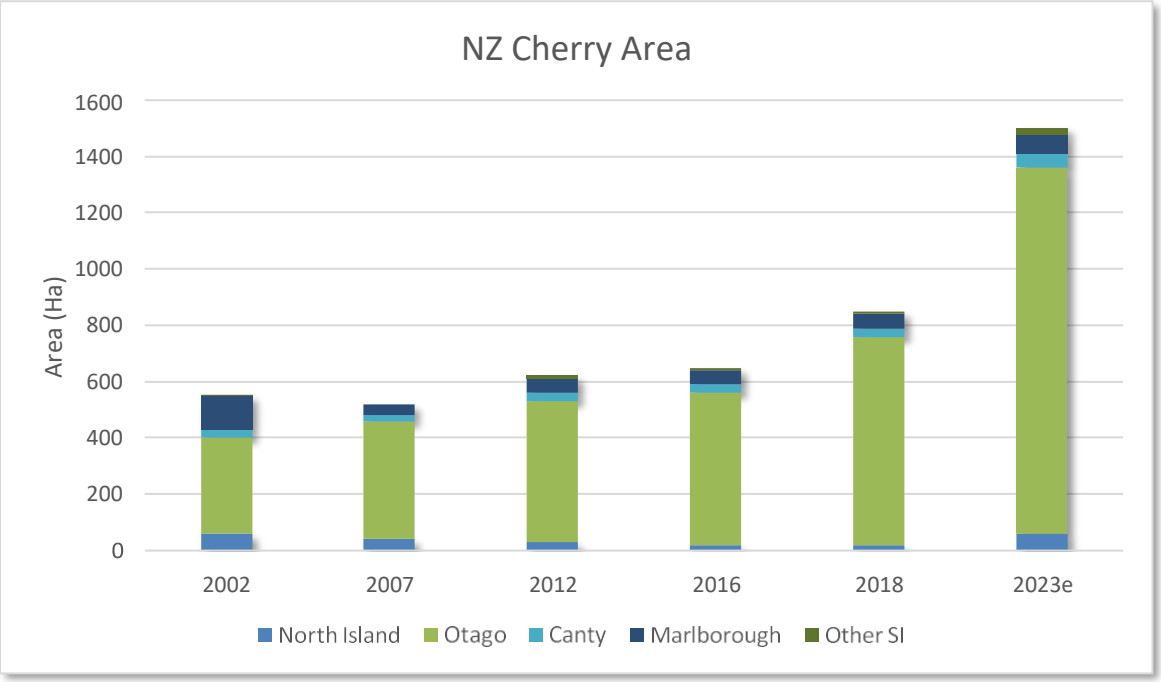


Figure 8: NZ cherry area (ha). Based on (Coriolis, 2018) and industry interviews

Most of this expansion is coming from planned corporate projects or syndicates with only a few organisations responsible for this expansion. For example, Phil Alison, the developer and founder of Rockit™ apples has recently entered the cherry industry through the purchase of existing orchards and bare land for plantings and plans to produce 8000 tonnes in the new growing systems (Logistica, 2018) which would equate to approximately 650ha. These planned plantings are significant for the industry as it is an opportunity for new jobs, increased exports earnings and the potential for greater innovation within the industry. It will also bring further competition for labour at peak times and skilled labour for the management of these orchards, both issues that are already affecting the wider horticulture industry.

Production

With an increase in the area of cherries being planted, production will expand and with the majority of new plantings likely to be planted in the more efficient UFO systems, there will probably be a production uplift per ha planted (Fig.9).

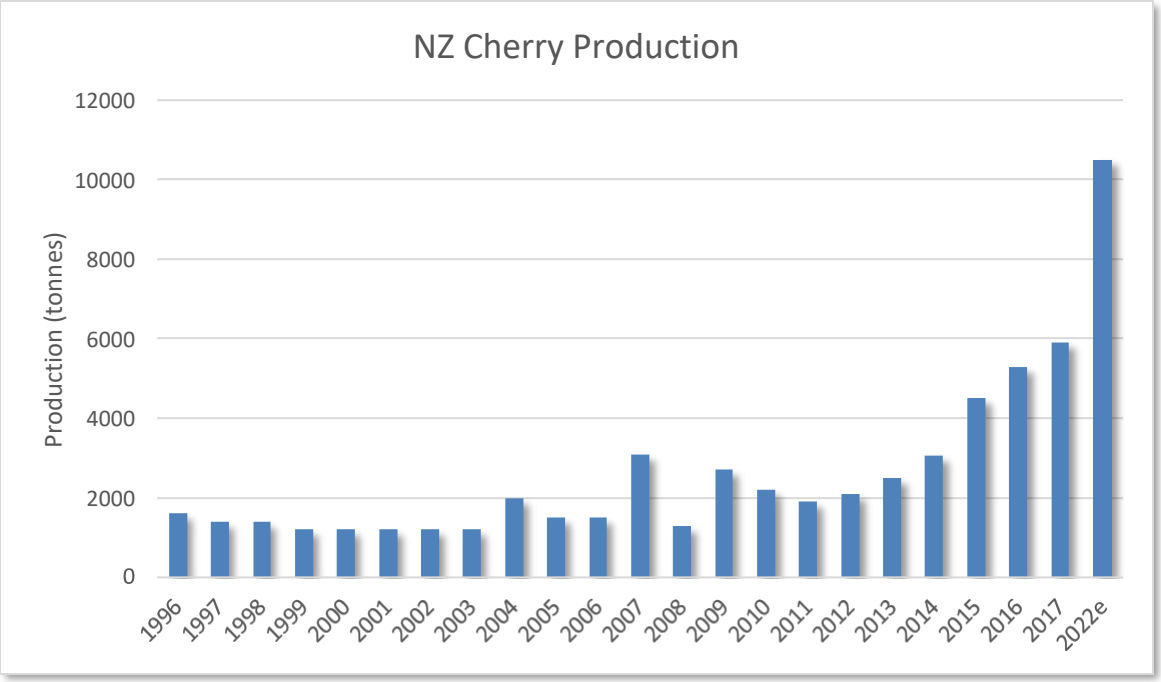


Figure 9: NZ cherry production volume, past and forecast. (Coriolis, 2018) (SummerfruitNZ, 2017/2018) & own estimates)

The key challenge for the industry is to manage this growth, to facilitate grower's market opportunities and to help growers source the required labour to ensure each season's fruit is harvested in a timely manner.

Packers & Export companies

It is unclear how many packhouses are operating within the cherry sector in NZ. It is only those packhouses that are licensed exporters under the Horticulture Export Authority (HEA) that are known. There are a number of small grower/packhouse operations that just supply local market and therefore are not required to be licenced. In order to ensure their cherries will be packed, growers will need to have a contract or agreement with a packhouse for the sale and packing of their fruit.

Currently there are 26 export companies licensed under the HEA scheme. As the trend towards fewer and larger cherry organisations evolves there is a move towards vertically integrated operations: **Grower > Packhouse > Exporter** with these enterprises having the ability to capture margin and value at each point in the value chain.

SummerfruitNZ

SummerfruitNZ is the levy body that represents growers of apricots, nectarines, peaches, plums and cherries. The levy is charged at 0.75% for cherries and 1.5% for the other fruits and is collected at first point of sale and paid to SummerfruitNZ. SummerfruitNZ's main areas of responsibility are:

- Industry profile and administration
- Research and development
- Export and compliance
- New Zealand market
- Communication and education

Cherries are the largest sector, by value and volume, of the five fruits by that make up SummerfruitNZ:

Table 7: NZ production volume & value of summer-fruit, 2017/18 (SummerfruitNZ, 2017/2018)

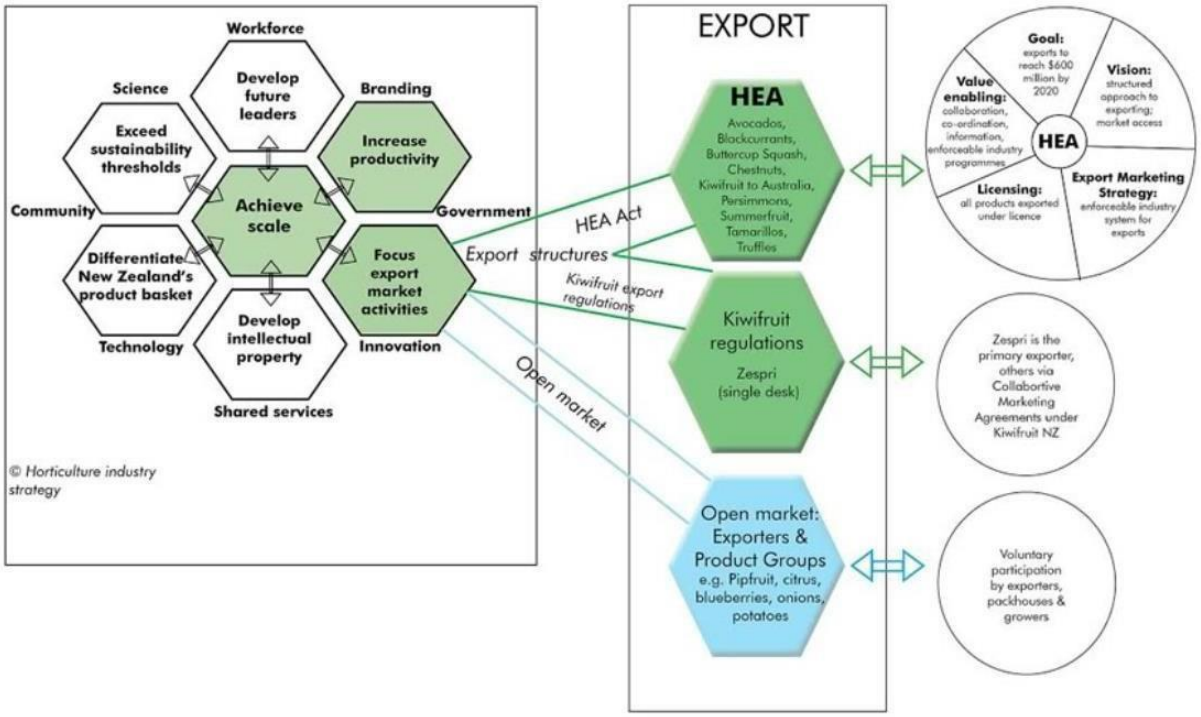
	Apricots		Cherries		Nectarines		Peaches		Plums	
	Volume (tonnes)	Value (NZD)	Volume (tonnes)	Value (NZD)	Volume (tonnes)	Value (NZD)	Volume (tonnes)	Value (NZD)	Volume (tonnes)	Value (NZD)
NZ Market	1,804,505	$5,864,641	1,652,944	$9,091,192	2,777,329	$9,720,652	2,319,051	$8,116,679	2,148,577	$6,445,731
Export	451,109	$2,828,541	4,244,809	$84,119,816	20,942	$118,830	92,941	$596,046	52,079	$298,282
Combined	2,255,614	$8,693,182	5,897,753	$93,211,008	2,798,271	$9,839,482	2,411,992	$8,712,725	2,200,656	$6,744,013

Horticulture Export Authority (HEA)

Approximately 75% of NZ's cherry production is exported and so the HEA plays a critical role in implementing quality standards across the summer fruit industry. The HEA, as a statutory body, works with each horticulture product group to decide on an Export Marketing Strategy (EMS).

These are the rules and strategies designed to achieve the sectors vision and goals. The HEA also manages the export licensing system which anyone wishing to export cherries must apply for and receive this licence for export. This system establishes processes and standards for exporters to follow and enables the industry to ensure that basic quality levels exporters are required to meet are high.

Figure 10: Health Export Authority - roles & responsibilities (HEA, 2018)



Markets

With approximately 75% (SummerfruitNZ, 2017/2018) of annual cherry production exported and with a forecasted growth in area and volume produced, the export market proportion of NZ's total production will continue to grow relative to the local NZ market. The two key reasons why the majority of our fruit is exported is that NZ consumption is traditionally limited to the period up to and over Christmas as Kiwis don't tend to eat cherries at other times of the year (Coriolis, 2018). Secondly, the prices received internationally, particularly in Asian markets, makes it more attractive for exporters to send their fruit abroad rather than supply NZ outside of the Christmas season.

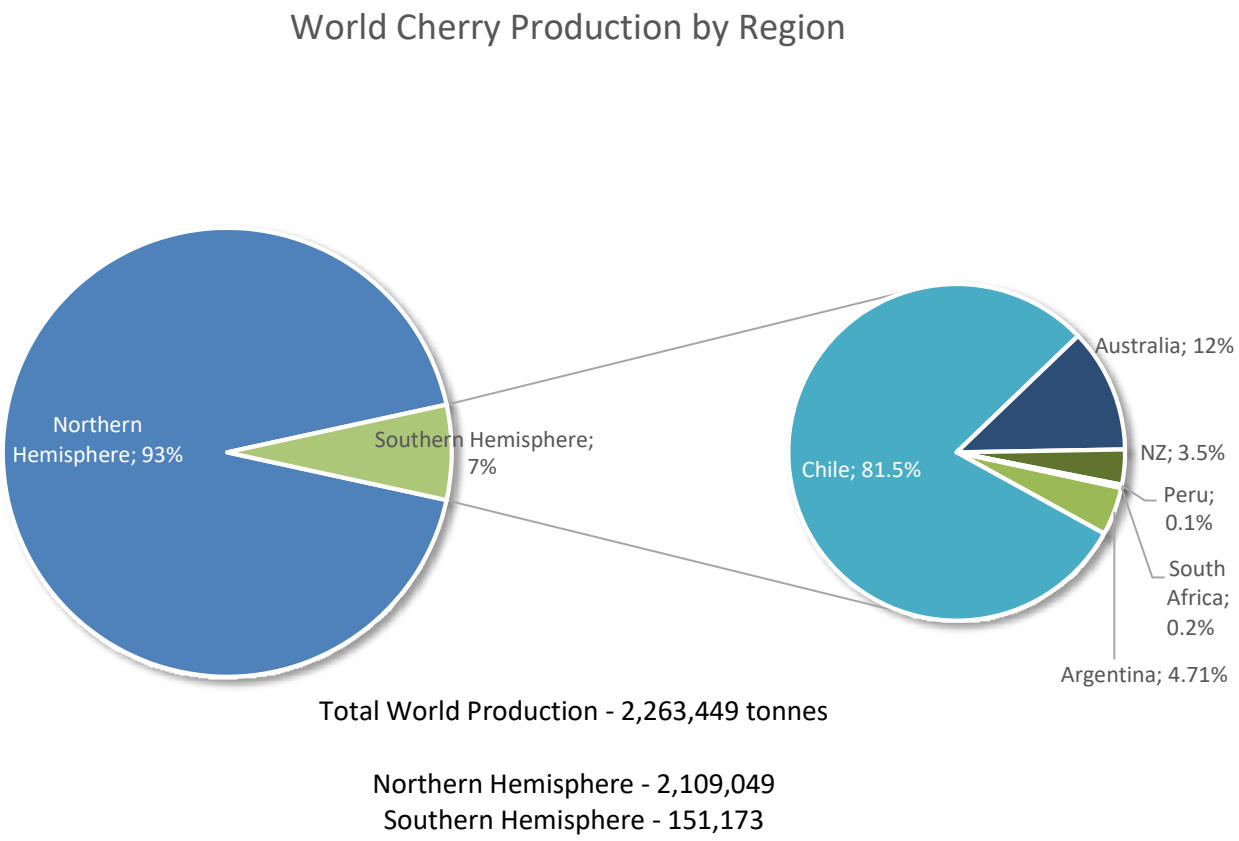


Figure 11: World Cherry Production. (FAO, 2016)

As stated previously, NZ is a very small producer of cherries (Fig. 11) but we have the advantage of being in the Southern Hemisphere so we can supply cherries into Northern Hemisphere markets during their winter without competition from Northern Hemisphere producers. We also have the advantage of producing high quality fruit with high level food safety standards. Consequently, produce from NZ is generally very well perceived in European and Asian markets. This is

demonstrated by the high value which NZ is able to achieve (Fig.12). While producing only 5% of the world's production, the Southern Hemisphere is achieving almost half the world's export value.

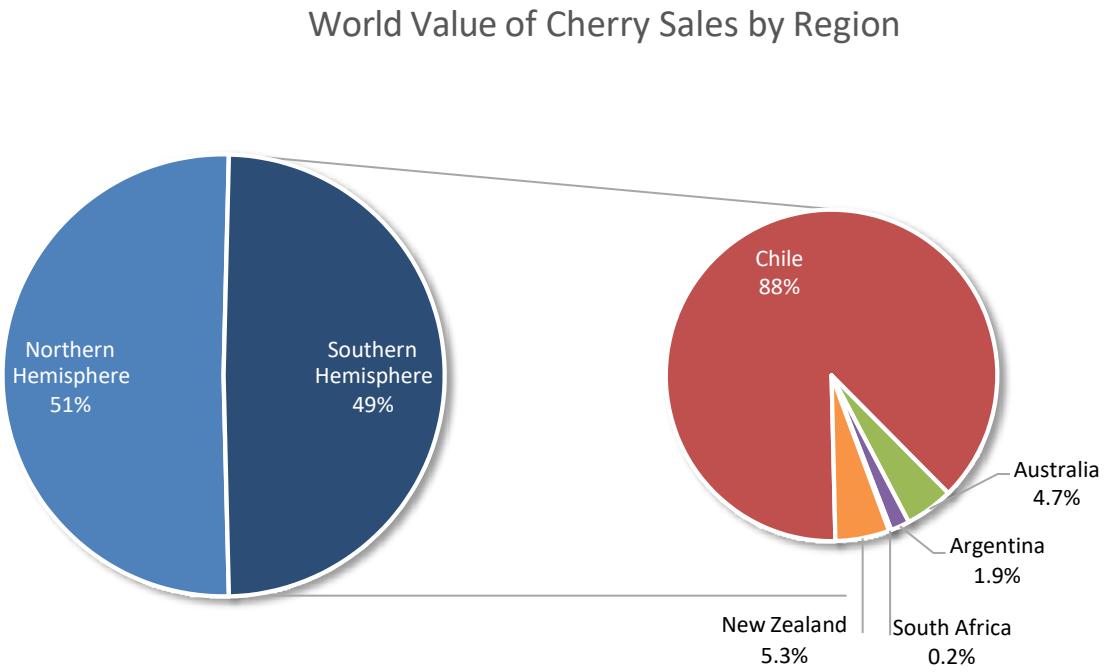


Figure 12: World Export Value for cherries. (FAO, 2016)

NZ Market

The NZ market, otherwise known as the local market, runs for approximately 2 weeks before Christmas and finishes just into the New Year.

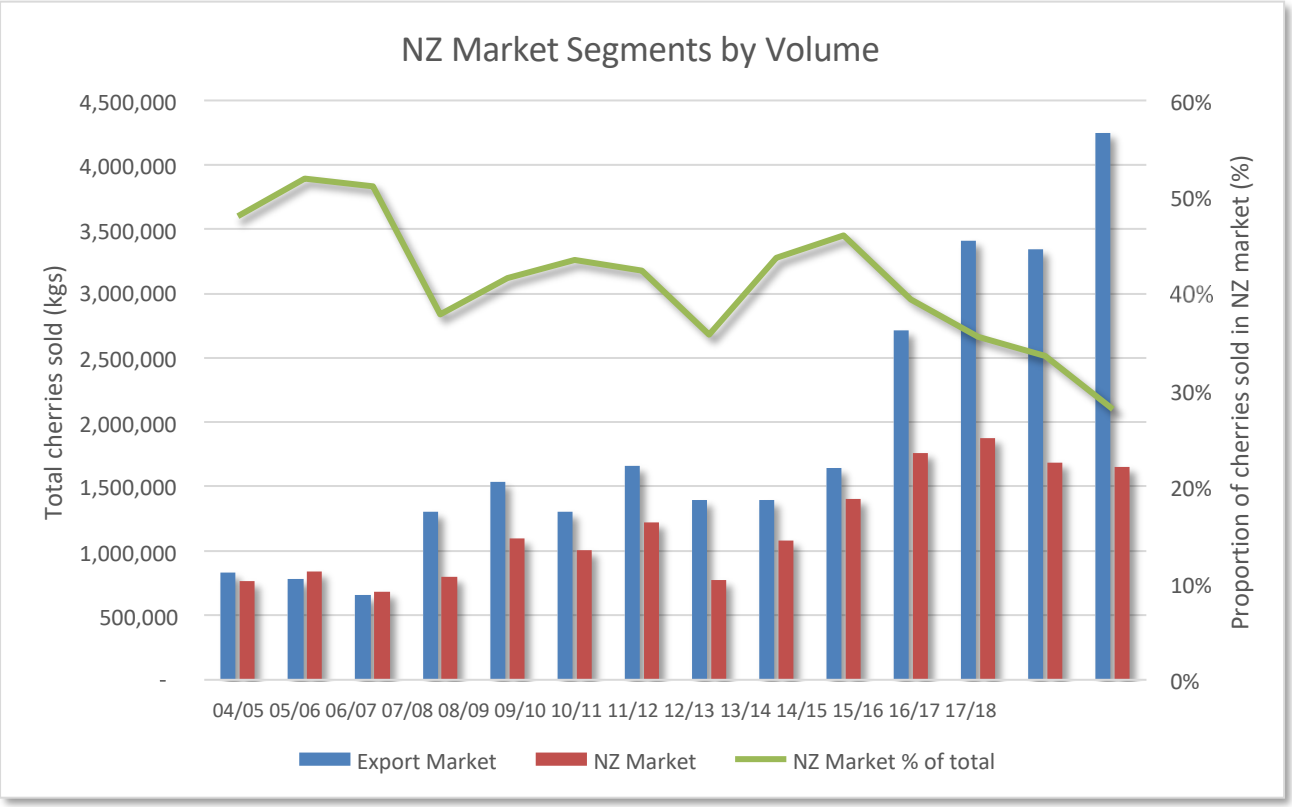


Figure 13: Total NZ cherry sales - export and NZ market

For producers, the prices in the pre-Christmas NZ market are generally as good as the export market though post-Christmas, depending exactly on production, prices will slip to less than half the pre-Christmas levels and producers will move towards supplying export markets in preference to the local market. This understanding will impact on how an orchard will be managed and the variety choice to determine which market to target.

Export Market

The export market is currently described as a 'pull market' according to those within the industry (Marie Dawkins, pers comm, 2018) with particularly high demand for NZ cherries from China. Nevertheless, NZ's exports are well diversified across a number of countries that provide good returns and also reduces the risks of relying on a narrow number of markets (Fig. 14).

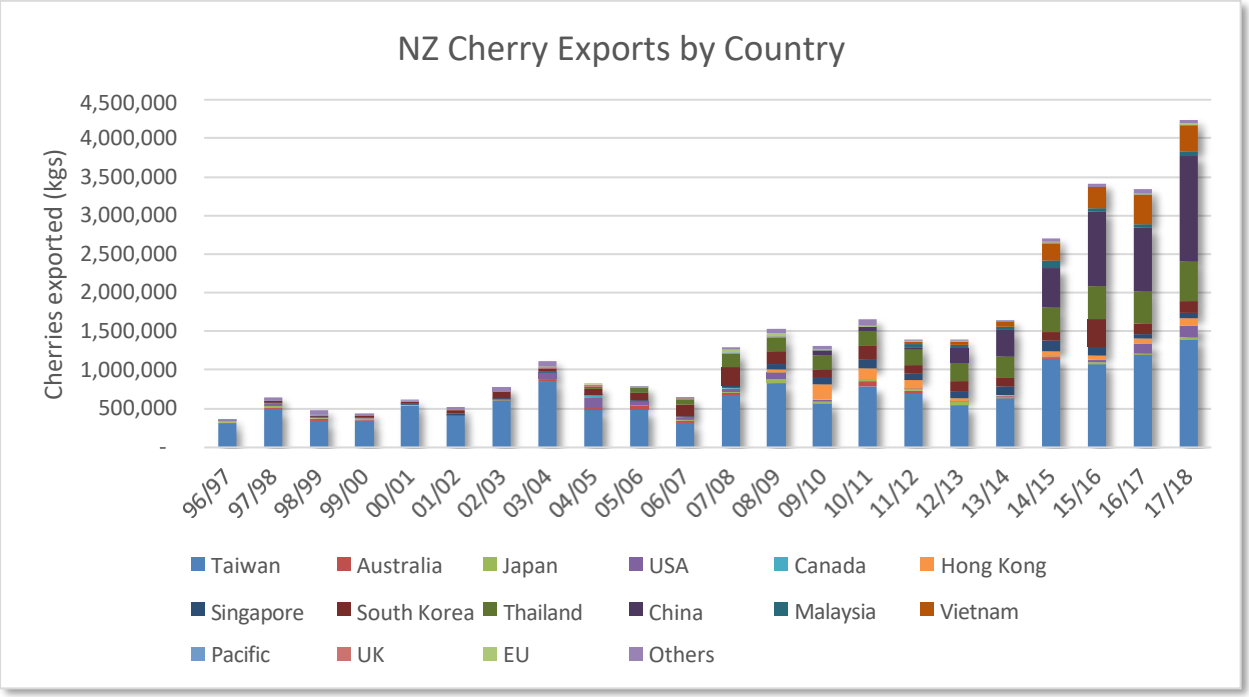


Figure 14: Export volume by country of NZ's cherry export markets. (SummerfruitNZ, 2017/2018)

Fruit size is an important pre-determinant of meeting export standards, other quality parameters notwithstanding. Fruit will need to be a minimum of 26mm to be able to be exported otherwise it will struggle to sell and command satisfactory prices, particularly so in Asian markets. Prices increase with an increase in fruit size, a rough guide being that price increases by $5.00/kg for every 2mm increase in fruit size.

NZ has several key competitive advantages in export markets which enables our exporters to achieve above average prices compared to our competitors.

NZ's competitive edge

- Fast into market, within 72 hours
- High export standards – HEA
- Direct Asian transport links
- High quality fruit

The first of these is the HEA standards which regulates exporters. Because of this and the inherent quality of NZ's cherries the standard of fruit being received into the market is best on offer. NZ has relatively close and direct transport links into Asian logistics hubs through air freight so fruit can be in market within 24 – 72 hours of picking, further retaining the quality of the picked fruit to the consumer. NZ's reputation as a country with high food safety standards with produce grown in a clean and natural environment is an overriding advantage.

A consequence of this is that NZ cherries are able to hold a consistent price premium of 50% or more (Coriolis, 2018) over cherries from key competitors, including Chile. With increased production from Chile it becomes increasingly important for NZ to continue to focus on premium and high value cherries.

International Competitors

Supplying contra-season cherries into valuable Northern Hemisphere markets will continue to be NZ's focus and will be the driver of future growth. NZ's key competitors in this context are Chile and Australia.

Chile

Chile has risen, and is continuing to rise, as the major player in the export market as they currently export approximately 100,000 tonnes from around 30,000 planted ha (Wilton, 2017) with growth of 3,000ha per year. By 2020, the export potential is expected to be around 220,000 tonnes. This clearly dwarfs NZ's production capacity and as such it further emphasises that NZ needs to continue to have a premium led strategy.

Chile is a strong competitor not just because of their volume, but also because of a lower cost structure. They are quick adapters of technology and systems to improve efficiency and reduce costs and have a climate that enables a long production season.

The weakness they do have is speed into market. The majority of their cherries are shipped by sea which can mean the fruit can take up to 60 days from picking to market. As the scale of Chile's cherry production increases and during periods of the season when prices are high it could be feasible for Chilean exporters to charter flights direct into market. This will increase fruit quality entering the market and improve their competitiveness.

Perhaps a further weakness of the Chilean export strategy and potentially a threat to NZ is the Chilean reliance on the Chinese market. 82% (Wilton, 2017) of Chile's production volume is exported into China, in comparison to NZ which exports 32% (SummerfruitNZ, 2017/2018) of cherries into the Chinese market. This is a threat to Chile should the Chinese economy weaken and either demand or prices reduce. It is also a threat to NZ, not just for our exposure to China but also if Chile focuses on other markets, the increased volume into these other markets will compete with NZ.

Australia

Australia produces around 16,000 t (Australian Cherry Growers Inc, 2016) of which around 30% are exported. Given the larger domestic population the local Australian market consumes the majority of Australian production. However there are strategic plans in place to increase total production and exports to 18,000 t by 2020/21 (Australian Cherry Growers Inc, 2016) with a continuing focus on Asian markets which they are in close proximity and with good freight connections. The quality of Australian cherries are considered to be very good and in market they achieve prices close to NZ.

Depending on the level of production that Australia achieve will determine how much of a competitor they will be in the future.

Overall there is a growth in the international export market where demand is outstripping supply. China is the primary market where the growth is occurring and all Southern Hemisphere exporters are benefiting from this demand which is described as a 'pull market'. A growth in market along with an increase in consumption will benefit NZ and it seems we are well placed with a diversified export market, focused on having the best quality produce in market and achieving premium prices. As it is possible our competitors will be able to replicate, at least in part, some of our key advantages it will be more critical to develop the NZ brand and safeguard our reputation in the market.

Porter's Five forces model – assessment of industry competitiveness

Figure 15: Porters Five Forces (Dobbs, 2014)

Financial Returns

For the assessment of returns in this business plan my approach is to look at both a conventional orchard development with centre-leader trees planted at 800 trees per ha and a UFO system with 1600 trees per ha. With some actual commercial yields over several years from the UFO system it is reasonable to make accurate assumptions on this system.

The main assumptions are;

- 5ha block of cherries.
- Self-contained with all machinery owned.
- The orchard is self-managed with extra labour sourced as required through the season.
- Land costs have not been included and debt servicing, tax and depreciation have not been considered for this exercise.
- No allowance has been made for the spread of capital costs which would normally be spread over the initial years of development.
- Assumptions made for pricing and yield (Table 8 & 9) are conservative. The UFO system is assumed to come into harvest one year earlier and have an average higheryield.

Table 8: Assumed yields for the different planting systems

Harvest Years and Budgeted Yields		
	Conventional Orchard (kg/ha)	UFO Orchard (kg/ha)
Year 0 (planting)		
Year 1		
Year 2		
Year 3		6,000
Year 4	4,000	8,000
Year 5	6,000	10,000
Year 6	8,000	12,000
Year 7	10,000	12,000

Table 9: Assumed prices and market segments sold into

Market Segments and Average Budget Pricing		
Market Segment	Proportion of fruit sold in each segment	Price per kg FOB ($NZD/kg)
Export	70%	$ 12.00
Local	15%	$ 8.00
Gate	5%	$ 8.00
Wastage	10%	$ -

Capital Costs of establishment

There are clear differences (Table 10) in the capital required to establish a UFO system compared to a conventional orchard. The main differences are the increased number of trees required in the UFO system along with trellising infrastructure such as wires and posts.

Table 10: Capital Cost of developments (source: own calculations)

	Conventional Orchard		UFO Orchard	
	Total ($)	Per ha ($)	Total ($)	Per ha ($)
Development Costs	28,040	5,608	82,368	16,474
Harvesting Equipment	36,800	7,360	36,800	7,360
Infrastructure	515,000	103,000	515,000	103,000
Buildings	40,000	8,000	40,000	8,000
Trees	92,000	18,400	191,705	38,341
Machinery	167,500	33,500	167,500	33,500
Sundry	2,000	400	2,000	400
Contingency	83,000	16,600	95,000	19,000
Total Capital Costs	964,340	192,868	1,130,373	226,075

Operating costs

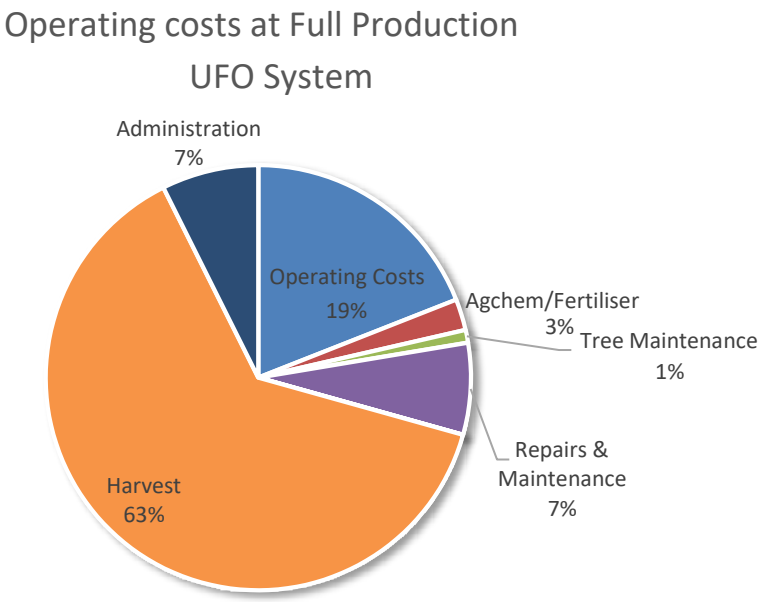


Figure 16: Operating costs of UFO cherry orchard

Operating costs are relatively consistent once full production is reached. Harvest costs, which includes picking, packing and selling expenses are the largest proportion of costs and are directly related to yield. In a poor growing season, financial losses can be reduced through the non- harvesting of poor fruit and in extreme cases not harvesting some areas altogether.

Accumulated Surplus/Deficit

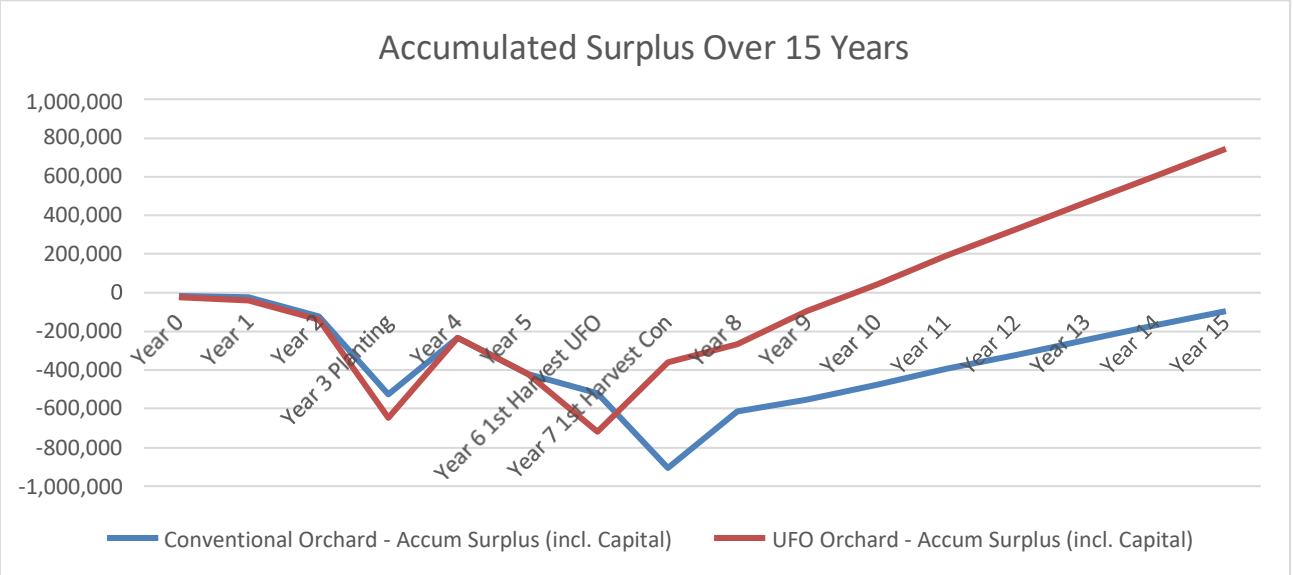


Figure 17: Accumulated surplus/deficit over time between UFO and Conventional systems

The chart (Fig. 17) shows the accumulated surplus or deficit over a 15 year period. This includes capital expenditure. Typical high, upfront capital costs, are required to establish, prepare and plant a new cherry orchard and cash deficits in the initial phase of the investment are normal. The variation between the two systems demonstrates the value of the crop coming into harvest one year earlier (UFO system) and also the value of higher terminal yields (UFO system). This is despite an approximate 20% higher capital cost in the UFO system compared to a conventional planting.

Table 11: Sensitivity analysis. Gross profit per ha before tax, depreciation and amortisation

		Average Price Received ($/kg)						
		$ 9.00	**$ 10.00**	**$ 11.00**	**$ 12.00**	**$ 13.00**	**$ 14.00**	**$ 15.00**
Sold fruit (kg/ha)	**6,000**	- 10,786	- 4,786	1,214	7,214	13,214	19,214	25,214
	8,000	- 2,786	5,214	13,214	21,214	29,214	37,214	45,214
	10,000	5,214	15,214	25,214	35,214	45,214	55,214	65,214
	12,000	13,214	25,214	37,214	49,214	61,214	73,214	85,214
	14,000	21,214	35,214	49,214	63,214	77,214	91,214	105,214
	16,000	29,214	45,214	61,214	77,214	93,214	109,214	125,214
	18,000	37,214	55,214	73,214	91,214	109,214	127,214	145,214
	20,000	45,214	65,214	85,214	105,214	125,214	145,214	165,214

The average price received by growers in 2017/18 season was $15.08/kg (SummerfruitNZ, 2017/2018) which, depending on orchard yield, offers good potential for returns. The sensitivity analysis in Table 11 illustrates the potential of cherries as a relatively high risk crop with high potential returns.

Underlying profitability is good with potential returns, at the top end of prices and yields, exceptional.

Recommendations

The cherry industry is facing a period of rapid and unprecedented growth and opportunities will come for the industry where there can be unity of purpose and sharing of ideas. With much larger producers, who are increasing supply, NZ growers and exporters must continue to work within the premium segment of the market to gain maximum value for their product.

Collaborate to leverage size and market demand

The small size of the NZ industry means we will have greater strength when working collaboratively together. There is currently collaboration through SummerfruitNZ and informal collaboration amongst likeminded growers however further collaboration could be formalised in the following areas;

Production based

- Grower technical discussion groups
- Extension officers supporting growers
- Fewer and larger state-of-the-art pack-houses
- Payment pooling across season and sharing to spread risk

Market focused

- Local in-market support in key export markets
- Co-ordinated branding
- Expansion of European and Nth American markets

Increase demand in the NZ (local) market

With increased supply, whilst most will be intended for exporting, and on occasions when the growing season negatively impacts quality, the likely result is that NZ market prices will be depressed. Peak demand in NZ runs for two weeks before Christmas and then drops quickly. A key benefit to NZ cherry growers would be to spread this demand period out by increasing the consumption of cherries for a longer period over summer. This would need to be carried out through a sustained advertising campaign promoting the health benefits of consuming cherries and making them a genuine 'summer fruit' rather than just a festive focused treat.

NZ based breeding programme

Cherries are one of the few crops in NZ that doesn't have an own NZ breeding programme. Breeding is a long-term investment and returns would not be immediate. However as volumes increase from export competitors such as Australia and Chile then developing opportunities to differentiate ourselves could be crucial. Breeding programmes would be market led focusing on consumer preferences, seasonal spread and agronomic robustness for NZ conditions. Furthermore, collective industry support for the introduction, quarantining and assessment of new root-stocks in NZ conditions.

Increase commodity levy

The current levy, 0.75% of the price received at the first point of sale, should be increased to 1.00%. The increased funding would be targeted towards breeding and research and development.

Conclusions

The NZ cherry industry is a viable and exciting growth industry and worth investing in.

While upfront investment costs are significant the potential returns would justify and require this investment. Some of the most significant costs are directly for risk mitigating infrastructure such as bird nets and wind turbines. While all risks cannot be completely mitigated they can be lessened with careful site selection, orchard planning and attention to detail in orchard management.

It is likely there is an opportunity to reduce upfront costs through sharing machinery with other orchards and using a high proportion of own-labour.

There is confidence in the demand from export markets and this will continue to be strong. Some concern surrounds Chile's rapidly increasing production though the majority of their production period occurs before NZ. NZ's focus will always need to be on premium quality and demanding premium returns. We must not compromise our reputation for quality by exporting sub-standard fruit.

There could be seasonal pressure on the NZ market, especially in seasons when overall fruit quality is poorer. Non-export quality fruit will be sold onto the NZ market depressing prices. In such seasons growers could receive prices in the NZ market below the cost of production.

The expansion of the industry and new entrants into the NZ market will lead to new ideas and thoughts across all aspects of the industry leading to innovation and improvements. The key is for the industry to share these across the sector to improve competitiveness.

While labour is going to be an ongoing challenge the development of the new planting systems such as UFO will assist in the efficient use of the labour force as well as setting up orchards for the future use of automation and robotics whenever such technology become available. These new systems also look very exciting for improving orchard productivity by reducing operational costs and increasing yields. The financial analysis in this report indicates a faster return on investment on the UFO orchard system and when combined with lower operating costs, easier management requirements and higher yields then new cherry orchard developments should consider this system in favour of a conventional orchard investment

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