Water Wairarapa

EASTERBO LIVESTOCK FINISHING

Case Study

INTRODUCTION

The Easterbo livestock finishing case study summary is one of a series produced by Water Wairarapa to inform the farming community of the 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 livestock finishing farm. 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 the 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 broadly considers only the first three factors.

ASSUMPTIONS

The table below compares the existing dryland farming operation with an irrigated livestock finishing operation. 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
Cropping rotation on heavy soils	140ha of heavy soils: plantain, ryegrass clover, high quality hay	96ha of irrigated heavy soils: brassica, plantain, ryegrass clover 44ha of dryland heavy soils: plantain, ryegrass clover, high quality hay	96ha of irrigated heavy soils: brassica, plantain, ryegrass clover 44ha of dryland heavy soils: plantain, ryegrass clover, high quality hay
Cropping rotation on stones	35ha of stones: greenfeed oats	35ha of stones: greenfeed oats	35ha of stones: greenfeed oats
Stock numbers	4,550 lambs - traded 500 ewe hoggets - grazed 160 bulls - finished	5,800 lambs - traded 250 weaner bulls - finished	6,200 lambs - traded 300 weaner bulls - finished

Key Assumptions:

- 96ha irrigated using 4,079m^3 of water/ha, representing 56% of Easterbo's 175.4ha effective area.
- The Top 10% operator achieves higher pasture yield and utilisation through better grazing management and increased stock growth rates. These factors combine to improve production by being able to trade more animals. Stock are on the farm for less time and consume a lower percentage of the farm's total annual dry matter production.
- Irrigation results in greater pasture yield and, more importantly, guaranteed pasture yield with consistently high-quality feed throughout summer. A younger class of cattle can be finished which is more efficient.

FINANCIAL VIABILITY

The following tables provide a comparative insight into financial viability at a Gross Margin level (Gross Farm Revenue less Farm Working Expenses) and Farm Surplus (Gross Margin less depreciation and interest).

The Average Efficient Operator and Top 10% Operator scenarios are compared against the regional average for this type of property, referred to as 'Baseline Dryland' developed using the Farmax feed budgeting tool.

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	370,834	2,114	436,928	2,491
Farm Working Expenses	(178,074)	(1,015)	(245,681)	(1,401)	(246,977)	(1,408)
Gross Margin	**93,227**	**532**	**125,153**	**714**	**189,951**	**1,083**

Gross Margin determines the cash surplus available to service farm debt, including the incremental increase in debt servicing costs and depreciation associated with developing on-farm irrigation infrastructure.

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 (pre-water)	Baseline Dryland		Irrigated Average		Irrigated Top 10%	
	$ Total	$ / eff ha	$ Total	$ / eff ha	$ Total	$ / eff ha
Gross Margin	93,227	532	125,153	714	189,951	1,083
Depreciation	-	-	(18,843)	(107)	(18,843)	(107)
Interest expense	(2,000)	(11)	(28,190)	(161)	(19,833)	(113)
Farm Surplus (pre-water)	**91,227**	**520**	**78,120**	**445**	**151,275**	**862**

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 (96 ha)	254,559
Consents	15,000
Fencing shelter belts	82,000
Laneway	34,300
Stock water	31,800
Livestock	43,000
Total	**460,659**
Total per hectare	**2,626**

KEY SENSITIVITIES

Shown below is the Gross Margin (per hectare) assuming a -/+ 10% movement in beef and lamb prices, and farm working expenditure.

Sensitivity to beef & lamb prices	-10%	-5%	0%	5%	10%
Irrigated Average	369	541	714	886	1,057
Irrigated Top 10%	767	924	1,083	1,244	1,399

Sensitivity to farm working expenditure	-10%	-5%	0%	5%	10%
Irrigated Average	938	826	714	601	489
Irrigated Top 10%	1,260	1,171	1,083	995	906

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 around 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 represents 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 transition into more sophisticated farmers that typically grow their business though 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 to 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 a livestock finishing scenario.

Nutrient loss mitigation

- Regular soil testing to monitor nutrient levels and assist in developing fertiliser plans.
- Avoiding waterways when spreading fertiliser.
- Applying nitrogen at a rate and at a time that maximises uptake by pastures.
- Maintaining soil moisture within a tight band, in between wilting point and field capacity, in order to optimise growth and minimise nutrient leaching.

Stock Policy

- The stocking policy assumed includes wintering bull calves on the stony country. This smallest, lightest class of cattle minimises risk of nitrogen leaching and soil structure damage.
- 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.

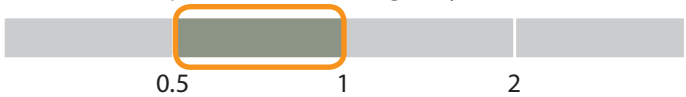
Preventing soil damage

- 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.
- Careful grazing management to minimise pugging and runoff of silt containing phosphates especially with high intensity cattle grazing in winter.

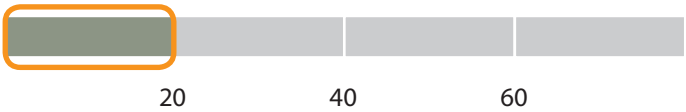
INDICATIVE NUTRIENT LOSSES

Based on the OVERSEER® Nutrient Budget Model, the indicative nutrient losses for Easterbo as a livestock finishing operation are shown in the following charts.

Indicative Phosphorous (P) losses Kg/ha/year



Indicative Nitrogen (N) losses Kg/ha/year



MANAGEMENT & LIFESTYLE

- When moving from a dryland livestock farm to an irrigated livestock finishing operation it is assumed the base skills are in place.
- Consideration would be needed of the management required to:
  - manage and oversee an on-farm irrigation development project
  - manage a more intensive and high-tech farming system
  - change the farming system to irrigated livestock finishing.
- Upskilling may be needed in grazing management to achieve stock performance at higher stocking rates.
- Whilst some casual labour may be required, this farm would remain a one labour unit operation.
- Management could be more decisive due to the certainty irrigation provides; it minimises seasonal risk and associated stress.
- Lifestyle changes would not be significant because this system is not a significant land use change. Irrigation however would increase workload.

CONCLUSION

It is difficult to make an investment in irrigation pay under this livestock finishing scenario. This is due to the additional pasture production during the period from late spring until early autumn, which is when lamb and beef prices fall from seasonal highs to seasonal lows.

Easterbo's heavy soil types are limited for winter use when sheep and beef prices are rising (the opposite effect than described above), meaning it is not the most profitable enterprise. If the soil was free-draining, irrigation could be used in summer to maximise crop yields in winter, taking advantage of higher seasonal prices. In Canterbury, irrigated gravel soils growing high-yielding winter crops such as fodder beet are more profitable.

In reality, a model of cropping through summer to take advantage of irrigation, followed by livestock trading from autumn through to spring would be a better land use for Easterbo.

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

Otahuao
- Sheep Dairy
- Mixed Operation

Easterbo
- Sheep Dairy
- Mixed Operation
- *Livestock Finishing*

For details of these options go to:
www.wairarapawater.org.nz

YOUR FEEDBACK IS NEEDED

This case study and the others in this series are designed to assist farmers to 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 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 livestock finishing 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

www.beefandlambnz.com

www.irrigationnz.co.nz

www.smartirrigation.co.nz

www.wairarapawater.org.nz