Water Wairarapa

EASTERBO SHEEP DAIRY

Case Study

INTRODUCTION

The Easterbo sheep dairy 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 sheep dairying operation. 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 Opus. 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 broadly considers only the first three factors.

ASSUMPTIONS

The table below illustrates the expected increase in milk production per ewe over the first five years of production. Due to limited information (on production, prices per kgMS and farm working expenses) available for sheep milking in New Zealand, these assumptions are unsubstantiated. They have been determined using a mix of sheep and beef costs and some dairy cattle milking costs.

Assumed milk production	Year 1	Year 2	Year 3	Year 4	Year 5
Kg milk solids per ewe pa	40	45	50	55	60

Key Assumptions:

- 97ha irrigated using 3,822m^3 of water/ha representing 56% of Easterbo's 175.4ha effective area.
- 97ha is used for growing pasture, plantain and lucerne (a third each). Pasture production under irrigation is assumed at 15,000 kgDM/ha.
- 2,000 milking ewes grazed on pasture or housed (in lambing sheds) during extreme weather. The assumed stocking rate is 12.3 ewes/ha.
- Lambing percentages are 150% in year 1, increasing to 170% in year 5.
- Replacement policy is 20% of the ewe flock, 500 are sent to grazing 1 December annually, with 400 retained to enter the flock.
- The property is planted with forage crops or pasture outside the irrigated area.
- Lambs not kept for replacement are finished on an area outside irrigation and all sold pre-Christmas.

FINANCIAL VIABILITY

Based on the regional average for properties similar to Easterbo, an expected Gross Margin from a dryland operation is ~$532/ha.

The following table provides an insight into financial viability at a Farm Surplus level before the cost of water (being Gross Farm Revenue less Farm Working Expenses, interest and depreciation).

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.

Farm surplus (pre-water)	Year 1		Year 2		Year 3		Year 4		Year 5	
	$ Total	$ / eff ha	$ Total	$ / eff ha	$ Total	$ / eff ha	$ Total	$ / eff ha	$ Total	$ / eff ha
Gross Farm Revenue	1,446,410	8,246	1,603,930	9,144	1,761,610	10,043	1,919,130	10,941	2,076,810	11,840
Farm Working Expenses (incl interest & dep)	(1,561,561)	(8,903)	(1,575,747)	(8,984)	(1,594,726)	(9,092)	(1,622,442)	(9,250)	(1,650,850)	(9,412)
Farm surplus (pre-water)	(115,151)	(657)	28,183	161	166,884	951	296,688	1,691	425,960	2,429

The increase in total farm surplus over the first five years is a result of increased production over the 5-year period but maintaining the milking flock at a constant 2,000 ewes.

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 assessment to irrigate requires a farm-by-farm analysis.

In converting land to sheep dairying, experience has proven that beginning with a 'greenfield' site results in a significantly more efficient development process that allows a tailor-made design to suit the property.

Capital expenditure & conversion costs	$
Shed	1,712,000
Water (reticulation & irrigation)	356,416
Stock purchases	1,030,000
Ground work & infrastructure	952,420
Total	4,050,836
Per hectare	39,800

The capital costs summarised in the table include:

- Double entry/exit 100-bale rotary sheds with automatic cup removers
- 1,000 head lambing sheds
- Centre pivot irrigation system
- Extensive fencing to 'right-size' paddocks.

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 4-5 years to achieve these results.

KEY SENSITIVITIES

Shown below is the gross revenue (per hectare) assuming a -/+ 20% movement in price per kg of milk solids, and an increase in milk production per ewe. The figures are based on 2,000 milking ewes and relate to milk income only (do not include meat and wool sales).

$/KgMS	$10.00	$12.50	$15.00	$17.50	$20.00
20 KgMS	400,000	500,000	600,000	700,000	800,000
30 KgMS	600,000	750,000	900,000	1,050,000	1,200,000
40 KgMS	800,000	1,000,000	1,200,000	1,400,000	1,600,000
50 KgMS	1,000,000	1,250,000	1,500,000	1,750,000	2,000,000
60 KgMS	1,200,000	1,500,000	1,800,000	2,100,000	2,400,000
70 KgMS	1,400,000	1,750,000	2,100,000	2,450,000	2,800,000
80 KgMS	1,600,000	2,000,000	2,400,000	2,800,000	3,200,000

Given the lack of information available regarding price, limited 'off the shelf' infrastructure and the relative infancy of the sheep dairy market, there is a high level of uncertainty surrounding the long-term milk price forecast and supply dynamics.

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 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 a higher level of 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 the sheep milking 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 and crops.
- Matching fertiliser inputs to crop needs (a crop nutrient budget).

Stocking policy

- The land resources on Easterbo are considered suitable for a sheep milking operation. Continuing to utilise appropriate soil conservation techniques would ensure ongoing sustainability.

Preventing soil damage

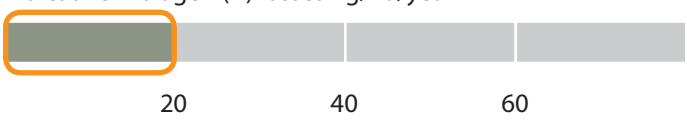
- The biggest potential limitation on Easterbo is pugging of wet soils with heavy cattle. This risk is eliminated through running sheep as a dairy animal. Care should be taken if cattle were to be run on the sheep milk platforms.
- Direct drilling the lucerne and plantain crops on their 5-year rotation would minimise potential for wind erosion which is a risk for Easterbo's loessal soils.

INDICATIVE NUTRIENT LOSSES

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

Indicative Phosphorous (P) losses Kg/ha/year

Indicative Nitrogen (N) losses Kg/ha/year



CONCLUSION

At face value, a successful conversion to sheep dairying has the potential to deliver significant returns above the Baseline Dryland system. However this performance is conditional on achieving the assumed lambing percentages and milk yields per ewe.

Conversion from current land use to a sheep dairy operation under irrigation carries risk. The lack of information and uncertainty surrounding the sheep dairy market in both New Zealand and offshore together with high capital costs of establishment (in excess of $4 million) suggests caution is needed.

While sheep dairying may not appeal to some farmers, those willing to take a higher risk and grow this emerging industry have the opportunity to be rewarded.

MANAGEMENT & LIFESTYLE

There are few precedents in NZ from which to model the move from a dryland livestock farm to a successful irrigated sheep farming operation. A paradigm shift will be required in management practices and associated lifestyle changes. This transition and the associated investment (in infrastructure and upskilling) will be rewarded with higher levels of sustainable farm surpluses.

Upskilling in milking, pasture management and animal husbandry will take time. While intellectual property in milking techniques and farming processes is tightly held in NZ, the industry is likely to collaborate more as it matures.

Management considerations

- Managing and overseeing an on-farm irrigation development project.

Labour considerations

- 3 full-time staff to undertake fencing, cultivation, weed control, shearing, shifting irrigators between milking.
- 4 casual staff required in the milking shed and lamb rearing.
- While labour availability is high, availability of experienced labour is low.

Pasture management considerations

- Providing animals with a mix of feed (including high-energy forages - pasture, lucerne and plantain) that optimises intakes and maximises milk production. Assumes a 5-year pasture renewal programme.
- The mix of forage species will provide options for cutting silage and minimise worm burden pre and post-lambing. There are currently no drenches available with a nil milk withholding period.
- Maintaining pasture covers between 1,300 – 2,500 kgDM/ha to ensure both pasture quality and quantity but not limiting intake by ewes.

Stock management considerations

- Requires rotations to ensure high intakes and includes supplementary high-energy feed in the milk shed to maximise yields. Also requires availability of quality drinking water.
- Attention to animal health status is paramount. Use of adult cattle, such as steers, can provide a form of parasite control for the milking herd.
- Feeding levels at key periods (pre and post lambing) reduce stress on the ewes and minimise effects of worms.
- With the assumed herd size of 600 ewes, Easterbo would have four herds enabling the spreading of mating and lambing to balance labour requirements, stock sales and milk production.

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

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 and we'll keep you updated on developments.

WHO CAN HELP

This information is intended to provide a starting point for considering individual situations. It covers just one scenario – conversion of the existing operation to sheep dairy 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.irrigationnz.co.nz

www.smartirrigation.co.nz

www.wairarapawater.org.nz