



## EASTERBO MIXED USE

### Case Study

#### INTRODUCTION

The Easterbo mixed use case study summary is one of a series produced by Water Wairarapa to inform the farming community of land use options available in Wairarapa through the supply of reliable, pressurised water to the farm gate.

It describes a theoretical conversion of the existing Easterbo dryland farming system to an irrigated, mixed-use farm that includes arable, specialist seeds and livestock finishing. The current farming operation is located in East Taratahi near Carterton and is described in full in the accompanying 'Easterbo Overview'.

The information contained in this case study is the summary of a report prepared by industry consultants BakerAg. It is based on a set of assumptions (outlined below) and is one of many possible scenarios on offer for this property.

When considering the decision to irrigate or not, many factors need to be considered including financial, environmental, management, peace of mind (risk mitigation), succession planning and a willingness to embrace change. This case study only broadly considers the first three factors.

#### ASSUMPTIONS

The table below compares the existing dryland farming operation against what is considered an optimised configuration (on this land class) of arable, specialist seeds and livestock finishing enterprises. The irrigated scenarios include production levels achieved by both an Average Efficient Operator and a Top 10% Operator.

	Baseline Dryland Model	Irrigated Average Efficient Operator	Irrigated Top 10% Operator
<b>Cropping on irrigated heavy soils</b>	140ha heavy soils	96ha of irrigated heavy soils 44ha of dryland heavy soils	96ha of irrigated heavy soils 44ha of dryland heavy soils
<b>Cropping on stones</b>	35ha stones	35ha stones	35ha stones
<b>Stock numbers</b>	4,550 lambs 160 bulls 500 ewe hoggets	5,900 lambs 500 ewe hoggets 150 dairy cows	6,900 lambs 600 ewe hoggets 150 dairy cows

#### Key Assumptions:

- 96ha irrigated using 3,528m<sup>3</sup> of water/ha, representing 56% of Easterbo's 175.4 ha effective area.
- Crops grown include: barley (12ha); peas (12ha); pak choi seed (12ha); red clover seed (24ha); and ryegrass seed (12ha).
- A Top 10% arable operator achieves higher crop yields through superior husbandry techniques and timing.
- A Top 10% livestock operator achieves higher pasture production and utilisation through superior grazing management and increased stock growth rates.
- Improved pasture yields enable more stock to be traded. Stock is on the farm for less time and consumes a lower percentage of the farm's total annual dry matter production.



## FINANCIAL VIABILITY

The following table provides a comparative insight into financial viability at a Gross Margin level (Gross Farm Revenue less Farm Working Expenses).

Farm Surplus (Gross Margin less the cost of water, depreciation and interest) will be dependent on the ultimate cost of water, depreciation and capital structure adopted per farm. Farm Surplus shown below does not include the cost of water and uses an approximation for depreciation and interest expenses.

Gross Margin	Baseline Dryland		Irrigated Average		Irrigated Top 10%	
	\$ Total	\$ / eff ha	\$ Total	\$ / eff ha	\$ Total	\$ / eff ha
Gross Farm Revenue	271,301	1,547	713,162	4,066	791,844	4,515
Farm Working Expenses	(178,074)	(1,015)	(426,032)	(2,429)	(426,524)	(2,432)
<b>Gross Margin</b>	<b>93,227</b>	<b>532</b>	<b>287,130</b>	<b>1,637</b>	<b>365,320</b>	<b>2,083</b>

Farm Surplus (pre-water)	Baseline Dryland		Irrigated Average		Irrigated Top 10%	
	\$ Total	\$ / eff ha	\$ Total	\$ / eff ha	\$ Total	\$ / eff ha
Gross Margin	93,227	532	287,130	1,637	365,320	2,083
Depreciation	-	-	(63,873)	(364)	(63,873)	(364)
Interest expense	(2,000)	(11)	(35,695)	(204)	(24,166)	(138)
<b>Farm Surplus (pre-water)</b>	<b>91,227</b>	<b>520</b>	<b>187,562</b>	<b>1,069</b>	<b>277,281</b>	<b>1,581</b>

## CAPITAL

Easterbo's shape and size means the cost of irrigation infrastructure is relatively low; a large area can be covered with a single pivot rotating 360°. It also highlights the fact that every property is unique and that an irrigation assessment requires a farm-by-farm analysis.

All per hectare figures are calculated across the entire 175.4ha effective area at 'a point in time'; it is one example of what can be achieved with the supply of reliable water. Further, it may take 2-3 years to achieve these results.

Capital expenditure	\$
Pivot irrigator (96ha)	254,559
Consents	15,000
Fencing shelter belts	98,300
Laneway	34,300
Stock water	39,800
Livestock	(77,000)
Machinery (optional)	360,000
<b>Total</b>	<b>724,959</b>

## KEY SENSITIVITIES

Shown below is the gross margin (per hectare) assuming a +/- 10% movement in crop price, yield, and farm working expenditure.

Sensitivity to crop price and yield	-10%	-5%	0%	5%	10%
Irrigated Average	1,082	1,257	1,432	1,607	1,782
Irrigated Top 10%	1,696	1,889	2,083	2,276	2,470

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Increased certainty provided by irrigation is more likely to deliver higher production levels, increasing the probability of higher farm surpluses on a sustainable basis.

## IRRIGATION INSIGHTS

The decision to irrigate involves many factors including economic, risk mitigation, and personal and family considerations. Insights from irrigation schemes in other regions include:

- Irrigation increases certainty. Farmers have more confidence in planning decisions and budgeting by removing the one variable they have the least control over, the climate.
- Water is an enabler. It provides opportunities, including new land uses and the ability to profit from seasonal pricing cycles and market volatility.
- Irrigation reduces production volatility. A farmer with irrigation in a dryland farming area is a lesser credit risk to lenders.
- Water improves an entire farming business, not just the irrigated footprint. Beyond reducing the risk profile and improving profitability, farmers who have successfully used irrigation tend to become more sophisticated farmers that typically grow their businesses through acquiring additional land.
- The decision to irrigate cannot be based solely on profitability. It is important to consider other economic factors to which a dollar amount is difficult to assign. These include reduction in operating risk, reduced production volatility, becoming a better credit risk, and more opportunities.
- The economic and social benefits of irrigation are far-reaching. It revives rural communities by providing new employment opportunities which attract new (often younger) families to the district.

## ENVIRONMENTAL IMPACTS

Intensifying a farming operation increases the risk of adverse environmental impacts. The extent of these risks will depend on the farm's physical characteristics, most of which can be mitigated through proactive management on-farm.

Good Management Practice (GMP) is addressed through the development of a Farm Environment Plan. GMP is an environmental risk-management tool that assists farmers recognise and mitigate on-farm environmental risks.

For Easterbo, the following are examples of management practices that could be put in place in a Farm Environment Plan for the Mixed Use scenario.

### Nutrient loss mitigation

- Regular soil testing to monitor nutrient levels and assist in developing fertiliser plans.
- Avoid waterways when spreading fertiliser.
- Applying nitrogen at a rate and at a time that maximises uptake by pastures and crops.
- Matching fertiliser inputs to crop needs (a crop nutrient budget).

### Stocking policy

- Grazing dairy cows through winter on crops in the stony country.
- The remaining stock policy is around lamb finishing, the animal with the lowest nitrogen leaching risk which is least likely to damage soil structure.
- Good cattle wintering practices such as break-feeding from the top of a slope down and excluding access to waterways.

### Preventing soil damage

- Wintering cattle on the stony soils to preserve the soil structure of the heavier soils.

- Use of direct drilling (Cross Slot) rather than conventional cultivation to preserve the structural integrity of the topsoil. Minimum tillage reduces surface wash and wind erosion and conserves soil moisture. It also reduces the water requirement.

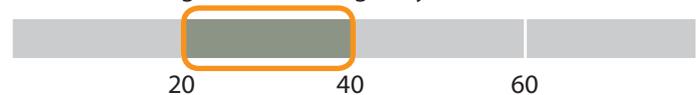
## INDICATIVE NUTRIENT LOSSES

Based on the OVERSEER® Nutrient Budget Model, the indicative nutrient losses for Easterbo as the mixed used operation used in this scenario are shown in the following charts.

Indicative Phosphorous (P) losses Kg/ha/year



Indicative Nitrogen (N) losses Kg/ha/year



## CONCLUSION

Conversion from current land use to a mixed operation under irrigation results in increased and reliable pasture and crop production. These conversions have the potential to produce more intensive and higher-value farming systems.

The greatest advantage of cash cropping is that it eliminates crop failures while increasing crop yields. Irrigation helps to establish annual grasses earlier, giving the farmer confidence to buy stock earlier in the autumn when prices are lower which leads to greater trading margins. Other benefits of this farming system include increases in total pasture production (+21 to +34%) and more animals traded, more reliable summer production, and varied trading opportunities.

## MANAGEMENT & LIFESTYLE

It is well-documented that moving to a successful irrigated mixed farming operation from a dryland livestock operation requires upskilling. It will also require management and associated lifestyle changes for the property owner. This transition and the associated investment (in both infrastructure and upskilling) will be rewarded with higher levels of sustainable farm surpluses.

Upskilling in cash cropping, particularly higher-value crops such as brassica seed or sweet corn will take time. Many new irrigators lease ground to proven operators in the district during the early years to learn and develop best practice techniques before undertaking it themselves.

### Management considerations

- Managing and overseeing an on farm irrigation development project.
- Transitioning changes to the farm systems to include multiple high value, high-risk crops.
- Matching crops with soil type and micro climates.
- Selecting which crops for which rotation.
- Owning and operating specialised machinery vs contracting.

### Labour considerations

- Securing a seasonal work force that may be required to work long hours around planting and harvesting.
- Relatively intensive winters with large numbers of cattle on feed breaks.

### THIS CASE STUDY SERIES

This case study is one of a series of land use scenarios tested on Easterbo and two other Wairarapa properties. The full series is:

#### Elm Grove

Dairy Conversion  
Apple Orchard  
Mixed Operation

#### Easterbo

Sheep Dairy  
*Mixed Operation*  
Livestock Finishing

#### Otahuao

Sheep Dairy  
Mixed Operation

For details of these options go to:

[www.wairarapawater.org.nz](http://www.wairarapawater.org.nz)

## YOUR FEEDBACK IS NEEDED

This case study and the others in this series are designed to assist farmers answer an important survey in mid-2016 that will influence the proposed water storage scheme's feasibility and ownership structure.

The survey will not seek any form of commitment. However it will ask farmer participants to indicate their interest in any future irrigation scheme so that they have the option to access stored water in the future.

## KEEP IN TOUCH

Send your email address to [greg.ordish@gw.govt.nz](mailto:greg.ordish@gw.govt.nz) and we'll keep you updated on developments.

## WHO CAN HELP

This information is intended to provide a starting point for consideration of individual situations. It covers just one scenario – conversion of the existing operation to irrigated mixed farming.

For the detailed report contact Greg Ordish who is available to work alongside you to answer questions, and provide information and experience from other areas.

Phone or text Greg Ordish on **06 826 1513** or **021 667 609**.

### Other useful sources of information:

Talk to your banker, accountant or farm advisor - we are also working with them.

Talk to the Wairarapa Water Users Society.

[www.far.org.nz](http://www.far.org.nz)

[www.beefandlambnz.com](http://www.beefandlambnz.com)

[www.dairynz.co.nz](http://www.dairynz.co.nz)

[www.irrigationnz.co.nz](http://www.irrigationnz.co.nz)

[www.smartirrigation.co.nz](http://www.smartirrigation.co.nz)