October 2021


# Future Focused Land Use Opportunities

**Waimakariri Irrigation Scheme –**
**What does land use look like in 2030, 2050, 2070?**

Leftfield
Innovation
Limited

# Contents

# 1.0 Executive summary

For WIL shareholders, knowing that reliable water is available for irrigation; and that there are viable land use options now and into the future that will not only improve the economic outcomes per hectare, but improve the overall environmental footprint of their farm system is critical to enable shareholders to make the confident decision to support the vote to proceed with Wrights Road Storage Ponds.

It is difficult to determine exactly what the future land use scenarios at 2030, 2050 or even 2070 might be, but what we do know is that the need for reliable water to enable these options is paramount. We do know that it is the market that will continue to influence what farmers produce and raise on their land, namely those consumers that are willing to pay a premium for food and fibre products that meet their expectations and values. They are increasingly concerned about the production impacts farming has on the environment, and for the products they are purchasing, they want to see evidence of where and how the food or fibre product is produced. We are finding that consumers expectations are setting a higher bar in relation to environmental, animal welfare, and ethical issues than that set by regulation.

Licence to operate will be a big part of farming and thus land use choices into the future. Having a vision to help guide what this looks like has been developed by the Primary Sector. The vison, '*Fit for a better world – accelerating our economic potential'* elegantly encapsulates both the need to make sure farming leaves our land and water in a better place for the future, while at the same time creating prosperity for farmers, our regions and country.

Futureproofing your farm and future options to respond to market and environmental requirements and ultimately earn/retain the licence to operate is underpinned by having access to reliable water, and therefore the robust operational package that sits behind the certainty of supply - run of river, stored water, consents to take and use water, and discharge/nitrogen.

In the past, land use studies in response to new and/or more reliable water via irrigation schemes have usually identified areas that can undergo a complete change of land use from one type of farming enterprise to another (e.g., sheep to dairy), which has already occurred in the WIL scheme area. Into the future, land within a farming enterprise needs to be considered for and undergo land use change to the best purpose, and diversifying part of a farm to higher value sustainable use(s) may allow the overall farm system to achieve the environmental and economic outcomes that are desired.

This report demonstrates that reliable water enables farmers to consider diversifying part of their farm to high value land uses to achieve desirable economic and environmental outcomes. The three case studies prepared by The AgriBusiness Group Ltd are sheep milking, covered cropping – blueberries (hydroponic); and pipfruit (apples). These three examples have been selected because they are suited to the WIL scheme area (climate, soils), we have robust existing market data; we have relationships with key businesses interested in expanding from the North Island into Canterbury, and recent business case financials to have a high level of confidence in the on-farm economics results.

| Land use | Minimum area (Ha) | ROI (%) | Investment pay back period |
|---|---|---|---|
| Sheep Milking | 50 | 61 | 4 |
| Covered Crop Blueberries (Hydroponic) | 1 | 38 | 9 |
| Pipfruit - apples | 5 | 17 | 11 |

The economic benefits of diversifying part of a farm provides a compelling vision for the future: -

- 80% Dairy and 20% pipfruit, EBITDA increases by 23%.
- 80% Arable and 20% pipfruit, EBITDA increases by 50%
- 80% Dairy and 20% sheep milk, EBITDA increases by 19%.

(EBITDA = Earnings before interest tax depreciation and amortization are deducted. Put more simply it is the gross revenue minus the total working expenses).

Greenhouse Gas (GHG) emissions is a topic that hasn't been addressed in the WIL modelling to date. However, in the future it will be a particular concern to shareholders given the extent of dairy and dairy support in the region. As an example, diversifying 20% of a farm to high value horticulture (pipfruit) enables a dairy farm to reduce GHG emissions by 25%, and an arable farm to reduce GHG emissions by 24%. There is no doubt that achieving our nations aim of being Carbon Zero by 2050 will require landowners to make significant reductions in the amount of carbon that they emit. Land use diversification within a farm can be used to reduce the GHG emissions of the farm.

The above economic assessment is all based on a commodity product scenario. The next level of benefit is to transition from commodity production to capturing more of the in-market/retail value of the final product. This report provides scenarios of various 'value share business models' that allow farmers to participate beyond the farm gate, away from being commodity 'price takers' to participating within the value chain. This is very exciting but also challenging as new models and partnership will need to be established. Scenarios of between 7.5% margin for provenance, to 50% margin for brand ownership are possibilities.

To demonstrate the impact of the possible range of opportunities we have calculated the EBITDA of the four models used to calculate the impact of the Wrights Road Storage Ponds, plus the three additional models that are included in this report. The table below illustrates that the financial returns improve greatly the more that you move away from the commodity production model.

**Table:- The impact of increased profitability through moving up the value chain ($/ha).**

| | Commodity | Provenance | Specialist | Processing | Brand |
|---|---|---|---|---|---|
| **Margin gained** | **0%** | **7.5%** | **15%** | **25%** | **50%** |
| Sheep Milking | 5,791 | 6,785 | 7,779 | 9,105 | 12,419 |
| Blueberries | 96,575 | 119,075 | 141,575 | | 246,575 |
| Pipfruit | 14,320 | 17,988 | 21,655 | | 38,770 |
| **Dairy** | 5816 | 6755 | 7695 | 8948 | 12079 |
| **Arable** | 2399 | 2759 | 3118 | 3598 | 4797 |
| **Sheep and Beef** | 2330 | 2629 | 2929 | 3329 | 4328 |
| **Dairy Support** | 2691 | 3026 | 3360 | | 4921 |

These value-share scenarios while hypothetical, provide some inspiration for the future that with reliable water backed by storage, there are a range of viable options that with hard work, can be activated for WIL farmers to capture further value back to the farm.

Land use is a tool in the toolbox to improve grower/producers' ability to meet nitrogen and GNG reductions over time. Currently WIL shareholders are achieving impressive N loss reductions. This means that, while N levels on some farms don't directly reduce with the inclusion of a change in landuse, the economic benefits may then enable the reduction of stocking rates to achieve the required N reduction with no loss in revenue and the potential to convert low productive land to conservation plantings with other future benefits.

WIL have the opportunity to, with reliable water through scheme storage, provide a focus on supporting land use and value chain changes that ensure the economic and environmental resilience and prosperity for landowners into the future.

## 2.0 Purpose

The purpose of this report is: To convey the vision that has been agreed for the primary sector, and practical solutions that WIL shareholders could consider as they look to invest in reliable water for their future, and for their future generations.

Ultimately the purpose is to demonstrate that with the confidence of reliable water, sustainable land use options are a 'tool in the toolbox' that enable farmers to deliver products consumers want while meeting regulatory requirements and achieving attractive economic outcomes for the future.

This report will provide 3 high level market informed case studies to illustrate how diversifying land use on part or all of a farm can improve economic returns and environmental performance to meet current and future regulatory requirements.

## 3.0 The Primary Sector Vision

Right now, with the array of pressures facing WIL shareholders, and other farmers across the country, it is difficult to think about vision when so much else takes priority. However, this work has been done by the Primary Sector Council over the past 3 years which has resulted in your Primary Sector agreeing on a vision for its future. It is worthwhile considering what this vision is and what it might mean for WIL shareholders.

The Primary Sector Vision- **Fit for a Better World – Accelerating our Economic Potential**
*'We are committed to meeting the greatest challenge humanity faces: rapidly moving to a low carbon emissions society, restoring the health of our water, reversing the decline in biodiversity and at the same time, feeding our people. We will own our part and lead the change that comes with it, starting now. The principles of Te Taiao define our relationship with nature. Alongside innovative science and technology, we are designing modern regenerative production systems fit for a better world. Within a generation they will be the foundation of our prosperity and the way we produce high-quality, trusted and healthy food, drinks and fibres. These outstanding products will speak of our land, oceans and people. They will be enjoyed by people all over the world, fulfilling their desires for functionality, wellbeing and aesthetics. Te Taiao, and the health and wellbeing of our communities and children for generations to come, will be the benchmark of how we measure success'.*

To support the vision, a roadmap has been designed to achieve, within a decade, ambitious targets for a more productive, sustainable and inclusive economy. Our primary sectors can lead across the three pillars of New Zealand's economic recovery to achieve these ambitious targets:

- **Productivity:** Add $44 billion in export earnings over the next decade via a focus on creating value and building off the strong position of our core sectors.
- **Sustainability:** Play our part in New Zealand's journey to a low emissions economy, by reducing biogenic methane to 24–47 percent below 2017 levels by 2050, including to 10 percent below 2017 levels by 2030, and by restoring New Zealand's freshwater to a healthy state within a generation.
- **Inclusiveness:** Employ 10 percent more Kiwis from all walks of life in the primary sector by 2030 and 10,000 more New Zealanders in the primary sector workforce over the next four years.

While future land use in 2030, 2050, 2070 is unknown, this vision and roadmap focuses on sustainable land uses that produce high value products international consumers want. Having the confidence to look at future land use options for all or part of a farm is underpinned by the need for reliable water.

With constraints on reliability via run-of-river water availability (climate impacts and potential for WIL's ability to access water being reduced with an increase in minimum river flows), having water storage to 'buffer' those

reliability gaps is critical to support sustainable land use options and thus farm viability for the future.

## 4.0 Reliable irrigation/stored water – futureproofing production

Back in the early 2000's MAF (now MPI), advocated the need for water storage to combat the increasing impacts of drought 'the east of New Zealand will be more affected by droughts with the possibility of a 1-in-21year event occurring every three-to-five-years', with 'droughts not restricted just to the summer but could occur in both spring and autumn', and that 'Water will become a scarce resource and water harvesting will be a major industry'. (*Future Food Farming, New Zealand Inc. meeting tomorrow's markets;* Emerson and Rowarth 2009).

Today more than ever, securing reliable water provides an opportunity to re-think land use in the Waimakariri Irrigation Scheme area by taking a holistic look at potential land use in the future and to design farming systems that are diversified and integrate a range of complementary land uses within a parcel of land suited to soil type, water availability, climate, location, and community.

In the past, land use studies in response to new and/or more reliable water via irrigation schemes have usually identified areas that can undergo a complete change of land use from one type of farming enterprise to another (e.g., sheep to dairy), which has already occurred in the WIL scheme area. Into the future, land within a farming enterprise needs to be considered for and undergo land use change to the best purpose, and diversifying part of a farm to higher value sustainable use(s) may allow the overall farm system to achieve the environmental and economic outcomes that are desired.

To make the decision to invest in stored water to improve reliability, WIL farmers need to have the confidence that they are able to increase productivity and generate adequate returns to pay the costs associated with the water. They also need to have a clear vision of what future land use opportunities are available to them that will enable their farming business to plan for the future. Often the benefits of water may not flow to the current landowner, but to the next generation and future generations.

A key message from Leftfield Innovation Ltd's (LFI) engagement with food companies is the importance of reliable water to enable farmers to fulfil their supply contracts. Food companies have indicated they have been reluctant to enter into supply contracts with farmers that don't have the certainty they can produce a crop or finish stock to meet the supply contract timing and specifications. Too often they have been let down by farmers when droughts have occurred. Having access to reliable water provides certainty of production and thus the ability to secure longer term supply contracts.

## 5.0 Market led approach

The Vision to increase productivity requires us to focus on who we are producing food and fibre products for – which are those consumers that care and are willing to pay a premium. Thus, taking a market led approach when considering any land use option is critical. We can produce many products from the land, but question is, do consumes want them? The work involved in identifying and activating land use opportunities that meet a market demand is particularly complex for an individual or business to take on if it is not their core capability as this work involves multiple skill sets – market insights, value chain assessment, business case development, partners to market etc. The challenging nature of this work is often the biggest barrier to farmers looking to diversify parts or all of their farm.

LFI take a market led approach to identify the market potential and what customers want in terms of product function and format and work backwards to determine the processing capability required to transform the raw material that can be sustainably produced in New Zealand into the higher value product and link up growers and processors to partner to produce what the market requires. We undertake this work on behalf of groups of farmers who are looking to develop higher value opportunities to integrate into their existing farm system.

There are many studies and reports that advocate for seeking higher value from the raw materials grown in New Zealand. It is worth briefly looking at how output/ha, value add per tonne across a range of raw materials we already produce in NZ can be transformed into higher value products, and what the emerging product growth categories are, as many of these raw materials could be produced by WIL shareholders.

The Coriolis 2019 Land-use Report shows us that increasing output per hectare and value added per tonne are the two ways in which we will see an increase in both revenue and jobs in the agri sector.

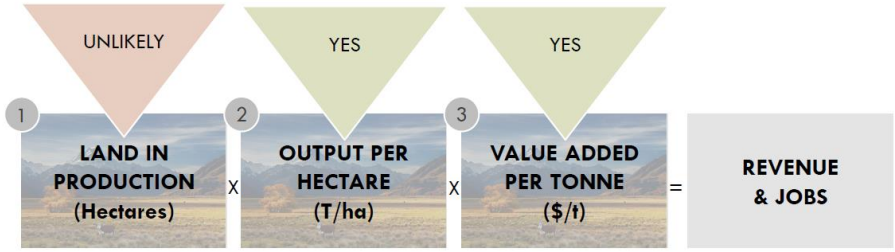


Diagram: Strategies for increasing value from agriculture in New Zealand

Going forward, growth will come from creating more output from less land and selling it as complex products at higher prices (Coriolis 2019 Land-use Report).

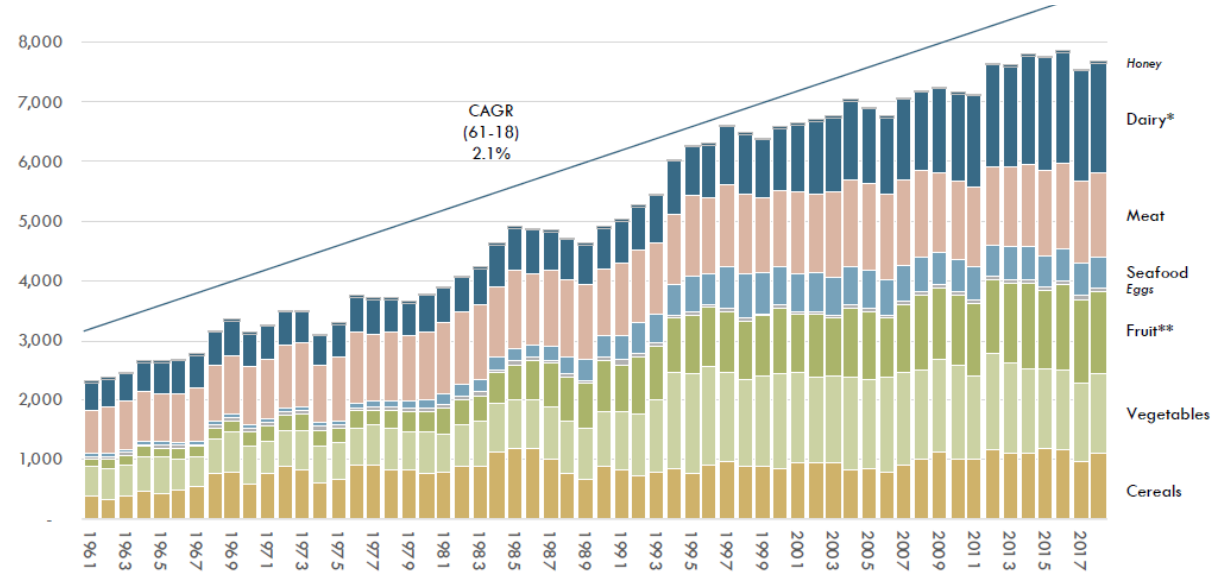


Diagram: Total New Zealand Food Production Volume at Farm Gate - T: 000, 1961-2018; (Coriolis Land use Report 2019)

New Zealand produces large volumes of raw materials which are suitable for making complex, consumer ready products (Coriolis 2019 Land-use Report). The challenge and opportunity are to identify the market opportunities that align with the raw materials we can grow sustainably and the current ability (manufacturing and processing infrastructure) we have to transform them into higher value more complex products that match consumer preferences and demand.

# 6.0 Product complexity

The New Zealand food industry has a clear strategic direction towards greater product complexity (Coriolis 2019 Land-use Report). Transforming our raw materials/commodities is limited to the processing capability that exists in regions across New Zealand.


Diagram: Product Complexity examples – (Coriolis 2019 Land-use Report)

LFI focus on looking at ways to leverage existing manufacturing and processing capabilities in the near term to capture value to raw materials and improve returns, in parallel to building market informed business cases for investment in future value add infrastructure to unlock future food and beverage opportunities for growers across New Zealand.

# 7.0 Capturing value – moving up the value chain

We know that 'what' and 'how' we produce food is becoming increasingly important to meet consumers expectations. However, the economic game changer is the ability for farmers to capture more of the in-market/retail value back to the farm. Below is a high-level assessment of four food products, oat milk, quinoa, tofu sausages and frozen peas. *Food product examples* diagram below illustrates the margins at different points in the value chain as a food is produced from the raw material to demonstrate the price a farmer can realise at the farm gate and the final price paid by consumers. These simple examples are indicative of specific products only and will change depending on the business model, the costs of production and the distribution models used. The examples are intended to illustrate the range of opportunities to increase the value that farmers can capture.

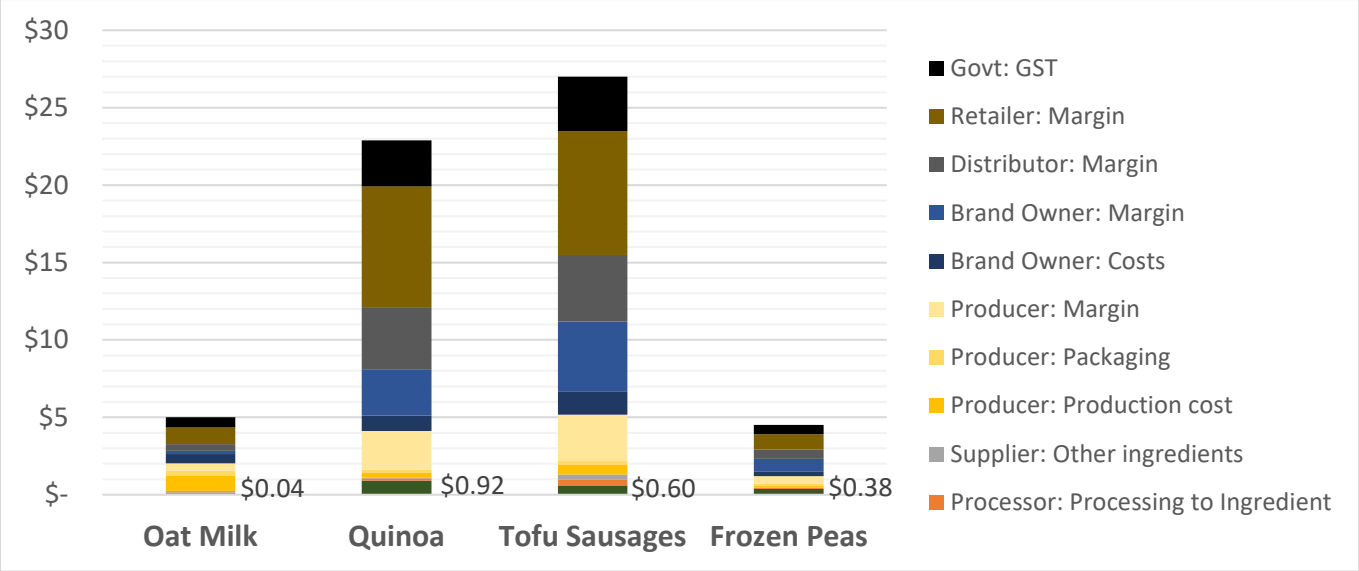


Diagram: Food product examples - value chain per kg at retail

It is clear from the examples that there is increased value realised as products move through the value chain from raw materials to finished products. One of the simple worked examples is the value captured in oat milk production. Farmers producing oats only realise 0.9% of the total value of the final product. While there are unavoidable costs associated with processing, packaging, branding, and distribution there are significant margins for each of these areas as well. The margin for a processor of around 9.4% is 10 times the value the farmer receives for the dressed crop. The retail margin is more than 20 times the value that the farmer receives.

## 8.0 Product category growth opportunities

Numerous product categories have been identified that can contribute to value-add growth for New Zealand, and the Canterbury region. Most of these product categories involve a level of processing to transform the raw material into higher value consumer ready products. Capturing more value back to the farm will require activation of a range of value share business models involving the farmer. For this report, we have selected three case studies to showcase higher value land use options that require reliable water and will enable the farmer to reduce their overall farm system environmental footprint. In Section 9.0, we then overlay a range of value share business models to highlight the potential economic impacts of capturing more of the in-market value back to the farm.

| DAIRY | RED MEAT | POULTRY | SEAFOOD | F&V |
|---|---|---|---|---|
| Advanced/Medical Infant Formula | Meat-Based Snacks | Further Domestic Consumption | Atlantic Salmon | Under Cover/Glasshouse |
| | | | | Root Crops |
| Dairy-Based Nutritionals | Branded, Packaged Consumer Case Ready | Target Key Export Markets | | Processing Vegetables |
| | | | | Nuts |
| Non-Cow Dairy | | Develop Value Added Products | Region Suitable Aquaculture | Apples |
| | Consumer-Ready Convenience Meals | | | Kiwifruit |
| Specialty Cheese | | Alternative Poultry Species | | Avocados |
| | | | | Emerging Fruit |
| **ARABLE/GRAIN** | **OTHER FOODS** | **PROCESSED FOODS** | **WINE** | **OTHER BEVERAGES** |
| High Dairy Baked Products | Honey | Nutraceuticals | Sparkling Wine | Alcoholic Spirits |
| Oat 'Milk' | | Pet Food | 'Cognac' | Water |
| Seeds | Eggs | Confectionery/Snacking | | Cider & Similar |
| Hemp (F&B usage) | | New & Innovative Foods | Non-Marlborough Reds | Premium Non-Alcoholic |

Diagram: Identified product categories that can contribute to growth – Coriolis 2019

# 9.0 Case Studies

The following case studies have been prepared by The AgriBusiness Group Ltd.

The three economic models represented here have been modelled to represent the economic business case for their consideration as a viable alternative to grow along with the other considerations of the market potential and the growing environment that is provided in Canterbury.
The data that has been modelled should be considered as a general indication of their financial costs to grow and the likely returns that can be gained from growing them rather than a specific growing proposition.

All of the economic information which is reported is based on the cost of development alone there is no provision for the cost of the land.

## 9.1 Sheep Milking

### The suitability of Canterbury as a growing environment.

Canterbury is an excellent location for the growing of grass, when supplemented by the addition of irrigation, which is the prime requirement of sheep milking operation.

### The market dynamics.

The sheep miking industry has been in Aotearoa for many decades and is a well proven production alternative but has lacked the development of the processing and marketing of the products which it is possible to produce from it. The recent restrictions on the environmental performance of dairy farming has tended to concentrate attention on sheep milking as an alternative land use as it has a much lower environmental impact on the land.
While the challenges have been taken on by a range of different producers, processors and marketers[1] the scale of their operations does not offer the potential to source sheep milk from a high number of suppliers at present.
It is our opinion, that for the sheep milking industry to expand to any sort of scale in Canterbury, that it would either require the cooperation of one of the bigger dairy processors and marketers that are operating in the market at present or the establishment of the processing and marketing of sheep's milk by a Canterbury operator.

### The Financial model.

The economic model used in this report is based on some previous work carried out by TAG[2] .

The sheep milking model is expressed in two forms in this report one which is converted from a sheep and beef property and one which is converted from a dairy property. They both have the same production and price factors but have different development costs. In this example we have modelled the sheep milking operation at the minimum size of 50 ha. If we were to scale the size of the property up some of the per ha development costs would change considerably from those expressed in **Table 1**.

**Table 1: Sheep Milking development costs ($/ha)**

| | Sheep and Beef | Dairy |
|---|---|---|
| Milking Plant - 12x12 Rapid Exit, | 4,000 | 1,600 |
| Export Vat (second hand) | 400 | 400 |
| Refrigeration Unit | 550 | 550 |

[1] https://mauimilk.co.nz/, https://sheepmilknz.co.nz/, https://springsheepnz.com/,
[2] The AgriBusiness Group 2020: Sheep Milking : Guidelines

| | | |
|---|---|---|
| Effluent Containment & Spreading | 300 | 240 |
| In-shed Feed System | 460 | 460 |
| Lamb Rearing Shed | 1,300 | 1,300 |
| Lamb Rearing Automatic Feeder (per machine) | 420 | 420 |
| Ewes | 3,500 | 3,500 |
| Sheep yards | | 340 |
| Fencing | | 680 |
| **Total** | **10,980** | **9,490** |

The economic measures for sheep milking are shown in **Table 2**.

**Table 2: Sheep milking economic measures**

| | Sheep and Beef | Dairy |
|---|---|---|
| Total revenue ($/ha) | 13,255 | 13,255 |
| Total working expenses ($/ha) | 7,464 | 7,464 |
| EBITDA. ($/ha) | 5,791 | 5,791 |
| Minimum Land Required (ha) | 50 | 50 |
| Time to 100% Yield (years) | 4 | 4 |
| Time to Cash Positive (years) | 1 | 1 |
| Initial Capital Investment ($/ha) | 10,980 | 9,490 |
| Year in which investment is paid back. | Year 4 | Year 4 |
| Net present value. ($/ha) | 53,336 | 54,714 |
| Internal rate of return. (%) | 34% | 38% |
| Return on investment. (%) | 53% | 61% |

## 9.2 Blueberries

### The suitability of Canterbury as a growing environment.

Blueberries have winter chill requirements of anywhere between 200 and 800 winter chill hours depending on cultivar. Blueberries also require at least 600 GDDover 10C between October and April. Both of these climatic requirements are met throughout Canterbury.
Blueberries also prefer consistently high temperatures during the summer, in particular daily maximum temperatures that exceed 18 °C and preferably 19 °C between December and February.

### The market dynamics.

In their report Coriolis[3] identified that there are four broad investment themes that exist for driving export growth in the New Zealand blueberry industry.

1. First, there are opportunities to grow blueberry production.
2. Second, the supply chain can be improved to increase efficiency.
3. Third, the marketing of New Zealand blueberries can be improved.
4. There are opportunities to create value-added products. Blueberries are an extensible platform.

Coriolis were of the opinion that there are continued opportunities for growth in the New Zealand domestic market and in the export markets. In their Executive Summary they state:
*Blueberries are still a young industry, both globally and in New Zealand. To date, New Zealand has achieved success primarily in the domestic market and in Australia, both markets insulated from global pressures by biosecurity. Going forward, the New Zealand blueberry industry needs to transition from this "Walled Garden" into the fast growing, but more competitive markets of East and South East Asia if growth is to continue.*
*The proven success of New Zealand apples and kiwifruit in highly competitive global markets shows what is possible. New Zealand growers have the skills and resources required to make the required transition and continue to grow.*

### The Financial model.

The financial model is one that was created by The AgriBusiness Group to include in the report titled "The Canterbury Berryfruit Report" which was written by Leftfield Innovation. The economic measures for covered Blueberry production are shown in Table 3.

**Table 3: Economic measures for covered Blueberry production in Canterbury**

| | **Blueberries** |
|---|---|
| Total revenue per ha. | 300,000 |
| Total working expenses per ha. | 203,425 |
| EBITDA. | 96,575 |
| Minimum Land Required (ha) | 1 ha |
| Time to 100% Yield (years) | 6 |
| Time to Cash Positive (years) | 6 |
| Initial Capital Investment ($) per Ha. | 310,000 |
| Year in which investment is paid back. | 9 |
| Net present value. | 572,758 |
| Internal rate of return. | 13% |
| Return on investment. | 38% |

[3] Coriolis 2020: Opportunities in the New Zealand blueberry industry. Part of Emerging Growth Opportunities, Food and Beverage Information Project

## 9.3 Pipfruit

### The suitability of Canterbury as a growing environment.

While the average climatic indicators indicate that Canterbury would be suitable for the growing of pipfruit the extremes that are experienced are liable to cause reductions in yields and fruit size. The adoption of fruit that are more attuned to production of smaller fruit such as Rockit and Honeycrisp means that there is potential to take advantage of the Canterbury climate to grow pipfruit as long as the choice of the site is considered carefully.

### The market dynamics.

The market is welcoming the newer apple varieties and strains that exhibit higher colour and have better taste and texture[4]. Increased demand is expected from the Asian markets of China, Vietnam and Japan which are replacing the more traditional European markets.

### The Financial model.

The economic model used in this report is based on some previous work carried out by TAG.

**Table 4: Economic measures for covered Pipfruit production in Canterbury**

| | **Pipfruit** |
|---|---|
| Total revenue per ha. | 48,900 |
| Total working expenses per ha. | 34,580 |
| EBITDA. | 14,320 |
| Minimum Land Required (ha) | 5 ha |
| Time to 100% Yield (years) | 5 |
| Time to Cash Positive (years) | 5 |
| Initial Capital Investment ($) per Ha. | 125,000 |
| Year in which investment is paid back. | 11 |
| Net present value. | 62,150 |
| Internal rate of return. | 8% |
| Return on investment. | 17% |

[4] MPI 2021: situation and Outlook for the Primary Industries.

# 10.0 Best practice business models to capture value

New Zealand's NZ$46.6bn agri-exports have an in-market value of around NZ$260bn thus NZ receives around 18% of the in-market value. This shows us that there is scope to capture more value in New Zealand by transforming the raw materials into higher value products to export to global consumers.

To take a raw material and process it requires time and in many cases some level of scale for a business model to work economically. It is often easier and more cost-effective to work collectively across a farmer group to develop, produce and market a product online. This reduces the reliance and risk of a single farm producing the raw material and spreads the workload associated with running a business. To take the oat milk example, if a farmer group set up their own business and were able to capture the brand, distribution, and retail margin it could potentially capture an additional 38 times the value of the raw oats.

LFI has identified a number of business models that range from the traditional grower/producer model with a contracted supply agreement for raw materials with a food company, through to a grower/producer controlling the entire value chain. Additional value can be captured at the farm gate by growers/producers moving further up the value chain, growing higher value crops or producing raw materials in a sustainable way. This includes providing more information back to consumers about sustainable farming practices and the provenance of the material grown/produced. The model that will generate the best returns depends on a range of factors including what level of involvement and thus risk growers/producers are prepared to take, availability of capital, current and potential land use, and capacity for change.

LFI has grouped the value share business models into four categories. Commodity, having zero value margin over and above the farm gate price, moving to Provenance at 7.5% margin through to brand ownership at 50% margin.

| Scenario | Margin (%) |
|---|---|
| Commodity | 0 |
| Provenance | 7.5 |
| Specialist Production | 15 |
| Processing | 25 |
| Brand Ownership | 50 |

**Table 5:** The margins possible across the scenarios modelled.

## 10.1 Value share impacts.

Previously in this report we have discussed the issue of producers moving further up the value chain by engaging in activities which range from establishing provenance for their product through to brand ownership of their product. To demonstrate the impact of the possible range of opportunities we have calculated the EBITDA[5] of the four models used to calculate the impact of the dam plus the three additional models that are included in this report.
The results of this exercise are shown in Table 6, **Table** where it can be seen that the financial returns improve greatly the more that you move away from the commodity production model.

**Table 6: The impact of increased profitability through moving up the value chain ($/ha).**

| | Commodity | Provenance | Specialist | Processing | Brand |
|---|---|---|---|---|---|
| **Margin gained** | **0%** | **7.5%** | **15%** | **25%** | **50%** |
| Sheep Milking | 5,791 | 6,785 | 7,779 | 9,105 | 12,419 |
| Blueberries | 96,575 | 119,075 | 141,575 | | 246,575 |
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| Dairy | 5816 | 6755 | 7695 | 8948 | 12079 |
| Arable | 2399 | 2759 | 3118 | 3598 | 4797 |
| Sheep and Beef | 2330 | 2629 | 2929 | 3329 | 4328 |
| Dairy Support | 2691 | 3026 | 3360 | | 4921 |

## 10.2 The impact of changing up the existing land use.

The business-as-usual model is one of adopting one preferred land use across the whole area being farmed. This may maximise the potential income within the current operator's skill base, but it is now and will increasingly be subject to limitations due to environmental restrictions. This forces us to examine what else can be done on our land which will improve the financial returns and at the same time reduce our environmental footprint. In other words what will our land use mix be in the future.

In the following three examples we suggest the possible range of EBITDA, N leaching and GHG results that would be possible by adopting a new land use across 20% of the area of a farm.

### Dairy Farm

The dairy example incorporates 80% existing farming system with 20% going into Pipfruit.

**Table 7: Possible land use mix of a dairy farm. ($/ha).**

| | Current | Future | Change |
|---|---|---|---|
| Revenue | 12,527 | 19,802 | 37% |
| Expenses | 6,712 | 12,285 | 45% |
| EBITDA | 5,816 | 7,517 | 23% |
| N (kg / ha) | 53 | 51 | -4% |
| GHG ( T / ha) | 15,704 | 12,593 | -25% |

On the dairy farm;

- The EBITDA increases by 23%.
- The N leaching stays the same.
- GHG is reduced by 25%.

[5] EBITDA = Earnings before interest tax depreciation and amortization are deducted. Put more simply it is the gross revenue minus the total working expenses.

## Arable Farm

The arable example incorporates 80% existing farming system with 20% going into Pipfruit

**Table 8: Possible land use mix of an arable farm. ($/ha).**

| | Current | Future | Change |
|---|---|---|---|
| Revenue | 4,797 | 13,618 | 65% |
| Expenses | 2,398 | 8,835 | 73% |
| EBITDA | 2,399 | 4,783 | 50% |
| N (kg / ha) | 47 | 46 | -2% |
| GHG (T / ha) | 5,353 | 4,312 | -24% |

On the arable farm;

- The EBITDA increases by 50%.
- The N leaching stays the same.
- GHG is reduced by 24%.

## Dairy Support Farm

The Dairy Support example incorporates 80% existing farming system with 20% going into sheep milking.

**Table 9: Possible land use mix of a dairy support farm. ($/ha).**

| | Current | Future | Change |
|---|---|---|---|
| Revenue | 4,459 | 6,219 | 28% |
| Expenses | 1,768 | 2,907 | 39% |
| EBITDA | 2,691 | 3,311 | 19% |
| N (kg / ha) | 49 | 46 | -6% |
| GHG (T / ha) | 6,372 | 6,206 | -3% |

On the arable farm;

- The EBITDA increases by 19%.
- The N leaching decreases by 6%.
- GHG stays the same.

These value-share scenarios while hypothetical, provide some inspiration for the future that with reliable water backed by storage, there are a range of viable options that with hard work, can be activated for WIL farmers to capture further value back to the farm.

Land use is a tool in the toolbox to improve grower/producers' ability to meet nitrogen and GNG reductions over time. Currently WIL shareholders are achieving impressive N loss reductions. This means that, while N levels on some farms don't directly reduce with the inclusion of a change in landuse, the economic benefits may then enable the reduction of stocking rates to achieve the required N reduction with no loss in revenue and the potential to convert low productive land to conservation plantings with other future benefits.

WIL have the opportunity to, with reliable water through scheme storage, provide a focus on supporting land use and value chain changes that ensure the economic and environmental resilience and prosperity for landowners into the future.