# Land Use Diversification

## Challenges and opportunities for three North Canterbury farmers

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Report prepared by

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RURAL CONSULTING

# 1 Document Details

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# 3 Executive Summary

There is a growing interest across New Zealand's Agricultural sector in land use diversification. This is being driven by a change in local and national climate, increased public and market interest in the sustainability of our farm systems and a regulatory framework aimed at continual improvement in water quality across Aotearoa.

This project concentrated on the unique opportunity to assess three separate farm businesses and the proposed changes to their systems, illustrating the environmental impacts and economic considerations of each. Desktop modelling utilizing Overseer compared how these changes, which aimed to suit the biophysical and operational abilities of each business, could benefit water quality in the same catchment. With relevance to farm systems throughout New Zealand, the project also attempts to quantify the potential benefits of working collectively within a catchment to address freshwater quality, utilizing solutions which are tailored to the capability of individuals and their farms inherent natural features.

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# 5 Introduction

There have been a number of drivers across New Zealand's agricultural history which have led to land use diversification. The removal of subsidies in the late 20th century was one such catalyst which forced New Zealand farmers to adapt to new market conditions and arose from significant economic policy change. Fast forward to the modern era and policy of a different kind is influencing farmers perspectives on sustainable land use, both economically, but perhaps more than ever, environmentally. The introduction of the Resource Management Act, National Policy Statement for Freshwater and associated National Environmental Standards have all played a part in attempting to promote sustainable land use and in effect have set expectations on landowners in relation to their management of natural resources. This evolution raises a crucial question: How does land use diversification enhance environmental management, and what are the associated economic considerations?

# 6 Methodology

Building on the need for a greater understanding of the potential environmental benefits and economic considerations associated with land use diversification at both the individual and catchment level, this project aimed to quantify this through a desktop modelling exercise. The methodology aimed to provide three hypothetical farm system changes which were realistic for the case studies locality.

## 6.1 Case Studies Selection

Three case study farms were selected which all exist within the same primary watershed catchment area of the Waiau River in North Canterbury. Each farm was selected based on their current farm systems and realistic ability to operate under proposed land use diversification option.

## 6.2 Data Collection

Individual biophysical and economic data was collected alongside farmer interviews to discuss each suggested change and each farmers drivers for investigating land use diversification.

## 6.3 Environmental Analysis

An environmental footprint comparison was drawn using OverseerFM[1] modelling, contrasting pre- and post-adoption of land use diversification options. This aimed to highlight the potential collective environmental benefits of each land use diversification option at a catchment scale and provide brief supporting commentary of this approach's effectiveness.

## 6.4 Economic Considerations

The estimated cost of incorporating land use diversification options into each farm system was explored through break downs of expected capital cost structure and basic gross margin breakdown for the Arable catch crop inclusion at Chamrousse.

## 6.5 Farmer Feedback

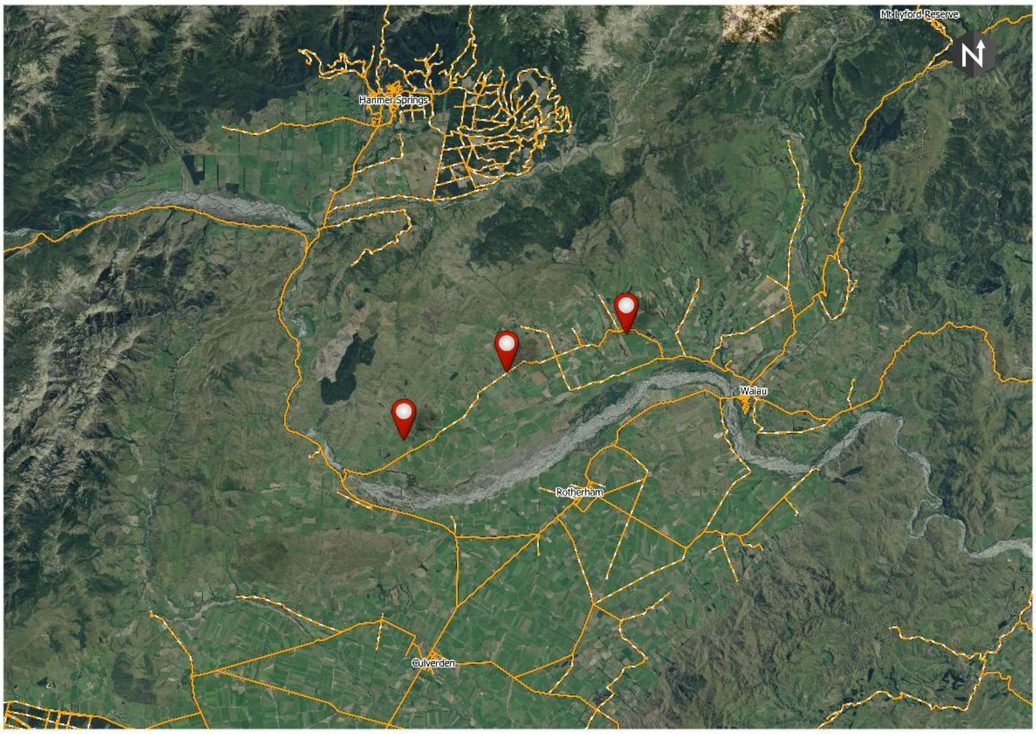
Farmer feedback relating to each land use diversification option was also sought to understand from a landowner's perspective the potential opportunities, challenges and barriers arising from each.

[1] Version 6.5.4

# 7 DETAILS OF CASE STUDY FARMS

To enable an assessment of the potential cumulative impacts of the land use diversification changes suggested, three farm within the same catchment were chosen. The three farms are Leslie Hills, Chamrousse and Edale. The following map illustrates their locations within the Waiau Uwha River catchment.

*Map 1. Case study farm locations*




## 7.1 LESLIE HILLS

The Leslie Hills property is a 2,266-hectare diverse farm system located 15 minutes North of the Culverden township in the Hurunui District of North Canterbury. The property runs adjacent to the Waiau Uwha River, approximately 65km inland from the mouth. Annual rainfall for the area is estimated to average 850mm-900mm. Leslie Hills is run by the Rutherford family who incorporate an irrigated dairy platform alongside irrigated dairy support whilst the dryland hill country is utilised for sheep and beef breeding. A mix of Fodder Beet and Kale is grown through the winter months to support animal feed requirements.

### 7.1.1 Land Use Diversification Option Investigated

The Leslie Hills property explored the option of converting 25-hectares of their current dairy platform into the production of Apples. The farm system changes made as a result of this was to assume a reduction in total cow numbers by the current stocking rate per hectare multiplied by the area removed, in this case 25-hectares. This saw a 5.6% reduction in total cow numbers under the new Apples scenario in comparison to the current base system. This reduction in cow numbers also enabled an assumed decrease in Winter fodder crop area by 6-hectares and subsequent fertiliser input reduction of 7.7% of total Nitrogen applied.

## 7.2 CHAMROUSSE

The Chamrousse operation is spread across two blocks known as "Chamrousse "and "Pass Stream" which together account for 610 hectares. The property is located 20 minutes North of the Culverden township in the Hurunui District of North Canterbury. The property runs adjacent to Pass Stream for approximately 6.3 kilometres. Pass Stream eventually discharges to the Waiau Uwha River approximately 5 kilometres downstream. Annual rainfall for the property averages 850mm-950mm annually. Chamrousse is run by the Florance family who have just over 50% of the property irrigated which enables consistent winter crop yields and the subsequent ability to winter dairy cows through the June and July period on Fodder Beet and Kale while also growing out young dairy replacement stock on high quality grass.

### 7.2.1 Land Use Diversification Option Investigated

The Chamrousse farming operation assessed the impacts of introducing a specific arable crop following the final defoliation of Fodder Beet in late Winter. This involved the proposed sowing of Barley in late August to be taken through until February where the crop would then be harvested for grain. At this point of the crop cycle, it was proposed that permanent pasture would then be Autumn sown. This had minimal impact on stocking rates however the inclusion of the arable "catch crop" across the entirety of winter feed area grown led to significant increases in total grain yield and a reduction of area sown in winter fodder crop by 13%. This resulted in an estimated 4.8% reduction in total Nitrogen fertiliser applied.

## 7.3 EDALE

The Edale property is a 545-hectare diverse farm system located 10 minutes Northwest of the Waiau township in the Hurunui District of North Canterbury. The property incorporates the Lyndon Stream for 4.5km approximately before a confluence with Home Stream. Home Stream then runs through Edale for a further 0.5km before joining the Waiau Uwha River 400m south of the Edale farm boundary. The annual rainfall for the area ranges from 850mm-1000mm annually. Edale is managed by the Gardner family and incorporates an irrigated dairy platform alongside dryland dairy support and sheep breeding and finishing enterprises. Barley grain is also grown on the property as well as winter crops of Fodder Beet and Kale to support animal feed requirements.

### 7.3.1 Land Use Diversification Option Investigated

The construction of a composting barn for the wintering of dairy cows and the associated changes to enable feasible management was investigated for Edale. This involved obvious changes to the feeding regime of the cows through the May, June, July and early August months and the need for additional feed to be incorporated which could be fed in the barn. Maize silage was the option chosen due to its relatively high dry matter and metabolizable energy to dry matter ratio in comparison to other silage options. This also reduced the total area required for barn feed production and the Maize crop rotation also fitted well with the Gardner family's current commitment to Barley production post-harvest. There were no changes in stocking rate modelled. Winter fodder crop area reduced by 86% due to the incorporation of the composting barn and a 4.2% decrease in total Nitrogen fertiliser was assumed.

# 8 ENVIRONMENTAL ANALYSIS

This section details an environmental analysis performed using the OverseerFM model to compare predicted changes arising from each land use diversification change implemented across the three case study farms. The model's main metrics of interest were Nitrate, Phosphorus, and Greenhouse Gas losses. Insights drawn from observed and practical farm systems helped make educated assumptions about overland flow, critical source areas, and the potential risks of contaminant loss. Overseer FM's inability to accurately simulate composting barns Greenhouse Gas Emissions is a limitation. Given these structures are somewhat of a novelty in New Zealand and therefore limitations in scientific data available, there are inherent constraints in the model. For consistency, this analysis followed the same methodology as utilised in previous Our Land and Water projects which focused on the benefits of composting barn structures.

## 8.1 LESLIE HILLS

Leslie Hills environmental performance, resulting from the inclusion of 25-hectares of Apples, reveals significant improvements, particularly in total N loss, N loss per hectare and total P loss.

*Table 1. Nutrient changes resulting from land use diversification option.*

| | FACTOR | INCREASE/DECREASE | PERCENTAGE |
|---|---|---|---|
| **NITROGEN** | Total loss (kg) | Decrease | 8.7% |
| | Loss/ha (kg/ha) | Decrease | 10.8% |
| | N Surplus (kg/ha) | Decrease | 5.5% |
| **PHOSPHORUS** | Total loss (kg) | Decrease | 6.1% |
| | Loss/ha (kg/ha) | No change | No change |
| | P Surplus (kg/ha) | Decrease | 8.6% |

Table 1 above illustrates the positive environmental outcomes resulting from the incorporation of the land use diversification option. The total N loss and N loss per hectare decreases are primarily driven by a 7.7% reduction in fertiliser applied alongside an 8.3% reduction in N leaching from urine patches as a result of 25ha being removed from grazing for apple production. N surplus also reduced by 5.5%. A 33% increase in transfer of N via standing plant material was suggested via the OverseerFM model which accounts for a greater uptake from the Apple crop than would otherwise occur in a pastoral setting. Reductions were also observed for Phosphorus. Total P loss reduced by 6.1% and P surplus also reduced by 8.6%. According to the OverseerFM modelling, this was mainly driven by an 8.3% reduction in P fertiliser inputs.

*Table 2. Greenhouse Gas Emission changes resulting from land use diversification option.*

| FACTOR | INCREASE/DECREASE | PERCENTAGE |
|---|---|---|
| **CO2 (CO2-E TONNES/YR)** | Decrease | 5.5% |
| **METHANE (CO2-E TONNES/YR)** | Decrease | 5.8% |
| **N2O (CO2-E TONNES/YR)** | Decrease | 6.1% |
| **TOTAL GHG EMISSIONS (CO2-E TONNES/YR)** | Decrease | 3.8% |

Greenhouse Gas Emissions followed a similar decreasing trend as observed for Nutrients across Leslie Hills following the adoption of the Apple crop. This is evident in Table 2 where we see a consistent decrease in each Greenhouse Gas with the largest reduction observed in Nitrous Oxide ($N_20$) emissions. The primary drivers of these emission reductions can be further investigated via Table 3 where we see the biggest reduction contributions coming for Methane from enteric sources and arise from the reduction in cow numbers to accommodate the Apple crop area. Nitrous Oxide total reductions are heavily impacted by the 19.57% decrease in emissions from crop sources. This correlates with the overall reduction of cropping area by 6-hecatres. Overall, Carbon Dioxide emission decreases were primarily driven by the reduction in fertiliser usage and subsequent assumed reduction in manufacturing requirements. All these factors combined to contribute to a total decrease in GHG emissions by 3.8% or 306.4 tonnes C02-e/year.

*Table 3. Summary of key drivers impacting Greenhouse Gas Emission reductions.*

| | SOURCE | BASEFILE (CO2-E KG/HA/YR) | APPLES INCLUDED (CO2-E KG/HA/YR) | PERCENTAGE REDUCTION |
|---|---|---|---|---|
| **METHANE** | Enteric | 6900 | 6501 | 5.78% |
| | Dung | 72 | 69 | 4.17% |
| | Effluent | 53 | 50 | 5.66% |
| **NITROUS OXIDE** | Excreta Paddock | 1481 | 1405 | 5.13% |
| | Excreta Effluent | 16 | 15 | 6.25% |
| | N Fertiliser | 435 | 402 | 7.59% |
| | Crops | 46 | 37 | 19.57% |
| | Indirect | 398 | 371 | 6.78% |
| **CARBON DIOXIDE** | N Fertiliser | 615 | 574 | 6.67% |
| | Fertiliser Organic Inputs | 133 | 122 | 8.27% |
| | Lime | 115 | 105 | 8.70% |
| | Supplements | 640 | 609 | 4.84% |

## 8.2 CHAMROUSSE

Chamrousse's environmental performance changes mirror those observed at Leslie Hills in relation to overall decreases in both nutrient and greenhouse gas emission loss. However, there were considerably larger gains made in reducing N loss per hectare and subsequent total N loss.

*Table 4. Nutrient changes resulting from land use diversification option.*

| | FACTOR | INCREASE/DECREASE | PERCENTAGE |
|---|---|---|---|
| **NITROGEN** | Total loss (kg) | Decrease | 27% |
| | Loss/ha (kg/ha) | Decrease | 26.3% |
| | N Surplus (kg/ha) | Decrease | 12.9% |
| **PHOSPHORUS** | Total loss (kg) | Decrease | 13.8% |
| | Loss/ha (kg/ha) | No change | No change |
| | P Surplus (kg/ha) | Decrease | 13% |

Table 4 illustrates the considerable nutrient loss rate decreases arising from the incorporation of the Barley crop following Fodder Beet winter grazing, serving as a catch crop for uptake of excess nutrients. Total N loss reduced by 27% following the modelled scenario including Barley and also reduced by 26.3% when measured using the kg/ha metric. The primary drivers of these reductions include a 6.5% decrease in Nitrogen inputs via fertiliser under the Barley catch crop scenario as well as a 22.2% lowering of urine patch leaching and 36.4% reduction in leaching other than urine patches. The decreases in each of the leaching situations align less with an overall lowering in Winter fodder crop area (only 2.21% reduced) but more with the value of establishing the Barley crop early to utilise any residual nitrogen remaining form the previous Winter crop. Decreases in total phosphorus (P) loss and P surplus are primarily driven by additional P removal through barley grain harvested and transported off the farm, along with a perceived change in plant-available P in the inorganic soil pool, attributed to an expanded area under feed barley production.

*Table 5. Greenhouse Gas Emission changes resulting from land use diversification option.*

| FACTOR | INCREASE/DECREASE | PERCENTAGE |
|---|---|---|
| **CO2 (CO2-E TONNES/YR)** | Decrease | 3.8% |
| **METHANE (CO2-E TONNES/YR)** | Decrease | 3.3% |
| **N2O (CO2-E TONNES/YR)** | Decrease | 7.2% |
| **TOTAL GHG EMISSIONS (CO2-E TONNES/YR)** | Decrease | 1.1% |

There were also notable decreases observed for Greenhouse Gas Emissions following the inclusion of the land use diversification option for Chamrousse. The largest reduction was seen in the Nitrous Oxide ($N_2$0) gas with a 7.2% decrease as seen in Table 5. The primary drivers of this are driven by a 9.68%

lowering in $N_20$ produced through excreta in the paddock and a 16.8% decrease from indirect losses such as volatilisation. The inclusion of the Barley catch crop did contribute to 25.1% increase in losses originating from crop establishment however this was not significant enough to cause a net $N_20$ increase. The 3.3% and 3.8% reduction in Methane and Carbon Dioxide (Table 5) were primarily driven by a lowering of enteric CH4 production and decreases in Lime usage as seen in Table 6.

*Table 6. Summary of key drivers impacting Greenhouse Gas Emission reductions.*

| | SOURCE | BASEFILE (CO2-E KG/HA/YR) | BARLEY INCLUDED (CO2-E KG/HA/YR) | PERCENTAGE REDUCTION |
|---|---|---|---|---|
| **METHANE** | Enteric | 3566 | 3445 | 3.39% |
| | Dung | 76 | 77 | 1.30% (increase) |
| | Effluent | 1 | 1 | 0% |
| **NITROUS OXIDE** | Excreta Paddock | 682 | 616 | 9.68% |
| | Excreta Effluent | 0 | 0 | 0% |
| | N Fertiliser | 96 | 92 | 4.17% |
| | Crops | 73 | 98 | 25.1% (increase) |
| | Indirect | 167 | 139 | 16.8% |
| **CARBON DIOXIDE** | N Fertiliser | 104 | 98 | 5.77% |
| | Fertiliser Organic Inputs | 121 | 120 | 0.83% |
| | Lime | 69 | 51 | 26.09% |
| | Supplements | 83 | 83 | 0% |

## 8.3 Edale

The incorporation of the composting barn into the Edale farm system initiated similar environmental outcomes to the previous two case study farms with reductions in total N loss, N loss per hectare and Total P loss.

*Table 7. Nutrient changes resulting from land use diversification option.*

| | FACTOR | INCREASE/DECREASE | PERCENTAGE |
|---|---|---|---|
| **NITROGEN** | Total loss (kg) | Decrease | 7.8% |
| | Loss/ha (kg/ha) | Decrease | 6.9% |
| | N Surplus (kg/ha) | Decrease | 13% |
| **PHOSPHORUS** | Total loss (kg) | Decrease | 4.1% |
| | Loss/ha (kg/ha) | No change | No change |
| | P Surplus (kg/ha) | No change | No change |

Expected outcomes from the composting barn structure on N loss for Edale did not meet the same level of reductions seen in previous research papers. Both Macbeth, Millar & Hepburn (2023) and Durie & Woodford (2022) estimated N loss reductions from the incorporation of composting barn structures to be more than 40kg/N/ha/yr. It is important to note however that many case study farms in each of these research projects were dairy systems only and did not possess the diversity across the operation that Edale does. This in of itself had a profound effect on lowering N loss numbers in the Edale base system, illustrating the good work that is already underway addressing N loss but subsequently leaving less room for substantial N loss declines. Nevertheless, OverseerFM modelling still indicated a potential 7.8% decrease in Total N loss alongside an expected 6.9% decrease in N loss per hectare. This was primarily driven by a 3.9% lowering in Nitrogen fertiliser inputs, 5.6% decrease in urine patch leaching and a 9.1% reduction in leaching other than urine patches. The proposed lowering of N leaching aligns with the removal of cows on winter crop through the high soil drainage periods and subsequent elimination of 86% of winter crop grown. Total P loss reductions of 4.1% were minor and were primarily driven by additional product removed as supplement to feed cows in the barn.

*Table 8. Greenhouse Gas Emission changes resulting from land use diversification option.*

| FACTOR | INCREASE/DECREASE | PERCENTAGE |
|---|---|---|
| **CO2 (CO2-E TONNES/YR)** | Decrease | 0.1% |
| **METHANE (CO2-E TONNES/YR)** | Increase | 0.8% |
| **N2O (CO2-E TONNES/YR)** | Decrease | 0.4% |
| **TOTAL GHG EMISSIONS (CO2-E TONNES/YR)** | Decrease | 4.6% |

Greenhouse Gas Emission reduction was relatively modest for the Edale operation. As alluded to in the opening paragraph of this section, there is limitations to the OverseerFM model in accurately accounting for the impact of composting barn structures on individual and overall gross farm greenhouse gas emissions. However, an overall decrease by 4.6% in total greenhouse gas emissions was predicted by the model. This was largely driven by considerable decreases in $N_20$ emissions from crops and reductions of Methane in dung as a larger majority of this would be captured during time in the barn structure. Notable increases in emissions from effluent and excreta effluent caused by the inclusion of the housed structure can be seen in Table 9, however these challenges have the potential to be addressed through good composting bedding material management and the opportunity to easily introduce methane inhibiting feed additives in future due to the barn feeding regime.

*Table 9. Summary of key drivers impacting Greenhouse Gas Emission reductions.*

| | SOURCE | BASEFILE (CO2-E KG/HA/YR) | BARN INCLUDED (CO2-E KG/HA/YR) | PERCENTAGE REDUCTION |
|---|---|---|---|---|
| **METHANE** | Enteric | 4013 | 3995 | 0.45% |
| | Dung | 44 | 41 | 6.82% |
| | Effluent | 57 | 111 | 48.65% (increase) |
| **NITROUS OXIDE** | Excreta Paddock | 909 | 879 | 3.3% |
| | Excreta Effluent | 5 | 62 | 91.94% (increase) |
| | N Fertiliser | 219 | 210 | 4.12% |
| | Crops | 36 | 9 | 75% |
| | Indirect | 251 | 254 | 1.18% (increase) |
| **CARBON DIOXIDE** | N Fertiliser | 308 | 294 | 5.77% |
| | Fertiliser Organic Inputs | 131 | 131 | 4.55% |
| | Supplements | 34 | 33 | 2.94% |

## 8.4 Non-OverseerFM Modelled Environmental Analysis

There are several environmental changes not highlighted in the OverseerFM modelling that would arise because of the adoption of each land use diversification option. These include potential improvements in overland flow management, reduction in the number of critical source areas, potential reduction in contaminant loss from reduced winter fodder cropping area, and avoidance of soil compaction.

Each case study farm saw a general decreasing trend in the area dedicated to winter fodder crops after introducing each land use diversification option. This is anticipated to lead to an overall reduction in the risk of overland contaminant flow. The farms all had a larger area under permanent vegetation as a result of the proposed changes, especially in the high-risk winter months. This in suggested to translate into a decrease in the chances of fluvial soil erosion during intense rainfall episodes – a primary source of contaminant losses. It is also likely that the decline in winter fodder crop area would also coincide with a decrease in critical source areas, leading to a perceived reduction in nutrients and pathogens entering local water bodies. Soil compaction has the potential to exasperate the risk of overland contaminant flow risk because it reduces the soil's water infiltration capacity. On all the case study farms, this risk would also be expected to decrease due to a move away from intensive grazing during winter periods, this would be maximised in the composting barn scenario where cows would be off paddocks for the entirety of the high-risk period.

In summary, the OverseerFM modelling clearly demonstrates the potential for notable decreases in Nitrogen, Phosphorus and Greenhouse Gas emissions across the three land use diversification options.

The paragraph above also emphasises the potential for wider environmental benefits which are outside the scope of OverseerFM modelling. The main driving forces behind these reductions are the reduced dependency on synthetic Nitrogen fertiliser, reduced winter fodder cropping area and enhanced capability to utilise high N concentration in urine following winter grazing periods. A deeper exploration is necessary to gain a more accurate understanding of each land use diversifications contribution to Greenhouse Gas emissions, particularly as a tax charge for on-farm emissions looms.

# 9 CUMULATIVE ENVIRONMENTAL EFFECTS OF LAND USE DIVERSIFICATION

The cumulative environmental impact of the changes modelled across each case study farm can be seen in Table 10. Based on OverseerFM the potential decrease in total Nitrogen loss below the root zone was 5,969kg/N/yr. This was a 13% reduction when comparing against the base file analysis for each of the three case study farms. A similar percentage decrease was witnessed for Phosphorus resulting in a decrease of 77kg/P/yr lost to the environment. This was an 8% reduction comparison to the base file analysis. An aggregated 3.6% reduction in Greenhouse Gas emissions was also observed, resulting in a total decrease of 430 $CO_2$-e tonnes/yr as observed in Table 10.

*Table 10. Aggregated environmental reductions expected across the 3 case study farms following adoption of land use diversification options.*

| FACTOR | METRIC REDUCTION | PERCENTAGE REDUCTION |
|---|---|---|
| NITROGEN | 5,969kg/N/yr | 13% |
| PHOSPHORUS | 77kg/P/yr | 8% |
| GREENHOUSE GAS EMISSIONS | 430 $CO_2$-e tonnes/yr | 3.6% |

The information contained in Table 10 assists in illustrating the potential benefits from addressing the challenges facing the New Zealand agricultural industry at a catchment level. Whilst it is acknowledged that this may be difficult to administer in relation to Greenhouse Gas emission management, the results demonstrate the potential benefits to addressing water quality challenges in this manner. Each land use diversification option has been tailored to suit the interest and perceived capability of the landowner, leading to the potential for greater engagement in the process but also a more balanced and realistic economic outcome. The three changes assist in illustrating that there is the potential to significantly reduce contaminant loading through a multi-faceted approach rather than one recommended solution to be undertaken by the variety of complex and diverse farm systems.

# 10 Economic Considerations

The purpose of this part of the project was to illustrate a high-level appreciation for the perceived economic requirements to execute each land use diversification option across the three case study farms. Every attempt has been made to ensure that the financial figures are as accurate as possible however this was not an exercise involving deep financial projections or review.

## 10.1 Leslie Hills

To gain a credible understanding of the potential financial ramifications of converting 25ha to Apple production on Leslie Hills, Greg Dryden from Fruition Horticulture was contracted to provide a financial analysis of the development. A full breakdown of the development budget, expenses and cashflow, working expenses and potential valuation can be found in the appendix labelled 1.

Figure 1 illustrates the overall investment summary associated with the diversification to Apple production on land currently utilised for pastoral dairy production. While there is a significant saving in relation to land costs, given the property is already owned by the Rutherford family, total capital costs of $12,751,474 present a significant challenge. Developement costs make up 51% of this captital outlay which introduce an immediate financial hurdle to any landowner wishing to pursue this venture. Accumulated Cash Surplus does not reach a positive figure until Year 10 which coincides with yield production maximising in a similar timeframe as seen in Figure 2 and the Breakeven period in Figure 1.

*Figure 1. Investment Summary of establishing 25ha in apple Production.*

**Investment Summary**

| | |
|---|---|
| Development planted area | 25 |
| Peak RTE | 3,196,023 |
| Peak average yield (T/ha) | 75 |
| Land costs | $0 |
| Development | $6,558,974 |
| Plant and machinery | $1,592,500 |
| Accommodation | $2,100,000 |
| Licence fees | $2,500,000 |
| **Total Capital** | **$12,751,474** |
| Mature Income | $6,752,900 |
| Mature Expenditure | $2,341,000 |
| Mature EBITDA | $4,411,900 |
| Mature EBITDA ($/ha) | $176,000 |
| Mature Permanent FTE's | 9 |
| Mature Peak Casual FTE's | 69 |
| Mature Annual Casual FTE's | 24 |
| **20 Year Summary** | |
| Accumulated Cash Surplus | $48,910,997 |
| NPV (10%) | $12,985,970 |
| Breakeven (years) | 10 |
| XIRR (20 years) | 15.0% |
| XIRR (15 years) | 13.6% |
| XIRR (10 years) | 9.1% |

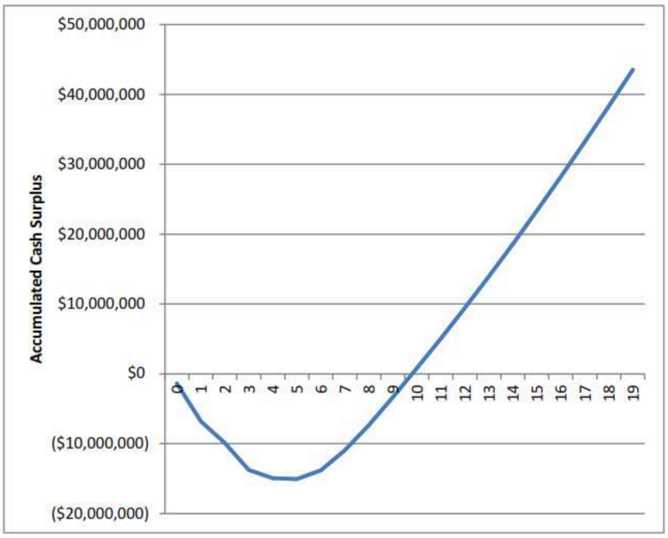



Figure 1 also highlights the significant increase in reliance on staff. 9 mature permanent FTE's is not dissimilar to current staffing requirements across the business however peak casual FTEs of 69 during harvest highlights a potential risk given the challenges New Zealand and the agricultural industry is facing regarding the acquisition of skilled staff. This also initiates a requirement to provide suitable accommodation options during harvest periods for a large number of casual employees, another challenge to overcome in the shorter-term phase of the development, although as Figure 2 highlights, first harvest is not expected until Year 3 of crop establishment.

*Figure 2. Expected yield production across a 10-year horizon.*

**PRODUCTION**

| | | |
|---|---|---|
| Bin weight (Rockit) | 420 | kg |
| RTE | 0.440 | kg |

| Crop | Gross Yield (RTE/ha) | Proportion of Planted Area | Area (ha) | Class I packout | Class I yield (RTE) | Class I Price (RTE) | Class II /Reject price | Target Ave Size | Tonnes /ha | Bins /ha |
|---|---|---|---|---|---|---|---|---|---|---|
| Rockit 2D CG202 2025 | 170,455 | 100% | 25.0 | 75% | 127,841 | $1.75 | $0.16 | 205 | 75 | 179 |
| | | | 25.0 | | | | | | | |

| YIELD ACCUMULATION | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|
| Crop | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
| Rockit 2D CG202 2025 | 0% | 0% | 15% | 25% | 40% | 65% | 85% | 95% | 100% | 100% |

GROSS YIELD

| Crop | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rockit 2D CG202 2025 | 0 | 0 | 639,205 | 1,065,341 | 1,704,545 | 2,769,886 | 3,622,159 | 4,048,295 | 4,261,364 | 4,261,364 |

CLASS I YIELD

| Crop | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rockit 2D CG202 2025 | 0 | 0 | 479,403 | 799,006 | 1,278,409 | 2,077,415 | 2,716,619 | 3,036,222 | 3,196,023 | 3,196,023 |

CLASS II YIELD

| Crop | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rockit 2D CG202 2025 | 0 | 0 | 159,801 | 266,335 | 426,136 | 692,472 | 905,540 | 1,012,074 | 1,065,341 | 1,065,341 |

## 10.2 Chamrousse

Conducting the financial analysis for the Chamrousse land use diversification option was somewhat more straight forward given the reduced capital requirement to implement the initiative. Rather than a large-scale conversion or construction project like the other two case study farms, the Chamrousse option looked at a subtle change to an existing cropping rotation to maximise the potential environmental outcomes for limited costs.

Figure 3 presents a basic Gross Margin analysis of the incorporation of Barley as a catch crop following the winter grazing of Fodder Beet using DairyNZ’s catch crop gross margin analysis tool. While every effort has been made to ensure these figures are accurate some factors with be annually variable such as contractor costs and the price paid for feed Barley. Nevertheless, Figure 3 paints a favourable picture in terms of profitability for the inclusion of the catch crop. It is worth noting that the exclusion of contractor costs for crop establishment is based on the knowledge the Florance family conduct most of their own cultivation work. There has also been no allowance for the application of fertiliser as it is assumed the crop will obtain enough nutrients from the residuals left from the previous winter crop. The suggested gross margin outcome aligns with previous trials conducted by a DairyNZ led collaborative research programme titled “Forages for Reduced Nitrate Leaching” which concluded in 2019. This study found that catch crops had the potential to produce gross margins of $1,261/ha on average with some mirroring similar results to Figure 3 of $1,946/ha.

*Figure 3. Barley catch crop gross margin analysis.*

| | | | | | |
|---|---|---|---|---|---|
| Crop: | Barley | Product: Grain Harvest | | | |
| Gross margin/hec | $ 1,968 | | | | |
| Location: | Canterbury | | | | |
| Sowing date | 20-Aug-23 | | | | |
| Harvest date: | 1-Feb-24 | | | | |
| Days in crop: | 165 | | | | |
| ***DIRECT INCOME - per hectare:*** | | | | | |
| *Notes* | | Yield/ha | UOM | price/unit | total |
| Grain @ $400/tonne | | 8 | tonne | $ 400.00 | $ 3,200 |
| | | | | **Total Income:** | **$ 3,200** |
| ***VARIABLE COSTS - per hectare:*** | | | | | |
| *Process* | Detail | Quantity | UOM | cost/unit | total |
| *Soil test* | 150 mm sample per paddock | 1 | each | $ 60 | $ 60 |
| *Initial Spray* | Contractor | 1 | hectare | $ 26 | $ 26 |
| | Chemical - glyphosate | 3 | litres | $ 15 | $ 45 |
| *Seed* | Barley seed | 120 | kg/ha | $ 1.50 | $ 180 |
| *Weed & Pest* | Herbicide - post plant | 1 | Appln | $ 40 | $ 40 |
| | Application | 1 | Pass | $ 26 | $ 26 |
| *Irrigation* | | 1 | | $ 390 | $ 390 |
| *Cartage* | | 1 | | $ 40 | $ 40 |
| *Other costs* | Harvest | 1 | hectare | $ 390 | $ 390 |
| *Interest cost** | on expenditure | $ 4.10 | Months | 8.5% | $ 35 |
| | | | | **Total Expenditure:** | **$ 1,232** |
| | | | | **Crop Gross Margin:** | **$ 1,968** |

## 10.3 EDALE

The initial costs associated with the implementation of the composting barn at Edale are based on a collection of information obtained from previous Our Land and Water research projects conducted by Macbeth, Millar & Hepburn (2023) and Durie & Woodford (2022) which focused on analysing financial requirements for structures which were already operational.

Figure 4 highlights the expected capital expenditure required to construct a composting barn capable of housing 510 cows at an allowance of 7.5m2 per cow. Total capital costs required workout at $4,477 per cow which aligns with the research findings of Macbeth, Millar & Hepburn (2023). Figure 4 Woodchip requirements assumes a depth of 750mm across the bedding area while the Plant & Equipment figure includes an allowance for the purchase of a mixer wagon, tractor for tilling, tractor for towing the mixer wagon, deep ripper attachment for compost management and a muck spreader.

*Figure 4. Expected capital expenditure required to establish a composting barn at Edale.*

| CAPITAL ITEM | COST (EXCL GST) |
|---|---|
| BARN CONSTRUCTION | $1,560,600.00 |
| SITEWORKS AND CONCRETE | $423,300.00 |
| WOODCHIP | $73,950.00 |
| PLANT & EQUIPMENT | $225,420.00 |
| *TOTAL CAPITAL COST EXPECTED:* | ***$2,283,270.00*** |

A similar trend emerges when comparing the challenges for both the Leslie Hills and Edale land use diversification options. The upfront capital requirement of $2,283,270 to stimulate the project is a formidable barrier and potentially requires additional incentives beyond environmental improvements to warrant this type of investment. Increases in Farm Working Expenses are also anticipated to rise by approximately 3.2% based on data provided in both Macbeth, Millar & Hepburn (2023) and Durie & Woodford (2022) research. This is primarily driven by increased fuel consumption, repairs and maintenance on the barn structure and plant and equipment, rise in insurance required and additional vehicle expenses. Potential expense cost savings could also be made however with a reduction in winter feed crops and subsequent fertiliser and re-grassing requirements.

# 11 Farmer Feedback

Throughout the process of this research project, farmer interviews have been conducted to understand each operations interest in land use diversification and what drives this interest. These interviews involved a range of in-person discussions as well as video calls and telephone calls. Each interaction was a valuable insight into a farmer's perspective on the practicalities and realities of implementing each case study farm option.

The primary themes explored during each interaction can be summarised into the following categories:

- Motivation for the interest in land use diversification.
- Opportunities involved with land use diversification.
- Challenges involved with land use diversification.

## 11.1 Motivation for the interest in land use diversification

The resounding feedback relating to general interest in land use diversification linked strongly with each case study farms ambition to build continued resilience into their individual businesses. While the economics of each option investigated were of considerable relevance it seemed much of the motivation was stemming from regulatory, market and social signals targeted at continuing to enhance environmental sustainability in agriculture. While each option explored on the three case study farms were unique by nature, each was driven by the landowners' own ambitions to collectively understand the potential positive outcomes for their catchment and surrounding community. Climatic changes experienced over recent periods in the district also contributed to certain farmers interest in how to mitigate this and what opportunities may present themselves because of this. Growing regulatory pressure and policy signals relating to freshwater quality also stimulated each landowner to engage in investigating alternative measures to address any potential concerns in future. A key point consistently raised was what would be involved in relation to the financial commitments for some of these alternative land use options and how would this measure against expected environmental outcomes. Through conversations with each case study farmer involved, one of the prominent take home points related to each individual's commitment to be future focused and progressive to ensure they continued to have sustainable businesses across environmental, economic and social pillars.

## 11.2 Opportunities involved with land use diversification

Given the variety of potential land use diversification changes investigated, each farmers opinions on the opportunities tended to expectedly vary. However, a consistent theme across all three case study farms related to the ability to maintain business viability into the future. The discussions relating to the potential benefits of incorporating the composting barn structure spanned matters relating to improvements in animal welfare stemming from winter management of cow condition, potential reductions made in relation to the properties environmental footprint and potential milk yield increases as a result of greater flexibility in managing cow nutrition. As the pressure to address Greenhouse Gas emissions rises for agriculture in New Zealand, housing type structures were also raised as a potential solution for methane reduction given the ease in offering feed additives but also improving feed utilisation. The Barley catch crop scenario was highlighted as a relatively cost-effective method for achieving what seemed like substantial gains in Nitrogen loss prevention which in itself is an opportunity for a number of farmers who possess the skillset and, in some cases, already include Barley as part of their cropping rotations. The potential establishment of an Apple crop also raised several opportunities. Farmer feedback highlighted the chance to diversify income streams and increase cashflow at different stages of the year. Attracting and expanding grower knowledge into the district was also seen as a large opportunity for farmers in the community as it builds localised data and resources relating to crop management, yield potentials and wider supply chain logistics knowledge. As with the production of most resources, the more a geographic area produces the more likely they are to also receive processing support which was noted as a potential barrier to uptake in the area. Other points raised relating to opportunities emerging from land use diversification linked to potential greater flexibility for business succession and the growth in new labour opportunities for local communities.

## 11.3 Challenges involved with land use diversification

With any relatively novel concept, the challenges are often the easiest to identify as so many of the opportunities hinge on the individual's ability to execute the idea and reliance on volatile markets is common. The primary challenges highlighted during the discussions with each case study farmer were for the most part relatively predictable given the changes suggested. For the two case study farms looking at the incorporation of a composting barn and conversion to Apples, the primary challenge as already highlighted was the capital costs to get the concepts underway. However, beyond this, the other points raised were the change in skillsets required to efficiently manage the new systems. This again was particularly emphasised for the Leslie Hills and Edale operations where the suggested changes would expose owners and staff to a reasonably new way of farming. The Chamrousse team highlighted the challenges with establishment of the Barley cover crop in late winter when seed germination could not be guaranteed. Other points raised emphasised the ongoing instability in the feed grain market and also the reduced ability for weed control in Fodder Beet crops. While succession was highlighted as a potential opportunity, it was also raised as a potential challenge, particularly for the interventions that may require the farming business to take on a higher debt loading that may be passed onto the next generation to manage. Over capitalising was also discussed when assessing the impact of high capital reliant changes and the need to manage the structure of how supporting infrastructure such as housing for casual workers in the Apples context might be managed to avoid this risk.

## 12 CONCLUSIONS

Land use diversification in the New Zealand context continues to be a common topic when looking at the future sustainability of our agricultural industry. What seems like a relatively straight forward procedure for investigation from the exterior soon requires a depth of detail to understand the holistic impact of any potential change. There will no doubt continue to be a fragile balance between achieving continued environmental sustainability goals while balancing the economic viability of suggested alternatives. Following the outcomes of this research it seems the uptake of land use diversification will hinge on the individual's financial situation and ability to absorb substantial changes to their current systems. This project has however highlighted the significant benefits to addressing some of the challenges facing our farming community at a broader, catchment level lens, enabling landowners to implement the changes that suit their individual situations and inherent natural features. From the research conducted each land use diversification option shows merit in addressing these key environmental metrics of Nitrogen, Phosphorus and Greenhouse Gas emissions whilst still offering medium to long term financial viability. The process has however highlighted the importance of seeking expert assistance to fully understand what each option will entail and whether this aligns with the business's objectives for the future.

# 13 References


Dairy NZ. (2019). *Catch crops*. https://www.dairynz.co.nz/feed/crops/catch-crops/.

Dairy NZ. (2019). *Catch Crops for Reduced Nitrate Leaching*. https://www.dairynz.co.nz/media/x0xhwwtc/catch-crop-guidelines_august2021.pdf.

Dairy NZ. (2023). *Cereals*. https://www.dairynz.co.nz/feed/crops/cereals/.

Dairy NZ. (2023). *Feed Values*. https://www.dairynz.co.nz/feed/fundamentals/feed-values/.

Durie, R., Woodford K.B. (2022) *Whole systems impacts of composting shelters in New Zealand*. Prepared for Our Land and Water Rural Professionals Fund 2021.

Hunt, J., Journeaux, P., Allen, J. (2021). *Barriers to Diversification*. https://ourlandandwater.nz/wp-content/uploads/2021/12/OLW_RPF27_Barriers-to-Diversification-Report_Final.pdf.

Macbeth, R., Millar, H., Hepburn, R. (2023). *Composting Mootels on the West Coast*. Prepared for Our Land and Water Rural Professionals Fund 2022.

MacLeod, C., Moller, H. (2006). *Intensification and diversification of New Zealand agriculture since 1960: An evaluation of current indicators of land use change*. https://www.sciencedirect.com/science/article/abs/pii/S016788090600034X.

# 14 APPENDICES

APPENDIX 1: Full Financial Analysis of 25ha Apple Crop Development

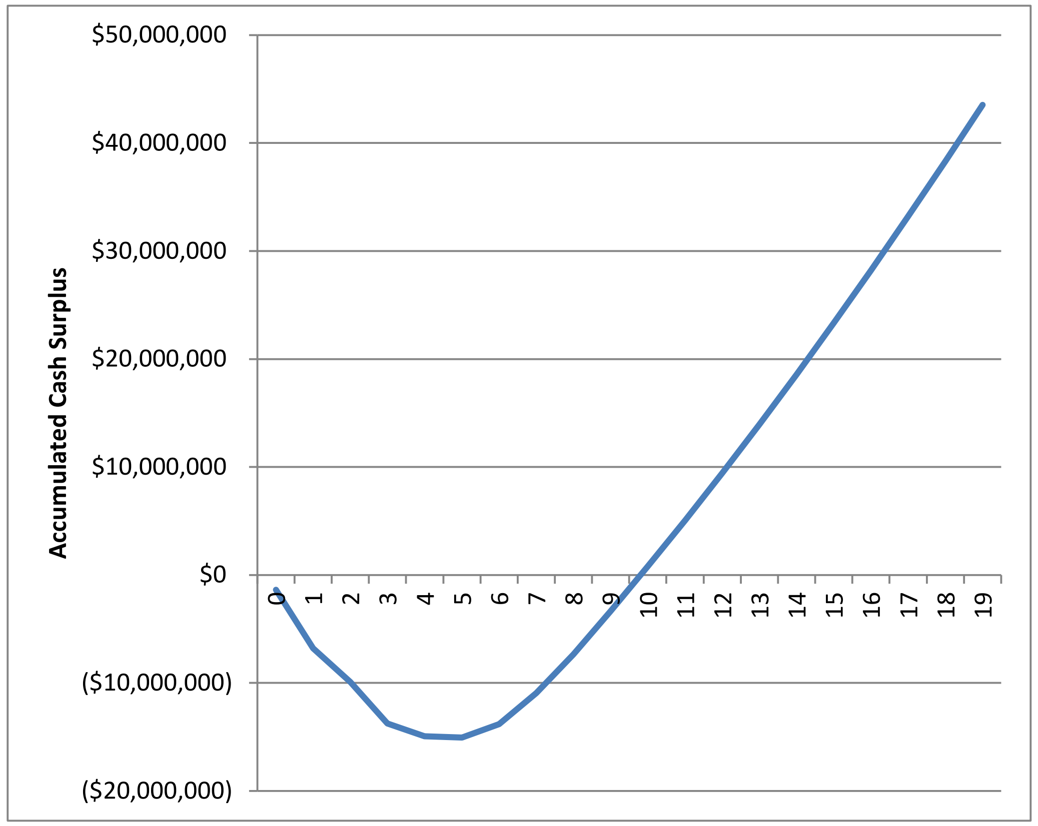
## SUMMARY    Leslie Hills redevelop Site B to Rockit

## Macroeconomic inputs

| | |
|---|---|
| Pricing Growth rate - NZD | 2.0% |
| Cost inflation | 2.0% |
| Capital growth of L&I | 2.0% |
| Depreciation rate | 10.0% |
| Discount rate | 10.0% |
| Salvage value | Valuation |

## Investment Summary

| | |
|---|---|
| Development planted area | 25 |
| Peak RTE | 3,196,023 |
| Peak average yield (T/ha) | 75 |
| Land costs | $0 |
| Development | $6,558,974 |
| Plant and machinery | $1,592,500 |
| Accommodation | $2,100,000 |
| Licence fees | $2,500,000 |
| **Total Capital** | **$12,751,474** |
| Mature Income | $6,752,900 |
| Mature Expenditure | $2,341,000 |
| Mature EBITDA | $4,411,900 |
| Mature EBITDA ($/ha) | $176,000 |
| Mature Permanent FTE's | 9 |
| Mature Peak Casual FTE's | 69 |
| Mature Annual Casual FTE's | 24 |
| **20 Year Summary** | |
| Accumulated Cash Surplus | $48,910,997 |
| NPV (10%) | $12,985,970 |
| Breakeven (years) | 10 |
| XIRR (20 years) | 15.0% |
| XIRR (15 years) | 13.6% |
| XIRR (10 years) | 9.1% |



**BUDGET**

| Total planted Area (ha) | 25 | ha |
|---|---|---|

**Year 0 – Year 10**

| | | | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Income** | ***Year end June*** | | ***2025*** | ***2026*** | ***2027*** | ***2028*** | ***2029*** | ***2030*** | ***2031*** | ***2032*** | ***2033*** | ***2034*** | ***2035*** |
| **Return level** | **Orchard Gate** | | ***Year 0*** | ***Year 1*** | ***Year 2*** | ***Year 3*** | ***Year 4*** | ***Year 5*** | ***Year 6*** | ***Year 7*** | ***Year 8*** | ***Year 9*** | ***Year 10*** |
| | Planted Area | | | 0 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| | Gross Yield (tce) | | | 0 | 0 | 639,205 | 1,065,341 | 1,704,545 | 2,769,886 | 3,622,159 | 4,048,295 | 4,261,364 | 4,261,364 |
| | Rockit Bins | | | 0 | 0 | 670 | 1,116 | 1,786 | 2,902 | 3,795 | 4,241 | 4,464 | 4,464 |
| | Rockit Tube Equivalent (RTE) | | | 0 | 0 | 479,403 | 799,006 | 1,278,409 | 2,077,415 | 2,716,619 | 3,036,222 | 3,196,023 | 3,196,023 |
| | Total Pipfruit Income | | | $0 | $0 | $899,500 | $1,529,100 | $2,495,400 | $4,136,200 | $5,517,000 | $6,289,400 | $6,752,900 | $6,887,900 |
| | Current Year income | | | $0 | $0 | $540,000 | $920,000 | $1,500,000 | $2,480,000 | $3,310,000 | $3,770,000 | $4,050,000 | $4,130,000 |
| | Next Year Income | | | $0 | $0 | $360,000 | $610,000 | $1,000,000 | $1,650,000 | $2,210,000 | $2,520,000 | $2,700,000 | $2,760,000 |
| | FY Income | | | $0 | $0 | $899,500 | $1,529,100 | $2,495,400 | $4,136,200 | $5,517,000 | $6,289,400 | $6,752,900 | $6,887,900 |
| | Average OGR RTE Price | | | $0.00 | $0.00 | $1.88 | $1.91 | $1.95 | $1.99 | $2.03 | $2.07 | $2.11 | $2.16 |
| **Expenditure** | | | | | | | | | | | | | |
| | | | | ***Year 1*** | ***Year 2*** | ***Year 3*** | ***Year 4*** | ***Year 5*** | ***Year 6*** | ***Year 7*** | ***Year 8*** | ***Year 9*** | ***Year 10*** |
| Labour | Permanent staff | | | $172,500 | $234,600 | $239,292 | $244,078 | $248,959 | $253,939 | $259,017 | $264,198 | $269,482 | $274,871 |
| | Plant training/pruning | | | $40,625 | $124,313 | $169,065 | $172,446 | $175,895 | $222,472 | $245,222 | $250,126 | $255,129 | $260,231 |
| | Thinning | | | $93,750 | $95,625 | $195,075 | $198,977 | $202,956 | $256,699 | $282,948 | $288,607 | $294,379 | $300,267 |
| | Harvest Labour | | | $0 | $0 | $104,504 | $177,658 | $289,937 | $480,571 | $641,008 | $730,749 | $784,593 | $800,285 |
| | Other labour | | | $140,000 | $142,800 | $145,656 | $148,569 | $151,541 | $154,571 | $157,663 | $160,816 | $164,032 | $167,313 |
| Growing | Plant Protection | | | $68,750 | $105,188 | $143,055 | $145,916 | $148,834 | $188,246 | $207,495 | $211,645 | $215,878 | $220,196 |
| | Vehicles | | | $18,125 | $36,975 | $37,715 | $38,469 | $39,238 | $49,628 | $54,703 | $55,797 | $56,913 | $58,052 |
| | R & M | | | $3,500 | $8,925 | $23,669 | $37,142 | $37,885 | $47,917 | $52,817 | $53,873 | $54,951 | $56,050 |
| | Electricity | | | $7,313 | $9,754 | $11,705 | $11,939 | $12,177 | $15,402 | $16,977 | $17,316 | $17,663 | $18,016 |
| | Pollination | | | $0 | $0 | $8,778 | $11,342 | $12,177 | $15,402 | $16,977 | $17,316 | $17,663 | $18,016 |
| | Fertiliser | | | $16,250 | $21,675 | $26,010 | $26,530 | $27,061 | $34,227 | $37,726 | $38,481 | $39,251 | $40,036 |
| | Sundry growing costs | | | $12,188 | $16,256 | $19,508 | $19,898 | $20,296 | $25,670 | $28,295 | $28,861 | $29,438 | $30,027 |
| Overheads | General insurance | | | $18,750 | $19,125 | $29,261 | $39,795 | $40,591 | $51,340 | $56,590 | $57,721 | $58,876 | $60,053 |
| | Compliance | | | $2,250 | $10,328 | $15,216 | $20,296 | $24,355 | $30,804 | $33,954 | $34,633 | $35,326 | $36,032 |
| | Administration | | | $4,063 | $8,288 | $14,371 | $17,245 | $17,590 | $22,247 | $24,522 | $25,013 | $25,513 | $26,023 |
| | Rates | | | $8,750 | $8,925 | $9,104 | $9,286 | $9,471 | $11,979 | $13,204 | $13,468 | $13,738 | $14,012 |
| | Communication | | | $1,000 | $5,100 | $5,202 | $5,306 | $5,412 | $6,845 | $7,545 | $7,696 | $7,850 | $8,007 |
| | Lease | | | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Capital | Land & Improvements | | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Development | | $1,372,000 | $3,506,000 | $169,000 | $1,013,000 | $0 | $0 | $0 | $0 | $0 | | |
| | RTL Fees | | | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $0 | $0 | | |
| | Plant & Equipment | | | $320,000 | $325,000 | $735,000 | $213,000 | $0 | $0 | | | | |
| | Contigency | | | $0 | $0 | $500,000 | $0 | $0 | $0 | $0 | $0 | | |
| | Ammenities and Accomodation | | | $325,000 | $735,000 | $213,000 | $0 | $0 | $0 | $0 | $0 | | |
| Orchard Working Expenses | | | | $608,000 | $848,000 | $1,197,000 | $1,325,000 | $1,464,000 | $1,868,000 | $2,137,000 | $2,256,000 | $2,341,000 | $2,387,000 |
| **Total Expenditure** | | | **$1,372,000** | **$5,259,000** | **$2,577,000** | **$4,158,000** | **$2,037,900** | **$1,964,000** | **$2,368,000** | **$2,137,000** | **$2,256,000** | **$2,341,000** | **$2,387,000** |
| Growing Costs ($/ha) | | | | $24,320 | $33,920 | $47,880 | $53,000 | $58,560 | $74,720 | $85,480 | $90,240 | $93,640 | $95,480 |
| **Cashflow** | | | ($1,372,000) | ($5,259,000) | ($2,577,000) | ($3,258,500) | ($508,800) | $531,400 | $1,768,200 | $3,380,000 | $4,033,400 | $4,411,900 | $4,500,900 |
| **Depreciation (Dev,P&E)** | | | $0 | $169,163 | $535,356 | $572,195 | $687,476 | $618,728 | $556,856 | $501,170 | $451,053 | $405,948 | $365,353 |
| **Accumulated Cashflow** | | | ($1,372,000) | ($6,800,163) | ($9,912,520) | ($13,743,215) | ($14,939,491) | ($15,026,819) | ($13,815,475) | ($10,936,645) | ($7,354,298) | ($3,348,345) | $787,202 |
| **Cashflow (20 yr) XIRR** | | 15.0% | ($1,372,000) | ($5,428,163) | ($3,112,356) | ($3,830,695) | ($1,196,276) | ($87,328) | $1,211,344 | $2,878,830 | $3,582,347 | $4,005,952 | $4,135,547 |
| **Cashflow (15 yr) XIRR** | | 13.6% | ($1,372,000) | ($5,428,163) | ($3,112,356) | ($3,830,695) | ($1,196,276) | ($87,328) | $1,211,344 | $2,878,830 | $3,582,347 | $4,005,952 | $4,135,547 |
| **Cashflow (10 yr) XIRR** | | 9.1% | ($1,372,000) | ($5,428,163) | ($3,112,356) | ($3,830,695) | ($1,196,276) | ($87,328) | $1,211,344 | $2,878,830 | $3,582,347 | $4,005,952 | $16,433,655 |
| **Salvage Value** | | | ($13,720,000) | ($54,281,635) | ($54,281,635) | ($31,123,561) | $6,297,500 | $7,922,500 | $8,650,000 | $9,744,500 | $9,939,840 | $11,098,537 | $12,298,108 |

**Year 11 – Year 20**

| | | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Income** | ***Year end June*** | ***2036*** | ***2037*** | ***2038*** | ***2039*** | ***2040*** | ***2041*** | ***2042*** | ***2043*** | ***2044*** | ***2045*** |
| **Return level** | **Orchard Gate** | ***Year 11*** | ***Year 12*** | ***Year 13*** | ***Year 14*** | ***Year 15*** | ***Year 16*** | ***Year 17*** | ***Year 18*** | ***Year 19*** | ***Year 20*** |
| | Planted Area | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| | Gross Yield (tce) | 4,261,364 | 4,261,364 | 4,261,364 | 4,261,364 | 4,261,364 | 4,261,364 | 4,261,364 | 4,261,364 | 4,261,364 | 4,261,364 |
| | Rockit Bins | 4,464 | 4,464 | 4,464 | 4,464 | 4,464 | 4,464 | 4,464 | 4,464 | 4,464 | 4,464 |
| | Rockit Tube Equivalent (RTE) | 3,196,023 | 3,196,023 | 3,196,023 | 3,196,023 | 3,196,023 | 3,196,023 | 3,196,023 | 3,196,023 | 3,196,023 | 3,196,023 |
| | Total Pipfruit Income | $7,025,700 | $7,166,214 | $7,309,538 | $7,455,729 | $7,604,844 | $7,756,940 | $7,912,079 | $8,070,321 | $8,231,727 | $8,396,362 |
| | Current Year income | $4,220,000 | $4,300,000 | $4,390,000 | $4,470,000 | $4,560,000 | $4,650,000 | $4,750,000 | $4,840,000 | $4,940,000 | $5,040,000 |
| | Next Year Income | $2,810,000 | $2,870,000 | $2,920,000 | $2,980,000 | $3,040,000 | $3,100,000 | $3,160,000 | $3,230,000 | $3,290,000 | $3,360,000 |
| | FY Income | $7,025,700 | $7,166,214 | $7,309,538 | $7,455,729 | $7,604,844 | $7,756,940 | $7,912,079 | $8,070,321 | $8,231,727 | $8,396,362 |
| | Average OGR RTE Price | $2.20 | $2.24 | $2.29 | $2.33 | $2.38 | $2.43 | $2.48 | $2.53 | $2.58 | $2.63 |
| **Expenditure** | | | | | | | | | | | |
| | | ***Year 11*** | ***Year 12*** | ***Year 13*** | ***Year 14*** | ***Year 15*** | ***Year 16*** | ***Year 17*** | ***Year 18*** | ***Year 19*** | ***Year 20*** |
| Labour | Permanent staff | $280,369 | $285,976 | $291,696 | $297,530 | $303,480 | $309,550 | $315,741 | $322,056 | $328,497 | $335,067 |
| | Plant training/pruning | $265,436 | $270,745 | $276,160 | $281,683 | $287,317 | $293,063 | $298,924 | $304,903 | $311,001 | $317,221 |
| | Thinning | $306,272 | $312,398 | $318,646 | $325,019 | $331,519 | $338,149 | $344,912 | $351,811 | $358,847 | $366,024 |
| | Harvest Labour | $816,291 | $832,617 | $849,269 | $866,254 | $883,580 | $901,251 | $919,276 | $937,662 | $956,415 | $975,543 |
| | Other labour | $170,659 | $174,072 | $177,554 | $181,105 | $184,727 | $188,422 | $192,190 | $196,034 | $199,954 | $203,954 |
| Growing | Plant Protection | $224,600 | $229,092 | $233,674 | $238,347 | $243,114 | $247,976 | $252,936 | $257,994 | $263,154 | $268,417 |
| | Vehicles | $59,213 | $60,397 | $61,605 | $62,837 | $64,094 | $65,376 | $66,683 | $68,017 | $69,377 | $70,765 |
| | R & M | $57,171 | $58,314 | $59,481 | $60,670 | $61,884 | $63,121 | $64,384 | $65,671 | $66,985 | $68,324 |
| | Electricity | $18,376 | $18,744 | $19,119 | $19,501 | $19,891 | $20,289 | $20,695 | $21,109 | $21,531 | $21,961 |
| | Pollination | $18,376 | $18,744 | $19,119 | $19,501 | $19,891 | $20,289 | $20,695 | $21,109 | $21,531 | $21,961 |
| | Fertiliser | $40,836 | $41,653 | $42,486 | $43,336 | $44,203 | $45,087 | $45,988 | $46,908 | $47,846 | $48,803 |
| | Sundry growing costs | $30,627 | $31,240 | $31,865 | $32,502 | $33,152 | $33,815 | $34,491 | $35,181 | $35,885 | $36,602 |
| Overheads | General insurance | $61,254 | $62,480 | $63,729 | $65,004 | $66,304 | $67,630 | $68,982 | $70,362 | $71,769 | $73,205 |
| | Compliance | $36,753 | $37,488 | $38,237 | $39,002 | $39,782 | $40,578 | $41,389 | $42,217 | $43,062 | $43,923 |
| | Administration | $26,544 | $27,074 | $27,616 | $28,168 | $28,732 | $29,306 | $29,892 | $30,490 | $31,100 | $31,722 |
| | Rates | $14,293 | $14,579 | $14,870 | $15,168 | $15,471 | $15,780 | $16,096 | $16,418 | $16,746 | $17,081 |
| | Communication | $8,167 | $8,331 | $8,497 | $8,667 | $8,841 | $9,017 | $9,198 | $9,382 | $9,569 | $9,761 |
| | Lease | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Capital | Land & Improvements | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Development | | | | | | | | | | |
| | RTL Fees | | | | | | | | | | |
| | Plant & Equipment | | | | | | | | | | |
| | Contigency | | | | | | | | | | |
| | Ammenities and Accomodation | | | | | | | | | | |
| Orchard Working Expenses | | $2,435,000 | $2,484,000 | $2,534,000 | $2,584,000 | $2,636,000 | $2,689,000 | $2,742,000 | $2,797,000 | $2,853,000 | $2,910,000 |
| **Total Expenditure** | | **$2,435,000** | **$2,484,000** | **$2,534,000** | **$2,584,000** | **$2,636,000** | **$2,689,000** | **$2,742,000** | **$2,797,000** | **$2,853,000** | **$2,910,000** |
| Growing Costs ($/ha) | | $97,400 | $99,360 | $101,360 | $103,360 | $105,440 | $107,560 | $109,680 | $111,880 | $114,120 | $116,400 |
| **Cashflow** | | $4,590,700 | $4,682,214 | $4,775,538 | $4,871,729 | $4,968,844 | $5,067,940 | $5,170,079 | $5,273,321 | $5,378,727 | $21,739,767 |
| **Depreciation (Dev,P&E)** | | $328,818 | $295,936 | $266,342 | $239,708 | $215,737 | $194,164 | $174,747 | $157,272 | $141,545 | $127,391 |
| **Accumulated Cashflow** | | $5,049,084 | $9,435,362 | $13,944,558 | $18,576,579 | $23,329,686 | $28,203,463 | $33,198,795 | $38,314,843 | $43,552,025 | $65,164,402 |
| **Cashflow (20 yr) XIRR** | | $4,261,882 | $4,386,278 | $4,509,196 | $4,632,021 | $4,753,106 | $4,873,777 | $4,995,332 | $5,116,048 | $5,237,182 | $21,612,377 |
| **Cashflow (15 yr) XIRR** | | $4,261,882 | $4,386,278 | $4,509,196 | $4,632,021 | $19,470,301 | | | | | |
| **Cashflow (10 yr) XIRR** | | | | | | | | | | | |
| **Salvage Value** | | $12,861,070 | $13,419,941 | $14,144,740 | $14,427,985 | $14,717,194 | $15,012,388 | $15,313,586 | $15,620,808 | $15,934,074 | $16,253,405 |

| | | | | |
|---|---|---|---|---|
| **NPV** | **$12,985,970** | | | |
| **Salvage Value** | | 10% | based on % of annual EBITDA | |
| | | | loan | profits |
| **MIRR (15 years)** | **11.6%** | | 10.0% | 7.0% |

**PROPERTY DEVELOPMENT** **2025**

**Scenario** ***Leslie Hills redevelop Site B to Rockit***

| PROPERTY AREA | Total Orchard Land | Mature planted |
|---|---|---|
| | 25 ha | 25 ha |

| PURCHASE - LAND | $0 |
|---|---|

| | | | | | | | Spacing | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **SCENARIO (Ha)** | Total | 2024/25 | 2025/26 | 2026/27 | 2025/26 | 2026/27 | Row | Tree | Density | Total |
| Rockit 2D CG202 | 25.0 | 0.0 | 25.0 | 0.0 | 0.0 | 0.0 | 2.6 | 1.5 | 2,564 | 64,103 |
| | 25.0 | 0.0 | 25.0 | 0.0 | 0.0 | 0.0 | | | | 64,103 |

**LAND PREPARATION**

***Land Contouring/Tracks***

| | | 2024/25 | 2025/26 | 2026/27 | 2025/26 | 2026/27 | Total |
|---|---|---|---|---|---|---|---|
| Type | Contouring/Tracks | 0% | 100% | 0% | 0% | 0% | 25 ha |
| Cost | $5,000 /ha | $0 | $125,000 | $0 | $0 | $0 | $125,000 |

***Soil Modification***

| | | 2024/25 | 2025/26 | 2026/27 | 2025/26 | 2026/27 | Total | |
|---|---|---|---|---|---|---|---|---|
| Type | Gypsum/Fertiliser | 0% | 100% | 0% | 0% | 0% | 25 ha | |
| Cost | $3,000 /ha | $0 | $75,000 | $0 | $0 | $0 | $75,000 | Excl application |

| | | | | | | |
|---|---|---|---|---|---|---|
| ***Summary Preparation*** | $200,000 | $0 | $200,000 | $0 | $0 | $0 |

**DEVELOPMENT**

| | | $ Total | | | | | |
|---|---|---|---|---|---|---|---|
| | Total | 2024/25 | 2025/26 | 2026/27 | 2025/26 | 2026/27 | |
| ***Structures*** | | | | | | | |
| Rockit 2D CG202 | $135,000 | $0 | $3,375,000 | $0 | $0 | $0 | h hail net, incl installation |
| **TOTAL STRUCTURES** | $3,375,000 | $0 | $3,375,000 | $0 | $0 | $0 | |

| | | Year 0 | Year 1 | Year 2 | Year 3 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Structures expenditure staging*** | | 15% | 50% | 5% | 30% | | | | | |
| | Total | 2024/25 | 2025/26 | 2026/27 | 2025/26 | 2026/27 | 2030/31 | 2031/32 | 2032/33 | 2033/34 |
| ***Summary Structures*** | $3,375,000 | $506,250 | $1,687,500 | $168,750 | $1,012,500 | $0 | $0 | | | |

| | | Year 0 | Year 1 | Year 2 | Year 3 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Tree expenditure staging*** | | 50% | 50% | 0% | 0% | | | | | |
| ***Trees*** | Total | 2024/25 | 2025/26 | 2026/27 | 2025/26 | 2026/27 | 2030/31 | 2031/32 | 2032/33 | 2033/34 |
| Rockit 2D CG202 | 64,103 | 0 | 64,103 | 0 | 0 | 0 | | | | |
| ***Tree Cost*** | $27.00 /tree | $865,385 | $865,385 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| ***Planting/Grafting*** | $2.00 /tree | $0 | $128,205 | $0 | $0 | $0 | | | | |
| ***Cultivate, Mark out*** | $2,000 /ha | $0 | $50,000 | $0 | $0 | $0 | | | | |
| ***Summary Planting*** | $1,908,974 | $865,385 | $1,043,590 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| ***Variety Licence (RTL fees)*** | $100,000 | $0 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $0 | $0 | |

***Irrigation***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Water Source | | | | | | | Total | |
| Well Upgrades | If required | 0% | 100% | 0% | 0% | | 25 | |
| | $5,000 /ha | $0 | $125,000 | $0 | $0 | | $125,000 | incl installation |
| New Development | Microsprinkler | 0% | 100% | 0% | | | 25 ha | |
| Cost | $12,000 /ha | $0 | $300,000 | $0 | $0 | $0 | $300,000 | incl installation |

***Irrigation Mains***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Required? | Yes | | | | | | Total | |
| Type | Mains/ Submains | | | | | | 25 | Assumes existing pump |
| Cost | $6,000 /ha | $0 | $150,000 | $0 | $0 | $0 | $150,000 | incl installation |

| | | | | | | |
|---|---|---|---|---|---|---|
| ***Summary Irrigation*** | $575,000 | $0 | $575,000 | $0 | $0 | $0 |

| | Total | 2024/25 | 2025/26 | 2026/27 | 2025/26 | 2026/27 | 2030/31 | 2031/32 | 2032/33 |
|---|---|---|---|---|---|---|---|---|---|
| **TOTAL LAND COSTS** | $0 | $0 | | | | | | | |
| **TOTAL DEVELOPMENT COSTS** | $6,058,974 | $1,371,635 | $3,506,090 | $168,750 | $1,012,500 | $0 | $0 | $0 | $0 |
| **PLANT & EQUIPMENT ORCHARD** | $1,592,500 | $320,000 | $325,000 | $735,000 | $212,500 | $0 | | | |
| **TOTAL RTL FEES** | $2,500,000 | $0 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $0 | $0 |
| **CONTIGENCY** | $500,000 | | | | $500,000 | | | | |
| **BUILDINGS** | $2,100,000 | $0 | $0 | $1,500,000 | $600,000 | $0 | | | |

## Expenses / Cashflow

| | | | Rockit | *2025/26* | *2026/27* | *2027/28* | *2028/29* | *2029/30* | *2030/31* | *2031/32* | *2032/33* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Labour | Permanent staff | (total) | $230,000 | 75% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | Plant training/pruning | $/ha | $6,500 | 25% | 75% | 100% | 100% | 100% | 100% | 100% | 100% |
| | Thinning | $/ha | $7,500 | 50% | 50% | 100% | 100% | 100% | 100% | 100% | 100% |
| | Harvest Labour | $/bin | $150 | 0% | 0% | 15% | 25% | 40% | 65% | 85% | 100% |
| | Other labour | $/ha | $5,600 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | | | | | | | | | | |
| Growing | Plant Protection | $/ha | $5,500 | 50% | 75% | 100% | 100% | 100% | 100% | 100% | 100% |
| | Vehicles | $/ha | $1,450 | 50% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | R & M | $/ha | $1,400 | 10% | 25% | 65% | 100% | 100% | 100% | 100% | 100% |
| | Electricity | $/ha | $450 | 65% | 85% | 100% | 100% | 100% | 100% | 100% | 100% |
| | Pollination | $/ha | $450 | 0% | 0% | 75% | 95% | 100% | 100% | 100% | 100% |
| | Fertiliser | $/ha | $1,000 | 65% | 85% | 100% | 100% | 100% | 100% | 100% | 100% |
| | Sundry growing costs | $/ha | $750 | 65% | 85% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | | | | | | | | | | |
| Overheads | General insurance | | $1,500 | 50% | 50% | 75% | 100% | 100% | 100% | 100% | 100% |
| | Compliance | | $900 | 10% | 45% | 65% | 85% | 100% | 100% | 100% | 100% |
| | Administration | | $650 | 25% | 50% | 85% | 100% | 100% | 100% | 100% | 100% |
| | Rates | | $350 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | Communication | | $200 | 20% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | Lease | | [redacted] | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

## PRODUCTION

| | | |
|---|---|---|
| Bin weight (Rockit) | 420 | kg |
| RTE | 0.440 | kg |

| *Crop* | *Gross Yield (RTE/ha)* | *Proportion of Planted Area* | *Area (ha)* | *Class I packout* | *Class I yield (RTE)* | *Class I Price (RTE)* | *Class II /Reject price* | *Target Ave Size* | Tonnes /ha | Bins /ha |
|---|---|---|---|---|---|---|---|---|---|---|
| Rockit 2D CG202 2025 | 170,455 | 100% | 25.0 | 75% | 127,841 | $1.75 | $0.16 | 205 | 75 | 179 |
| | | | 25.0 | | | | | | | |

| YIELD ACCUMULATION | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|
| *Crop* | ***Year 1*** | ***Year 2*** | ***Year 3*** | ***Year 4*** | ***Year 5*** | ***Year 6*** | ***Year 7*** | ***Year 8*** | ***Year 9*** | ***Year 10*** |
| Rockit 2D CG202 2025 | 0% | 0% | 15% | 25% | 40% | 65% | 85% | 95% | 100% | 100% |

GROSS YIELD

| *Crop* | ***Year 1*** | ***Year 2*** | ***Year 3*** | ***Year 4*** | ***Year 5*** | ***Year 6*** | ***Year 7*** | ***Year 8*** | ***Year 9*** | ***Year 10*** |
|---|---|---|---|---|---|---|---|---|---|---|
| Rockit 2D CG202 2025 | 0 | 0 | 639,205 | 1,065,341 | 1,704,545 | 2,769,886 | 3,622,159 | 4,048,295 | 4,261,364 | 4,261,364 |

CLASS I YIELD

| *Crop* | ***Year 1*** | ***Year 2*** | ***Year 3*** | ***Year 4*** | ***Year 5*** | ***Year 6*** | ***Year 7*** | ***Year 8*** | ***Year 9*** | ***Year 10*** |
|---|---|---|---|---|---|---|---|---|---|---|
| Rockit 2D CG202 2025 | 0 | 0 | 479,403 | 799,006 | 1,278,409 | 2,077,415 | 2,716,619 | 3,036,222 | 3,196,023 | 3,196,023 |

CLASS II YIELD

| *Crop* | ***Year 1*** | ***Year 2*** | ***Year 3*** | ***Year 4*** | ***Year 5*** | ***Year 6*** | ***Year 7*** | ***Year 8*** | ***Year 9*** | ***Year 10*** |
|---|---|---|---|---|---|---|---|---|---|---|
| Rockit 2D CG202 2025 | 0 | 0 | 159,801 | 266,335 | 426,136 | 692,472 | 905,540 | 1,012,074 | 1,065,341 | 1,065,341 |

## LABOUR, MACHINERY & AMMENITIES

### PERMANANT LABOUR

| | *Year 1* | *Year 2* | *Year 3* | *Year 4* | *Year 5* | *Year 6* | Number |
|---|---|---|---|---|---|---|---|
| Manager | $105,000 | $105,000 | $105,000 | $105,000 | $105,000 | $105,000 | 1 |
| Assistant Manager | | $75,000 | $75,000 | $75,000 | $75,000 | $75,000 | 1 |
| Foreperson/Leading hands | | $50,000 | $50,000 | $50,000 | $50,000 | $50,000 | 1 |
| **Total Permanent Labour - not inc. waged staff** | **$105,000** | **$230,000** | **$230,000** | **$230,000** | **$230,000** | **$230,000** | 3 |
| | | | | | | | |
| *Permanent Labour Cost per ha* | *$4,200* | *$9,200* | *$9,200* | *$9,200* | *$9,200* | *$9,200* | |

### SEASONAL LABOUR

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Casual Labour Rates* | $28 | /hr | | | | | | | | | | | |
| | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | Total |
| *Casual hours required (%) - excludes waged permnt. Staff* | 3% | 3% | 7% | 7% | 7% | 5% | 40% | 17% | 3% | 3% | 3% | 3% | 100% |
| *Casual hours required* | 857 | 857 | 2,399 | 2,399 | 2,399 | 1,714 | 13,711 | 5,827 | 1,028 | 1,028 | 1,028 | 1,028 | 34,276 |
| *Casual staff required (45hr week)* | 4 | 4 | 12 | 12 | 12 | 9 | 69 | 29 | 5 | 5 | 5 | 5 | 69 |

### MACHINERY

| | *Year 1* | *Year 2* | *Year 3* | *Year 4* | *Year 5* | *Year 6* | | Number | each | ha per |
|---|---|---|---|---|---|---|---|---|---|---|
| Tractor: 100hp 2wd cab & front forklifts | $90,000 | $90,000 | $0 | $0 | $0 | | | 2 | $90,000 | 13 |
| Tractor: 80hp 2wd cab & front forklifts | | | $80,000 | $0 | $0 | | | 1 | $80,000 | 25 |
| Platform | $0 | $110,000 | $110,000 | | | | | 2 | $110,000 | 13 |
| Sprayer - 6 MO at 130k each, 3x single row at 75k | $85,000 | $85,000 | $0 | | | | | 2 | $85,000 | 13 |
| Mower | $15,000 | $0 | $0 | $0 | | | | 1 | $15,000 | 25 |
| Frost fans | | | $500,000 | $0 | | | | 4 | $125,000 | 7 |
| Mulcher | | $20,000 | | | | | | 1 | $20,000 | 25 |
| Load floaters/Bin shifters -150 k | $0 | $0 | $25,000 | $0 | $0 | | | 2 | $12,500 | 13 |
| | | | | | | | | | | |
| Reflective cloth | | $0 | $0 | $212,500 | $0 | $0 | | 25 | $8,500 | 25 |
| Other eg. Fertiliser spreader, hydra laddas, moisture probes etc | $20,000 | $20,000 | $20,000 | | | | | 1 | | |
| Vehicles (1 Mgrs, 1x Orchard) | $85,000 | | | | | | | | | |
| RSE/Worker Vans | $25,000 | | | | | | | | | |
| Total Machinery | **$320,000** | **$325,000** | **$735,000** | **$212,500** | **$0** | **$0** | $1,592,500 | | | |
| | | | | | | | | | | |

### BUILDINGS

| | | | | | | |
|---|---|---|---|---|---|---|
| Accommodation | $0 | | | | | |
| 50 bed | | | $1,500,000 | $500,000 | | |
| Backpacker park | | | $0 | $100,000 | | |
| | | | | $0 | | |
| **Total Ammenities** | **$0** | **$0** | **$1,500,000** | **$600,000** | **$0** | **$0** |

## Valuation

Estimated Market Value of Rockit excl license only land +bio using Boyd Gross methodology

| year end | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year 0 | $247,000 | $251,900 | $256,900 | $262,000 | $267,200 | $272,500 | $278,000 | $283,600 | $289,300 | $295,100 | $301,000 | $307,000 | $313,100 | $319,400 | $325,800 | $332,300 | $338,900 | $345,700 | $352,600 | $359,700 | $366,900 | $374,200 |
| Year 1 | $247,000 | $251,900 | $256,900 | $262,000 | $267,200 | $272,500 | $278,000 | $283,600 | $289,300 | $295,100 | $301,000 | $307,000 | $313,100 | $319,400 | $325,800 | $332,300 | $338,900 | $345,700 | $352,600 | $359,700 | $366,900 | $374,200 |
| Year 2 | $281,000 | $286,600 | $292,300 | $298,100 | $304,100 | $310,200 | $316,400 | $322,700 | $329,200 | $335,800 | $342,500 | $349,400 | $356,400 | $363,500 | $370,800 | $378,200 | $385,800 | $393,500 | $401,400 | $409,400 | $417,600 | $426,000 |
| Year 3 | $315,000 | $321,300 | $327,700 | $334,300 | $341,000 | $347,800 | $354,800 | $361,900 | $369,100 | $376,500 | $384,000 | $391,700 | $399,500 | $407,500 | $415,700 | $424,000 | $432,500 | $441,200 | $450,000 | $459,000 | $468,200 | $477,600 |
| Year 4 | $349,000 | $356,000 | $363,100 | $370,400 | $377,800 | $385,400 | $393,100 | $401,000 | $409,000 | $417,200 | $425,500 | $434,000 | $442,700 | $451,600 | $460,600 | $469,800 | $479,200 | $488,800 | $498,600 | $508,600 | $518,800 | $529,200 |
| Year 5 | $360,000 | $367,200 | $374,500 | $382,000 | $389,600 | $397,400 | $405,300 | $413,400 | $421,700 | $430,100 | $438,700 | $447,500 | $456,500 | $465,600 | $474,900 | $484,400 | $494,100 | $504,000 | $514,100 | $524,400 | $534,900 | $545,600 |
| Year 6 | $370,000 | $377,400 | $384,900 | $392,600 | $400,500 | $408,500 | $416,700 | $425,000 | $433,500 | $442,200 | $451,000 | $460,000 | $469,200 | $478,600 | $488,200 | $498,000 | $508,000 | $518,200 | $528,600 | $539,200 | $550,000 | $561,000 |
| Year 7 | $385,000 | $392,700 | $400,600 | $408,600 | $416,800 | $425,100 | $433,600 | $442,300 | $451,100 | $460,100 | $469,300 | $478,700 | $488,300 | $498,100 | $508,100 | $518,300 | $528,700 | $539,300 | $550,100 | $561,100 | $572,300 | $583,700 |
| Year 8 | $385,000 | $392,700 | $400,600 | $408,600 | $416,800 | $425,100 | $433,600 | $442,300 | $451,100 | $460,100 | $469,300 | $478,700 | $488,300 | $498,100 | $508,100 | $518,300 | $528,700 | $539,300 | $550,100 | $561,100 | $572,300 | $583,700 |
| Year 9 | $385,000 | $392,700 | $400,600 | $408,600 | $416,800 | $425,100 | $433,600 | $442,300 | $451,100 | $460,100 | $469,300 | $478,700 | $488,300 | $498,100 | $508,100 | $518,300 | $528,700 | $539,300 | $550,100 | $561,100 | $572,300 | $583,700 |
| Year 10 | $385,000 | $392,700 | $400,600 | $408,600 | $416,800 | $425,100 | $433,600 | $442,300 | $451,100 | $460,100 | $469,300 | $478,700 | $488,300 | $498,100 | $508,100 | $518,300 | $528,700 | $539,300 | $550,100 | $561,100 | $572,300 | $583,700 |

| SCENARIO (Ha) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land only | | | | | | | | | | | | | | | | | | | | | | |
| Rockit 2D CG202 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

## Valuation Summary

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Only | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Rockit 2D CG202 | $6,175,000 | $6,297,500 | $6,422,500 | $6,550,000 | $7,602,500 | $7,755,000 | $8,870,000 | $10,025,000 | $10,542,500 | $11,055,000 | $11,732,500 | $11,967,500 | $12,207,500 | $12,452,500 | $12,702,500 | $12,957,500 | $13,217,500 | $13,482,500 | $13,752,500 | $14,027,500 | $14,307,500 | $14,592,500 |
| Accommodation | $0 | $0 | $1,500,000 | $2,100,000 | $2,142,000 | $2,184,840 | $2,228,537 | $2,273,108 | $2,318,570 | $2,364,941 | $2,412,240 | $2,460,485 | $2,509,694 | $2,559,888 | $2,611,086 | $2,663,308 | $2,716,574 | $2,770,905 | $2,826,324 | $2,882,850 | $2,940,507 | $2,999,317 |
| Total | $6,175,000 | $6,297,500 | $7,922,500 | $8,650,000 | $9,744,500 | $9,939,840 | $11,098,537 | $12,298,108 | $12,861,070 | $13,419,941 | $14,144,740 | $14,427,985 | $14,717,194 | $15,012,388 | $15,313,586 | $15,620,808 | $15,934,074 | $16,253,405 | $16,578,824 | $16,910,350 | $17,248,007 | $17,591,817 |