



Getting Plant Varieties Right

By Shannon Harnett

2020 Nuffield Scholar

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Executive Summary

Covid restrictions meant there would be no international travel to study my topic of choice. Luckily New Zealand is a thriving hub for primary industry innovation. My domestic research has been aimed at gaining a deep understanding of plant variety rights (PVR), value creation, and the changing rules of the game.

There are two high profile super stars in the PVR space that I am particularly interested in - Zespri Sun Gold and the Rockit Apple. I draw examples from each throughout the report.

The owner of a PVR has the exclusive right to propagate and sell the fruit, flower, or other products of the variety under PVR, or the duration of the right. For kiwifruit, this timeline can be up to 20-23 years. The PVR owner can issue licence to third parties to grow and sell the product.

A fundamental clarification is that rights and royalties do not guarantee a successful product. The protection of the Plant Variety Right, the strength of the product and the branding creates value.

The key benefit of having the plant variety right is control. The control to structure supply to meet demand, now and into the future. The licencing of a PVR variety allows supply to be controlled so demand from customers continues to be in excess of supply. Thus enabling the value chain participants of the variety to be rewarded.

Branding and marketing the brand involves significant investment, with returns generated over the medium term. A successful product that has PVR and IP protection has the funding available to spend on continued marketing and branding, without the threat of competitors undercutting and driving down revenue.

Premium commodity product attributes are easily replicated. The cost of commodity innovation and research and development not protected under intellectual property law, are worn by the first mover. The advantage is held by the fast followers.

The incorporation of sustainable Development Goals into policy and corporate values are positively driving change. They are an environmental and social guideline for governments and businesses. On a producer level the financial implications of not changing will be far reaching, from the availability of money to the availability of markets. As New Zealand producers embrace these goals, we should see a corresponding increase in demand for our exports. Environmental and social considerations are now within the rules of the game. Environmental legislation is a complex, fast-moving area with potential for unintended consequences.

Supermarkets dominate food supply, holding an unequal share in the balance of power. As such, they have the potential to drive change for a more sustainable future. As the conduit to the consumer, supermarkets could easily demand sustainable production methods.

New Zealand is currently updating the Plant Variety Rights Act 1987 to bring its standards in line with The International Union for the Protection of New Varieties of Plants (UPOV) 1991 update. It is expected that it will give PVR holders further clarification and ability under the legislation to protect their rights. As per the requirements of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP).

The CPTPP will open up markets for New Zealand exports to 480 million people and result in an estimated \$222 million per year of tariff reductions. We will see the beneficial effect over the next 10 – 15 years as trade restrictions are reduced. This benefits all exports – aquiculture, forestry, horticulture including wine exports, dairy, and sheep and beef. The partnership also lowers the cost and time spent getting products into international markets with less boarder bureaucracy.

This update to the legislation is an opportunity for New Zealand to become a world leader in PVR legislation. To have fit-for-purpose legislation that incentivises the development of new varieties, and the importation of existing international varieties would create a competitive advantage. We can be world leaders in plant variety innovation, and research and development. Backed up by robust legislation that protects the IP that is created, ensuring the ability to take quick, cost effective and assertive action over infringements.

The tension between science-led and consumer-led research and development is unavoidable. There is a need for both. Successful consumer-led innovation directly produces economic value. Science for the sake of obtaining knowledge leads indirectly to economic, social, and environmental benefits.

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Acknowledgement

The opportunity to become a Nuffield Scholar is one I am grateful for. To be able to step outside of my business and gain insight into the New Zealand primary industry on multiple levels has been rewarding. I thank the Trust and the Strategic Partners for this opportunity.

If New Zealand is to thrive, we need leaders who continue to ask the hard questions, challenge the status quo, and foster collaboration. Nuffield's investing partners are all instrumental in making it possible for scholars to grow our understanding and develop into future leaders.

The time spent with the other scholars was a highlight. The inability to travel overseas paved the way for a collaboration of the 2020 scholars and shared experiences with the 2021 scholars. I thank my Nuffield cohort for sharing this journey with me.

Thank you to all the people I met with. I appreciate you candidly sharing your thoughts, insights, and wisdom with me.

I thank the team at Rural Accountants for their support and encouragement and really stepping in to fill the gap while I was away.

To Shane, Georgia and Anna, Christine and Ian, thank you for your patience and interest in my Nuffield journey.

Who I Am

I live on a kiwifruit orchard just out of Opotiki in the Eastern Bay of Plenty with my partner Shane and children, Georgia 17, and Anna 9. I'm a Chartered Accountant, and director and co-owner of Rural Accountants, an accounting firm in Whakatane. I am a Chartered Member of the Institute of Directors and have a Post Graduate Diploma in Agri Commerce.

I Chair 4 horticulture entities being two Rockit apple orchards, an organic kiwifruit orchard and a 700-cow dairy farm with approximately 100 hectares that is being developed into kiwifruit and avocados. I am a director of a large horticulture orchard development and management company, and a director of a family-owned rural investment company that owns two kiwifruit orchards and multiple horticulture investments. I am the co-owner and director of a concrete business that produced over 20,000 m³ of concrete in the 2021 year and is on track to do the same in 2022.

Approach

This research project is based on insights gained from discussions with industry players and leaders. It is qualitative in nature. In undertaking this research, I have travelled New Zealand listening and talking to growers, business owners, directors, and people on the ground. Many of the conversations that I have had have been confidential in nature, I have been cognisant of privacy. I have paraphrased where possible and have not attributed particular views to individuals. This is a document of my observations, research to underpin these observations, and supported by examples where appropriate.

My Nuffield Experience

“Nuffield is a process to create insights and foresight”.

Covid was disruptive for a 2020 Nuffield scholar. It would be easy to think of the lost opportunities, the inability to travel, the new friends and acquaintances never met. However, as a group, the five 2020 New Zealand scholars optimistically altered the course and adapted to a domestic Nuffield experience.

For us, COVID-19 has somewhat replicated the degree of disruption, pressure, and uncertainty that a Nuffield Scholarship seeks to create (minus the travel - of course). In 2020 we had over 200 Conversations about the impact of COVID, made more than 20 key observations, and came up with 4 Challenges:

- Proven supply chain resilience
- Growing disparity between have and have nots
- Challenges around fit for purpose leadership
- Adding value by moving from value to values

These challenges hold true as the pandemic continues in to 2022.

The 2021 national field research was carried out over late February and early March 2021. We started at Kaitia in the North and finished up in Invercargill in the South.

The 2020 and 2021 scholars reported five pillars fundamental to a thriving NZ food and fibre sector:

- Incentives
- Innovation
- People
- Silos
- Leadership

This travel, and the experiences gained, gave me the platform on which to base my final report. This was further enhanced by many discussions with industry players and research into my chosen topic.

My Nuffield experience was longer than previous years, stretching two years rather than one, this provided ample time to dwell on the prospect of putting this project together. Since becoming a scholar, I have had conversations with people who are keen to also become scholars. One thing that causes them to hesitate in pursuing the scholarship is the workload and its academic nature. As I complete this project, I say the project is a unique opportunity to put thoughts and opinions into a document through research and much musing. An opportunity to link concepts to human behaviour and our changing world, and to create a body of work. It is not easy, but most things worth doing in life are not easy.

i. PVR's

A quick guide to Plant Variety Rights

Plant Variety Rights (PVRs) are not new. The current New Zealand Plant Variety Rights Act 1987 (PVR ACT) is over 25 years old and is currently being updated. The publicity of PVR success stories such as Envy apples, Zespri kiwifruit and Rockit™ Apple have fuelled interest in plant variety rights. The current review of the PVR Act 1987 is also making headlines.

The owner of a PVR has the exclusive right to propagate and sell the fruit, flower, or other products of the variety under PVR for the duration of the right. For kiwifruit, this timeline can be up to 20-23 years. The PVR owner can issue licence to third parties to grow and sell the product.

What is a PVR?

As at June of 2021 there were 1,289 PVR varieties in NZ ranging from arable farming, pastoral farming, vegetable production, fruit growing, floriculture (flowers), and ornamental industries. New Zealand has robust plant breeding programmes spanning universities, crown research institutes, and private entities (domestically held and international).

For a variety to qualify as a new variety it must show 3 attributes:

1. Distinctness
2. Uniformity
3. Stability

A grant of plant variety rights requires that the variety be new, have an acceptable denomination (variety name) and be morphologically or physiologically distinct from all other varieties, sufficiently uniform and stable through reproduction.

(MBIE, 2022)

A fundamental clarification is that rights and royalties do not guarantee a successful product.

The product must first stand on its own merits. A superior product with attributes on nutritional composition, taste, size, shape, consumer preference, convenience, pest and disease resistance, harvest timing, storage ability and travel durability is needed to pass the commercial viability test.

The International Convention for the Protection of New Varieties of Plants (UPOV)—established in 1961—is the principal international agreement that underpins the intellectual property protection over plant varieties. The New Zealand Plant Varieties Act 1987 is the current New Zealand legislation around PVR's.

Why does a PVR matter?

Why breed a variety and register it with the New Zealand Intellectual Property Office? The key benefit of having the plant variety right is control. The control to structure supply to meet demand, now and into the future. The licencing of a PVR variety allows supply to be controlled so demand from customers continues to be in excess of supply. Thus enabling the value chain participants of the variety to be rewarded.

This fundamental point of difference makes all the difference. A successful variety and a well-managed PVR doesn't experience the commodity price and supply fluctuations.

NZ PVR update

New Zealand is currently working through an update of the 1987 Act to bring its standards in line with the 1991 UPOV update. It is expected that it will give PVR holders further clarification and ability under the legislation to protect their rights. As per the requirements of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), New Zealand should have implemented these changes by December 2021. However, the legislation is currently sitting at the second reading stage and there are some meaty issues that need to be handled with care and consideration – more on that further in the report.

This update to the legislation is an opportunity for New Zealand to become a world leader in PVR legislation. To have fit-for-purpose legislation that incentivises the development of new varieties and the importation of existing international varieties would create competitive advantage. We can be world leaders in plant variety innovation, and research and development. Backed up by robust legislation that protects the IP, ensuring the ability to take quick, cost effective and assertive action over infringements.

ii. Smart Horticultural Innovation

Strong research and development and innovation is key to bringing new varieties on to the market.

New Zealand has a plethora of resources and research capability. Private enterprise, universities, and Crown Research Institutes (CRI's) are the main providers of science and innovation in New Zealand.

There are seven New Zealand CRI's, listed below with a brief explanation of their purpose. It's easy to see how their research could overlap whilst operating in silos.

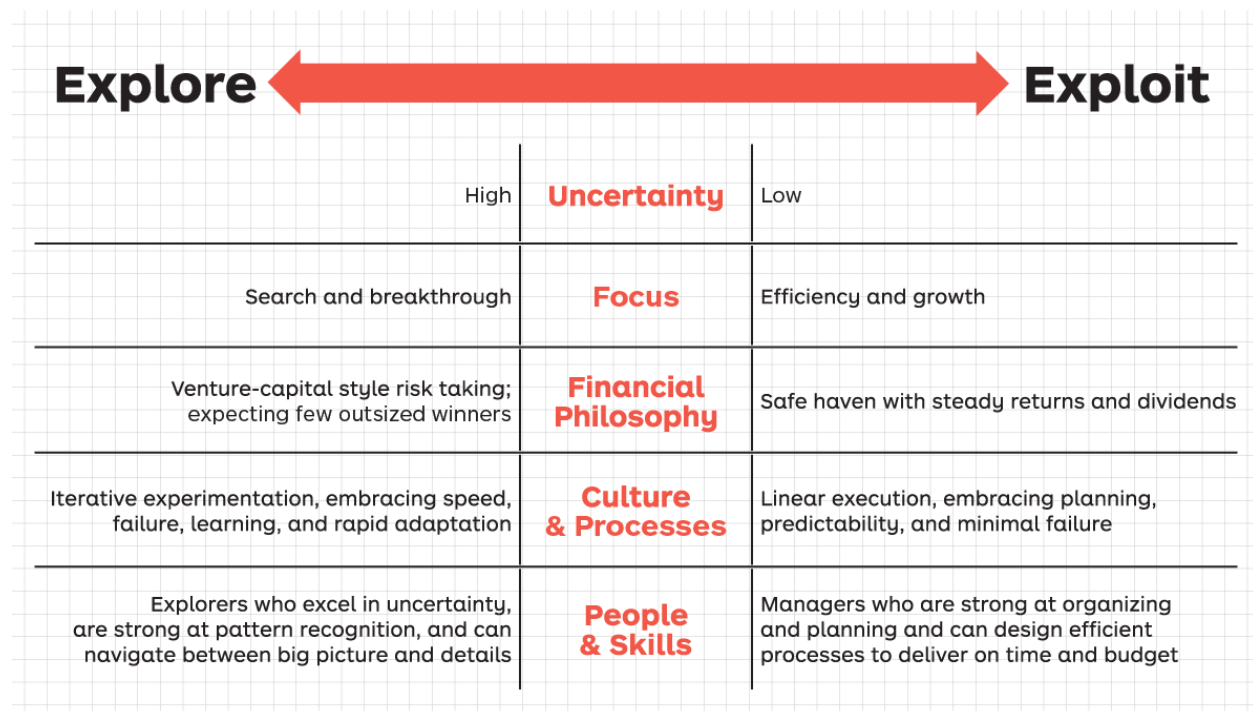
1. Ag Research – Agriculture (agri) based science innovation to enhance the value, productivity and profitability of New Zealand's pastoral, agri food and argi technology sector and value chains
2. Land Care Research – Science for our land and our future
3. GNS Science – to provide earth, geo science and isotope research and consultancy services. Their purpose is to understand natural earth system processes and resources, and to translate these in to economic, environmental and social benefits
4. Niwa – To enhance the economic value and sustainable management of New Zealand's aquatic resources and environment, to provide understanding of climate and the atmosphere and increase resilience to weather and climate hazards to improve safety and well-being of New Zealanders
5. Scion – Specialises in research, science and technology development for the forestry, wood product, wood derived materials, and other biomaterial sectors
6. ESR: Institute of Environmental Science and Research – specialises in science relating to people and communities. Safeguards our health, keep our communities safer, protect our food-based economy, and improve the health of our water and natural environment
7. Plant & Food – Use world leading science to improve the way we grow, fish, harvest and share food. Help deliver health foods from the world's most sustainable systems

An issue with the current CRI structure is that they compete with each other for a finite amount of research funds by attempting to prove that their goal is achievable. However, this competition among silos for finite resources could lead to opportunities to work closer together to create best value for New Zealand. David Epstein's 2019 book "Range" describes silos as 'a system of parallel trenches, in the quest for innovation. Everyone is digging deeper into their own trench and rarely standing up to look into the next trench over, even though the solution to their problem resides there.'

Another consideration is the tension between science led and consumer led research and development is unavoidable. There is a need for both. Successful consumer led innovation directly produces economic value. Science for the sake of obtaining knowledge leads indirectly to economic, social, and environmental benefits.

The reward of economic gains needs to be balanced with the risks to innovation. Capital and new knowledge are required, noting the source of this can impact on the success of the project and the return horizon. There are risks from competition and yet-to-be-proven value chains. Sticking with the status quo is proven and safe ... for now.

There is always a balance between exploiting the gains of the past and exploring the potential future.



(Luo, 2022)

How did Rockit, Smitten, Dazzle and a handful of other apple and pear varieties come to market? Prevar is the commercial arm of Plant and Food, its purpose is to commercialise cultivars bred. Prevar is owned by New Zealand Apple and Pear, Plant and Food Research, and Apple and Pear Australia. Prevar works with Plant and Food Research to breed varieties that have desirable attributes for consumers. This model differs from the direct relationship joint ventures that Plant and Food have with private entities such as T&G and Zespri.

Prevar owns the plant variety rights to the above-mentioned apple and pear varieties and others. They enter into global or territory licence agreements with third parties to purchase and grow the variety, and to market and sell the product. Rockit Global Limited has the global licence for PremA96, better known as Rockit.

Prevar understands the importance of northern hemisphere and southern hemisphere production, to give a 12-month supply line. They sell the licence to grow, sell, and market varieties here and

overseas. The production of New Zealand IP fruit offshore will overtake New Zealand production within the next few years. This will truly create a global community of New Zealand growers.

Revenue streams flow back in to Prevar through licence fees, which enables Prevar and Plant and Food to fund more research. It's a smart model, one that combines a crown research institute with commercial outcomes. The research is driven by Prevar and is consumer led.

Prevar is the only entity that uses this commercialisation model, which leads me to wonder what the opportunities for other horticultural products?

iii. What's in a brand? Why PVR's matter.

Branding is a fundamental aspect to any consumer-facing business strategy. Marketing sits closely beside branding. That first sale to a new consumer is worth gold, the repeat sale signals the strength of the product and the branding identification.

The Plant Variety Right, the strength of the product and the IP creates value.

It's about adding value

Brand IP (Intellectual Property) refers to any and all rights and privileges in trade names, domain names, product names, logo, and designs. I was told that protecting the IP is like playing a game of whack-a-mole, once you defeat an imitator, another one pops up! The funding available to fight IP infringements is usually built into the grower supply agreements, so there is a 'war chest' available available for fighting breeches internationally and domestically, an expensive but necessary process.

As we travelled around New Zealand, we saw many premium commodity products with strong branding and brand stories. Underlying this, we have NZTE and NZ Inc to thank for promoting the New Zealand story, building provenance as part of a brand package.

A NZ Inc initiative resulting from collaboration with the private sector, New Zealand Story works to enhance New Zealand's reputation, beyond natural beauty. It offers a range of resources for exporters, including market research reports and marketing support and materials, and runs the Fernmark Licence Programme, which authenticates a product's connection to New Zealand. (New Zealand Story, 2022)

As the brand becomes more recognisable and sales increase, the bargaining power the supplier has with the retailer increases. The supplier gets more leverage over shelf space and placement. Marketing a consumer product is expensive and the value created needs to be protected.

Like a Rockit

Without its brand, a Rockit™ apple are a small apple named PremA96 found in the supermarket and most likely in bland, bulk packing surrounded by many other bulk apple offerings. The founders' knowledge of branding allowed Rockit to help consumers reimagine apples as a snack food. The tube and IP around the tube, the logo (also under IP protection), the health benefits, and the New Zealand story all play a part.

A recent key tactic used by Rockit saw Black Caps captain Kane Williamson employed as a brand ambassador - someone whose values align with a product and is known and revered by the consumers.

"Establishing a Global Ambassador role for Rockit will, we believe, have a hugely positive impact on our international marketing and brand awareness. Kane is an outstanding example of a New Zealander with drive and determination who has taken on the world – just like Rockit."
(Harvey, 2022)

Marketing techniques like this involve significant investment, with returns generated over the medium term. A successful product that has PVR and IP protection and has the funding available to spend on continued marketing and branding (without the threat of competitors undercutting and driving down revenue) is adding value.

All of the above requires and depends on the price premium for the product being sufficient.

Your consumer must recognise the value and be willing to pay more.

iv. Macro Market Factors: our Consumers, who are they and where are they?

The Awakening Giant:

China is New Zealand's largest trading partner. Two-way trade between New Zealand and China is at \$32 billion. The latest MFAT information shows New Zealand exports \$16.7 billion to China and \$3.4 billion in services to China. The trade surplus is \$11.9 billion in our favour. The Free Trade Agreement was entered into in 2008 and in 2016 an upgrade to the agreement commenced to ensure it is fit for use. Areas such as e-commerce, the environment, and technical barriers to trade are covered. The China market is so big it can hardly be called a single 'market'; it is a combination of many markets, geographically and by tier (based on population).

For New Zealand kiwifruit and apples, China represents a large customer base, with over 1.4 billion citizens and a rising middle class. In 2003, 3% of China's population was middle class, in 2018 it had increased to 50%. The Chinese consumer has evolved in the last 40 years since the "reform and opening policy" of 1978 allowed greater international trade. (Qiu, 2022)

We are seeing more value being placed on attributes other than straight cost. The conscious consumer is someone who has a growing awareness of the provenance of the food they buy and eat. This includes giving a higher priority to environmental impact, social impact, animal welfare, and sustainability when making food choices.

The conscious consumer isn't just looking for monetary value when making a purchase, they are looking for products that align with their values.

The China Sustainability Consumption Research Program – Consumer Awareness and Behaviour Change in Sustainable Consumption survey, as reported by Yan Li in 2022, found that:

- *Chinese consumers have a basic recognition of sustainable consumption. In particular, young people (20-29 years old) display strong intention and willingness, while 30-49 years olds have greater purchasing power for sustainable consumption. The main driving forces for sustainable consumption in China are food safety and health, environmental protection, and reducing overall costs.*
- *Half of Chinese consumers are willing to pay a premium of up to 10% for sustainable products. The actual level of premium, on average, exceeds this level. On the other hand, 10% of consumers have a strong willingness to pay for sustainable products, providing a core group of support for sustainable consumption.*
- *China's market for green products is currently not competitive and is limited to niche consumers. The market potential for organics and certified products can be expanded through increasing knowledge and trust. Sustainable standards and labelling are one of the effective measures, but*

they currently suffer from a lack of consumer awareness and recognition. The government has an important role to play in improving this situation.

(Yan Li, 2022)

Safe and healthy food is key to the Chinese consumer. The Rockit™ Apple, which is currently housed in a recyclable PET plastic tube, makes the product very attractive at the Chinese supermarket, vending machines and convenience stores. The tube isolates the apples from being touched and goes a long way towards preventing handling damage, bruising and exposure to the environment. Along with the added benefit of ticking the consumer trend boxes of snackification, functional nutrition and convenience.

This section of the report has focused on the China consumer, but it is a naïve exporter who solely focuses on this market.

Don't put all our eggs in the China basket.

Many exporters try to keep their exposure to China to around 25% of export sales. There is a tension between getting the highest return possible for growers and spreading risk exposure by selling into many markets. The costs involved of having wider geographic spread are increased and relationships are harder to manage as they increase. But relying too heavily on one market has time and time again shown to be a high-risk strategy. The multi-market strategy needs to be carefully considered and implemented.

Sustainability

The United Nations Sustainable Development Goals (SDG) were created by the UN in 2015 to provide a framework to end poverty, ensure prosperity, and protect the planet. The goals have been adopted by 193 countries in the world.

(United Nations Department of Economic and Social Affairs, 2022)



(United Nations Department of Economic and Social Affairs, 2022)

Currently Finland, Sweden and Denmark rank in the top three in progress towards 100% in all 17 goals, they sit at around 85%. New Zealand is 23rd with 79.13%. Responsible production and consumption is the area of most challenge. Food waste, the 12th sustainable goal being a challenging work in progress.

Research shows that the SDGs are now more relevant in catalysing businesses into action than ever. In 2019, just 25% of respondents described the UN's goals as central to their planning.

Sustainable development goals are also becoming more engrained in financing packages and new financial products are being developed to help support businesses adjust to low-carbon economies. Green and sustainability linked financial products are gaining in popularity and governments around the region are encouraging financial institutions to help facilitate corporates transition to more sustainable business models.

(Baker McKenzie, 2021)

The incorporation of these goals into policy and corporate values are positively driving change. They are an environmental and social guideline for governments and businesses. On a producer level, the financial implications of not changing will be far-reaching, from the availability of money to the availability of markets. As New Zealand producers embrace these goals, we should see a corresponding increase in demand for our exports.

“Do as they pay, not as they say”

Agribusiness exporter on consumer preferences.

Supermarket Power

The supermarkets hold an unequal balance of power, and with that hold the huge potential to drive change for a more sustainable future. The past 18 months have seen sustainability take more of a back seat with single use/disposable items becoming important from a hygiene perspective. However sustainable development remains entrenched in business renewal strategies. The supermarkets are the conduit through to the consumer.

During our 2021 domestic travel we visited the South Island Food Stuffs headquarters and distribution centre. It's easy to see the monetary value they place on social responsibility and sustainability.

The supermarkets have the power to demand sustainable production methods.

Foodstuffs Social Responsibility Report 2021:

Here for NZ is our commitment to supporting New Zealanders where and when they need it, and to safeguarding the future of the environment. It sums up our core purpose and what we stand for as a business.

**Healthy and Affordable**

Food – We support every New Zealander to access healthy and affordable food.

**Sustainability Leadership** –

We are sustainability leaders in our operations and how we source our products.

**Supporting Local Communities** –

We support our local communities to thrive.

**Meaningful Work** –

We create meaningful and safe work for our people.

(Food Stuffs, 2022)

Who wears the cost of the increased administration and audit of sustainable products? Are consumers willing to pay the increase, research suggests they are willing to pay more, but how much more and for how long? How much of that higher retail sales price pass back down the chain to the producer?

The New Zealand Commerce Commission has issued a draft report into the New Zealand grocery sector. As part of the study they looked at a range of things including:

- How retailers deal with their suppliers such as manufacturers, producers, farmers and growers
- Competition at the supplier level of the grocery market
- Who consumers buy groceries from and who supplies those retailers
- Competition between retailers when selling groceries to consumers
- What retailers charge consumers for groceries and how they decide on their prices, as well as the associated levels of service, product ranges and quality of groceries.

In my view, the draft report was damning. It showed the extent to which the New Zealand supermarkets enhanced profit levels. The Internal rate of return (IRR) of over 20% was surpassed only by Norway, Iceland, South Korea, and Switzerland (per the Commerce Commission report). The comparative average of other international supermarkets was an IRR of around 6%. In a properly functioning free market economy, prices are set by competition.

The use of plastic

It's important to understand the markets we sell into, as well as consumer values and behaviour. Wherever that consumer is, their values must be considered alongside the businesses' core values (BCV). BCV should be the primary drive for decision-making. The personal values prioritised differ across cultures. This puts businesses attempting to appeal to international markets in a difficult position. BCV need to be rooted in science and best-known practices — as supported by facts — to protect businesses from appealing to external consumer desires based on unscientific rhetoric that may emerge in the cultural fads. They must attempt to balance these varying values with their own science-based values as they integrate them into their branding and actions around the world.

One example of differing international consumer values can be seen in The Rockit™ Apple recyclable PET plastic tube: it is not so popular in New Zealand, where consumers are concerned about the unnecessary use of plastic. In contrast, to consumers in China the perceived food safety risk of unpackaged produce outweighs concerns about plastics. This is because the Rockit™ recyclable PET plastic tube is a modified atmosphere which keeps the apples fresher for longer, reducing food waste as well as potential points of contact with the fruit in the supply chain and on supermarket shelves. The plastic wrapped cucumber is in a similar position; it will last 10 to 14 days longer than an unwrapped cucumber and decrease the growth of bacteria on the product.

The issue of plastic use is complex. Failing to account for the unintended consequences of trying to do right environmentally, may lead to other environmental damages. The UN SDG of Sustainable production and consumption highlights the big issue of food waste. FAO estimates one third of all food produced globally is lost or wasted. This equates to c.10% of all greenhouse gases coming from food that is produced but not eaten. The cost has been estimated to be close to \$940 billion annually. Produced but uneaten food represents close to 30 percent of the world's agricultural land area, almost 1.4 billion hectares.

Research and development in bioplastics such as polylactic acid (PLA) and cellulose are starting to become commercially viable. PLA is made from corn or sugar starch and mimics the use of plastic without the associated environmental damage. While this sounds promising, we need to assess the environmental, and health and safety factors surrounding alternatively sourced plastics, and adequate safety standards must be adhered to.

v. The Legislation: a new broom

Plant Variety Rights Bill

The Plant Variety Rights Bill will repeal and replace the Plant Variety Rights Act 1987, the current New Zealand legislation that encompassed the intellectual property rights granted to breeders of new varieties in New Zealand. The new bill aims to do three things:

1. Give effect to Crown obligations under the CPTPP
2. Give effect to Crown obligations under the Treaty of Waitangi
3. Modernise the PVR regime

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a free trade agreement involving 11 countries in the Asia-Pacific region, including New Zealand, Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, Peru, Singapore, and Vietnam Nam. It is called progressive because it goes beyond reducing costs for businesses. It includes commitments to safeguard high labour and environmental standards across the Asia-Pacific region; it preserves New Zealand's right to make laws to protect our people and our environment; it upholds the Treaty of Waitangi; and it will create jobs that will help generate a better standard of living for New Zealanders.

(New Zealand Foreign Affairs & Trade, 2022)

The CPTPP will open up markets for New Zealand exports to 480 million people and result in an estimated \$222 million per year of tariff reductions. We will see the beneficial impact over the next 10 – 15 years as trade restrictions are reduced as per this agreement. This benefits all exports – aquiculture, forestry, horticulture including wine exports, dairy, and sheep and beef. The partnership also lowers the cost and time spent getting products into international markets with less border bureaucracy.

Wai262 is a Waitangi Tribunal claim relating to the recognition of rights around, and control of, traditional Maori knowledge, customs, and relationships with the natural environment. More specifically it relates to who is entitled to make or participate in decisions affecting native flora and fauna. The claim was lodged in 1991, and was given its name for being the 262nd claim lodged in the Waitangi Tribunal. The claim has been possibly the biggest and most complex claim in the Waitangi Tribunal history. It focuses on existing laws policies and practises instead of historical actions. 20 years since the claim was filed, the government is now discussing these long outstanding issues. The review of the PVR Act 1987 is one of the first pieces of legislation that will incorporate the Wai262 claim.

Modernising the legislation will give PVR holders more confidence to invest in innovation and research and development. Creating a more robust system creates more confidence in the system and investment follows.

An area that the legislation will need to address is essentially derived varieties. Should protection cover new varieties developed from a PVR protected initial variety? I would suggest it should.

This will become increasingly important as gene editing technology increases. Currently it is illegal for gene editing to be conducted in New Zealand but internationally, it is being used to understand the ways in which plant genes respond to variation. This information is used to fast-track conventional plant breeding processes.

Enforcing PVR's

Enforcement of the contract, underpinned by the legislation, is a key factor in keeping control of the propagation of the variety held under the plant variety right.

A well set up PVR has licence agreements with growers covering propagation, growing area, quality parameters, packing, and selling.

Most infringements are unauthorised plantings or over-plantings of PVR varieties. Auditing the propagation and growing of PVR varieties is time consuming and expensive. This is done by confirming growing area by GPS mapping and onsite inspections. Sources of information about illegal activity also comes via word of mouth. Internationally, these are to be quickly followed up and acted on, as time is on the side of the offender.

A PVR owner that does not have the resources to actively monitor and discourage infringements will find the value of the PVR being lost.

There are three prongs to the enforcement of PVR's. The first being legal - the utilisation of the legislation. The second is political—to lean on trade agreements and diplomatic relationships to achieve the desired outcome. The third is to partner with the offending party to manage future crops. To ensure as much as possible that the crops are up to quality standard, and it doesn't impact on the reputation of the PVR owner.

Trade Agreements

New Zealand is a minnow on the world stage. In saying that, we overrepresent our size in export trade. We are one of very few countries that practice free trade so comprehensively due to agricultural products being the engine room of our economy.

We are the biggest dairy exporter globally, also the biggest lamb exporter and the biggest kiwifruit exporter. Our attitude towards global free trade includes lack of tariffs, subsidies, and other trade barriers. We are a vocal proponent of the free trade philosophy. This increases our attractiveness and aids in navigating and securing free trade agreements that are both beneficial to New Zealand and the other party/country.

Our primary industry players sink or swim based on overseas demand and the associated profit. Many other countries treat their primary producers differently, subsidising production and imposing tariffs on imports to protect them. The playing field is not level. Our trade agreements are fundamental to the ongoing success of our primary industry.

Our ability to defend against IP (brand) and PVR incursions in overseas jurisdictions are aligned with and sometimes included in our trade agreements. Our ability to defend against breaches requires the offending parties' Government and legal system to uphold IP and PVR legislation in their own country. Historical breaches would suggest it is resource consuming and can be difficult to get ideal outcomes in this space.

Climate change and social regulation based on the UN Sustainable Development Goals (SDG) are now being written into our trade agreements. Acknowledging the global effort that is required by all of us to meet our obligations under the UN SDG is key to our ongoing international relations. Achieving the targets New Zealand has agreed to will be vital. We cannot afford to be laggards.

vi. PVR v commodity – the attraction of PVR's

The New Zealand dairy, forestry, wool, and meat sectors predominantly sit in the commodity space. We can add value around the edges, such as provenance, superior ingredients, positive environmental factors, branding and marketing, technological advances. However, by in large, products will leave our shores as a commodity.

Research suggests that retail customers will pay more at the supermarket for premium products but that increase in value doesn't necessarily come back to the producer in a substantive form. Furthermore, the producer/grower wears the costs associated with developing the added value.

To use beef as an example, a premium cut can be developed in New Zealand with a point of difference that a consumer values and will pay a premium for. However, the more successful the product is in the market, the more likely it is that competing beef companies in the market will copy the innovation, with very little unique distinction at the consumer level. Nothing stops our competitors copying commodity innovation.

Premium commodity product attributes are easily replicated.

The cost of commodity innovation, research and development that is not protected under intellectual property law are worn by the first mover. The advantage is held by the fast followers.

vii. Business Structures

“Co-op v company is a red herring; high performance is key”

Agribusiness leader

During my Nuffield research I visited businesses of many types of structures. Iwi holding entities, generational family businesses, co-operatives, companies with employee shareholdings, companies with community-based shareholdings, and commercial arms of crown entities. The over whelming evidence is that the structure must suit the business. Identification and appreciation of the stake holders to enable success is key, whatever success looks like for that business.

In 1970, Milton Friedman argued in the New York times that:

"there is one and only one social responsibility of business-to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud."

(Friedman, 1970)

Environmental and social considerations are now within the rules of the game.

The syndication model

The increase in popularity of syndicates in the horticulture and, more specifically, the limited partnership model has been fuelled by high returns and increasing underlying asset values. The investments options are broad, given the investor can meet the FMA restriction of being an eligible/wholesale investor. This legislation was brought in in 2011 after several finance companies in New Zealand failed in and around 2008, to protect retail investors from investing in assets that they had little understanding of. There is criticism in the market that this has caused a two-tier investment system, where those who are wealthy have access to high performing investments. Some suggest that the unintended consequences of protecting retail investors reduces their exposure to what are potentially high yield investments.

Syndicates tend to have financial depth due to a large shareholder pool and the FMA restrictions meaning only the wealthy or experienced can partake. This increases the ability for syndicates to invest into modern orchard systems and weather the storm when things go wrong such, as a short-term trade hiccup or adverse weather event. A major issue is that kiwifruit and pip fruit harvests are completed annually and there are critical times through the season during which there is increased risk to production. One hailstorm or a spell of bad weather at an inopportune time can significantly impact the harvest, as opposed to dairy farming, where the milk harvest happens c.250 days a year.

Like all other investments, orchard syndicates need suitably qualified, experienced, and motivated people on the ground.

A horticulture industry leader gave us some very sage advice around innovation and investing. To paraphrase: Only invest what you are prepared to lose. Diversification (asset class/geographic etc) leads to better return on averages over time and these averages rule, it smooths out the risk. Ring fence so losses are mitigated when things go wrong. When taking risks, prepare to get some blood noses, but make sure you don't lose your shirt. We are currently in a weird wild space where all primary products are doing well.

Getting enough workers on to the orchards at critical times has been a struggle and, in some cases, fruit has been left to rot on the ground. The supply chain, lack of critical materials, and the cost of materials are increasing significantly. The growing cost of running a Sungold kiwifruit orchard was approximately \$36,000 (per hectare) three years ago now it's around \$50,000, due to increased wages, fertiliser, fuel and material costs. Apple orchards are facing the same increase in growing costs. This places significant financial pressure on farmers, we will see horticulturalists in the commodity space looking to either replace crops or selling land, realising and repurposing capital.

Increased costs increase the focus on cost control, innovation and at worst pushes the low profit players out.

viii. Land priced to perfection? The capitalisation of non-physical attributes into land values.

Best and highest use of land is in a state of constant change. The drivers and barriers need to be well considered.

Agfirst – Analysis of Drivers and barriers to Land Use Change (2017) list the wide range of factors that can act as both drivers and barriers to land use change, grouped as follows:

1. Biophysical:
 - Soil type and soil characteristics
 - Topography, particularly slope
 - Climate
 - Water – availability for irrigation, impact of land use system on water quality
2. Economic:
 - Relative profitability of the land use
3. Access to capital:
 - Infrastructure
 - Markets
 - Access to information
 - Access to skilled labour
 - Land tenure
4. Technological change, which often impacts via improving profitability.
5. Societal pressures and “license to farm”. This is usually manifest in regulations affecting the sector, e.g., around animal welfare, food safety, human welfare, and environmental impacts.
6. Personal factors. This covers the wide range of difference in individuals which may affect their thinking around land use change. It would include aspects such as age, education and experience, family circumstances, attitude to risk, access to capital, access to information, and attitude to change.

(AgFirst, 2017)

Quantitative easing, more money flowing through the economy, and the past downwards pressure on the OCR, have led to historically low interest rates, reducing costs of funds and therefore prices in many asset classes have skyrocketed. For an investor, the return on successful PVR's or forestry and carbon is substantially more than return on bank deposit or sheep and beef farming etc.

I spoke with famers on the East coast of the North Island who were very concerned that the land use change from sheep and beef farming to forestry is destroying rural communities. This is a threefold issue in that:

1. Lack of land options. It is becoming increasingly untenable for people to buy and farm sheep and beef on hill country land. We are effectively swapping export earnings for carbon credits.
2. Loss of communities. The people required (permanent employment opportunity) to farm forestry is significantly lower than sheep and beef farming and are predominantly transient or out of region.
3. Insufficient appreciation of the long-term effects of large monoculture forests.

Environmental legislation is a complex, fast-moving area with potential unintended consequences.

The increasing price of marginal land suggests investors consider this change is a good thing. So does the vendor. New Zealand's obligations to reduce carbon emissions requires land use change. This is painful to some and beneficial to others. Landowners and investors can be well informed about what the best and highest use of the land is, and the ability to access the resources to implement change, if they want to.

ix. The Zespri case study:

Brief Introduction to Zespri

Zespri Group Limited (Zespri) is a grower owned corporatised co-operative, set up in 1997. Zespri sits under a company structure, pursuant to the Companies Act 1993. The Kiwifruit Industry Restructuring Act 1999 and the Kiwifruit Export Regulations 1999/1991 set the industry structure. The Act and the Regulations established Zespri as the primary exporter of New Zealand grown kiwifruit to all countries other than Australia (and the New Zealand domestic market). Zespri is a single desk seller due to the Act and Regulations.

Shareholders are current and former growers. Shareholders, through the Board, can put restrictions on who holds shares. Zespri is in the process of aligning shareholdings more closely to production, in a way that gives retired growers a timeline to sell down shares and removal of dividend payments.

Before the Act and Regulations were implemented, New Zealand kiwifruit growers had issues that other commodities face—competition between suppliers drove down prices. The 1980's was a particularly turbulent time for New Zealand kiwifruit growers.

Zespri is effectively a monopoly buyer of New Zealand grown kiwifruit. With that, comes the benefits of setting high quality fruit standards, developing markets, and investing in research and development. The rules protecting growers are:

1. Zespri cannot discriminate between New Zealand suppliers, except on commercial grounds
2. Non- Diversification rule. Producers need to agree on any non-core business activity. (Core business is export, marketing, research and development of kiwifruit)
3. Zespri needs to publicly disclose the financial statements

The success of Zespri is linked to the government regulated single desk seller advantage and to the PVRs held.

What PVRs mean to Zespri

Zespri invests significantly in plant breeding programmes that focus on developing new varieties. To progress through the pipeline, a variety needs to meet several product attribute thresholds. Trial fruits are tested for nutritional composition, size, shape, pest and disease resistance, harvest timing, and storage ability. If a variety reaches these targets, Zespri will then consider commercial trials and if a variety meets all the criteria and it is superior to existing varieties, it will consider commercialisation of the variety.

Zespri and Plant and Food entered in to a 50/50 joint venture in 2021, taking the relationship to the next level by creating The Kiwifruit Breeding Centre. This is a fantastic example of private enterprise working with a Crown Research Institute to undertake consumer-led science leading to positive outcomes for both parties. Both will share in the royalties of future commercialised varieties. Not

only does the centre specialise in new varieties but also growing techniques. I visited one of the sites and spoke with passionate horticulturists and scientists about their impressive research.

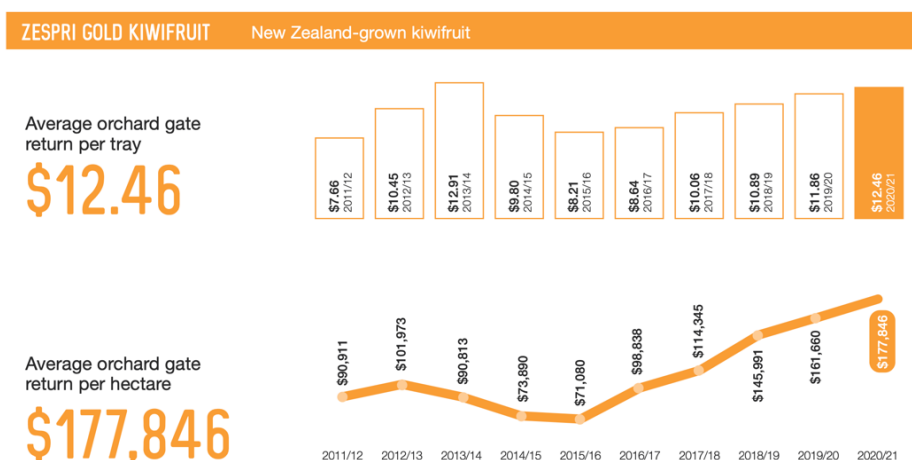
Zespri current kiwifruit varieties in commercial production at present are Sungold—both conventional and organic—and RubyRed. Some Sweet Green (G14) is still in production, but no further licence will be sold. Zespri Green, otherwise known as Hayward is not held under a PVR.

All New Zealand kiwifruit growers that grow a Zespri PVR protected kiwifruit variety must hold licence issued by Zespri. To control supply and maintain demand at a premium price, Zespri releases a certain amount of licence each year. This decision is made by the Zespri Board and considers factors such as demand and supply predictions into the future. In 2021 Zespri released 700 ha of SunGold licence, 50 Ha of Organic Sungold and 350 ha of Zespri Red. In 2022 there was no release of Organic Sun Gold, the release of Sun Gold dropped to 350 ha, and Red at 350 ha.

The revenue for Zespri is driven by royalties, sales commission, and licence sales. The net equity of Zespri has jumped from \$109.5 million in the year end 2015 to \$307.2 million at year end 2021. The Zespri shareholders have seen the share price increased from \$1.09 in the 2014/15 year to \$9.70 in the 2020/21 year.

The growers of Sungold are also tracking very well. The price received per tray has increased by 63% since Sungold was first released in 2011. The production per hectare has improved as growers learn to manage the crop for more production, with the average trays per hectare increasing over 25% since the release of Sungold licence. The underlying land asset, with Sungold licence attached has increased from an average of \$100k/ha during the height of PSa to over \$1,500k/ha for high quality land. Yes, you read that correctly! Over \$1,500,000 per hectare for a Gold kiwifruit orchard in production, and rising.

The results to the New Zealand grower in the 2020/21 season are below. This is the orchard gate return prices, which is the gross return to the grower. It does not account for the on orchard growing, harvest, administration, interest, depreciation and tax obligations of the grower.



(Zespri, 2022)

Zespri Green which is not a PVR variety had an orchard gate return of \$7.51/tray, \$76,722/ha in the 2020/2021 season. When adding back increasing harvest and growing costs, it's evident that the green growers are facing similar issues to other commodity producers.

How Zespri uses PVRs in NZ

Growers that wish to secure a licence must apply through a tender process, which typically takes place in April each year. Licence allocation is then awarded purely based on price. Once awarded, the grower holds the licence through to expiry of the PVR. In the case of Sun Gold, the PVR enabling exclusive supply is in place through to 2039, while for Zespri Red the PVR runs through to 2043.

In the last four years, the median successful tender price for Sun Gold has been steadily increasing to levels that are impressive. In 2016 the median tender price was \$200k per hectare, and in 2021 the median price was \$550k/ha (ex GST). The tenders have been oversubscribed every year.

This reflects the ongoing confidence in the New Zealand kiwifruit sector and the strength of the variety. It will be interesting to see when the market feels the licence is priced to perfection. Ruby Red was \$75k/ha last year and I expect it will increase again this year. Organic G3 was \$305k last year and no licence will be tendered this year.

How Zespri gets 12-month supply

Zespri's largest overseas production markets are Italy and France. As they are both in the northern hemisphere it enables Zespri to maintain a 12-month supply. Providing consistency in supply ensures shelf space and brand presence in key markets. Supplying during the New Zealand off-season means little competition with New Zealand grown kiwifruit and enhances the returns received for all kiwifruit supplied under the Zespri brand.

Zespri's Challenges

Zespri identifies the challenges as

- Rapidly changing regulations in New Zealand and markets globally, particularly around packaging and water
- Biosecurity issues
- The geopolitical environment:
 - opposition to free trade grows
 - trade concerns are increasingly tied up with foreign policy
 - competition for geostrategic influence increases

Zespri have said exporters are having to be increasingly cognisant of the possible impact of this uncertainty on their businesses and to adapt accordingly.

2020/21 saw the ongoing focus on the unauthorised Gold3 plantings in China, with the plantings spreading to an estimated 5,400 hectares by March.

The industry voted on a proposed trial put forward to enable us to understand the problem better and explore a commercial solution. While 70.5 percent of growers supported the proposal to carry out an orchard monitoring trial and 64.5 percent supported the limited sales and marketing trial, the 75 percent threshold was not reached. Instead, our core business activities will progress in China, including further R&D as well as engaging in China as we consider our next steps.

Zespri appears to be using the steps of a three-pronged approach to the unauthorised plantings of G3:

1. Legislation
2. Political
3. Commercial

Zespri's Sustainability Priorities

Zespri has put sustainability at the heart of its purpose to help growers, communities, the environment, and consumers thrive. The priorities below comprehensively cover environmental and social issues that are now, to paraphrase Freidman "within the rules of the game".



In Conclusion

With this report, I hope the reader has gained a wider understanding of the benefits that the PVR system brings to the horticulture industry. And an appreciation that the rules of the game are changing, bringing more focus to social and environmental factors. These factors have historically been externalities, but they are now coming at a cost worn by the value chain players. It is vital that our food production systems can absorb the increased financial burden of the much needed environmental and social outcomes. High value products are the obvious solution - that is easier said than done. The protection that PVRs provide a successful product is a way to overcome the financial challenges. This requires leaning into New Zealand's established innovation and research and development capabilities coupled with our international relationships both legislative and trade. To put PVR's into perspective, they currently account for under 10% of our export earnings. I leave you with this question-what opportunities we can create for New Zealand using the PVR system?

Bibliography

- AgFirst. (2017). *Analysis of Drivers and barriers to Land Use Change* . Wellington: MPI.
- Aon Hewitt. (2015). *Modle of Employee Engagement*. Aon.
- Baker McKenzie. (2021). *From Strategy to Action - Advancing ESG in Asia Pacific*. Sydney: Baker McKenzie.
- Epstein, D. (2019). *Range, How Generalists Triumph in a Specialized World* . London: Macmillian.
- Food Stuff. (2022, February 15). *Looking After Our Patch*. Retrieved from Food Stuff: <https://www.foodstuffs.co.nz/here-for-nz/sustainability>
- Friedman, M. (1970). *The Social Responsibility of Business is to Increase its Profits* . New York: The New York Times .
- Harvey, D. (2022, January 21). *The Profit, Inspireing Business in Hawkes Bay*. Retrieved from The Profit: <https://www.theprofit.co.nz/kane-williamson-blasts-rockit-apples-into-major-marketing-push/>
- Lisa Zimmermann, A. D. (2022, February 07). *Are bioplastics and plant-based materials safer than conventional plastics? In vitro toxicity and chemical composition*. Retrieved from Researchgate: https://www.researchgate.net/publication/344326488_Are_bioplastics_and_plant-based_materials_safer_than_conventional_plastics_In_vitro_toxicity_and_chemical_composition
- Luo, L. (2022, January 15). *Innovation Management: Juggling between the future and the present* . Retrieved from Strategyzer: <https://www.strategyzer.com/blog/the-explore-and-exploit-continuum>
- MBIE. (2022, January 20). *Ministry of Business, Innovation and Employment*. Retrieved from <https://www.mbie.govt.nz>
- Mellentin, J. (2017). *10 Key Trends in Food, Nutrition and Health* . New Nutrition Business.
- Ministry for the Environment . (2017). *Coastal Hazards and Climate Change*. Retrieved from <https://environment.govt.nz/assets/Publications/Files/coastal-hazards-guide-final.pdf>
- New Zealand Foreign Affairs & Trade. (2022, January 21). *Comprehensive and Progressive Agreement for Trans-Pacific partnership* . Retrieved from Mfat.govt: <https://www.mfat.govt.nz/es/trade/free-trade-agreements/free-trade-agreements-in-force/comprehensive-and-progressive-agreement-for-trans-pacific-partnership-cptpp/cptpp-overview/>
- New Zealand Story. (2022, January 28). *NZ Story*. Retrieved from NZ Story: <https://www.nzstory.govt.nz>
- Parsons, J. (2008). *Supply Chain Relationships and Value Chain Design*. Nuffield .
- Qiu, Y. (2022, Febuary 02). *Understanding Chinese Consumers*. Retrieved from China Business Review : <https://www.chinabusinessreview.com/understanding-chinese-consumers/>

United Nations Department of Economic and Social Affairs. (2022, February 21). *Sustainable Development Goals* . Retrieved from <https://sdgs.un.org/goals>

Yan Li, L. Z. (2022, February 15). *China Sustainable Consumption Research Program*. Retrieved from Report on COConsumer Awareness and behaviour Change in Sustainable Consumption :
https://www.oneplanetnetwork.org/sites/default/files/en_report_on_consumer_awareness_and_behavior_change_in_sustainable_consumption_in_china-final.pdf

Zespri. (2022, February 10). *Zespri Annual Reports* . Retrieved from <https://www.zespri.com/en-NZ/annualreports>