



# Case Study: water-wise farming

## Thomas family, Dairy Krowera

### Areas of concern

- low water supplies
- reduced pasture
- erosion and land slippage
- high energy, feed & fertiliser costs
- awareness of greenhouse gas emissions
- higher temperatures affecting milk production

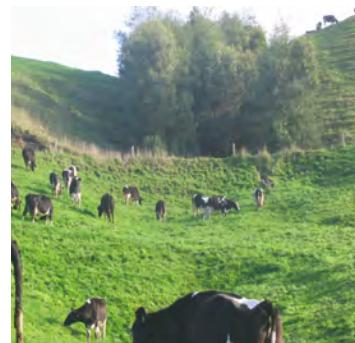
### Action taken

- recycle effluent water
- enlarge best performing dams
- build additional dams in best catchments
- troughs in most paddocks
- shelter belts
- extensive revegetation
- use effluent as fertiliser
- nutrient budgeting



### Benefits

- significant water savings
- improved pasture
- valuable shelter for stock
- erosion stabilised
- easier stock management
- improved pasture management
- extra water storage capacity
- potential to use plantings in carbon emission trading schemes
- stock on clean water are healthier and produce less methane



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**Installation of a Yard-blaster to recycle the water sitting in their effluent pond relieved Andy and Dianna's immediate supply problems.**

Like many other farmers, Andy and Dianna Thomas are experiencing the effects of climate change (low rainfall, shorter growing season, higher temperatures), and have decided to take action to prepare their business for what lies ahead.

They and a number of other local farmers have participated in the Western Port Greenhouse Action and Resource Efficiency Project to look at ways of reducing water use, greenhouse gas emissions and waste to landfill.

The first step was a stock take – not of their animals, but of their resources. “People never know what they’ve got, until they don’t have it anymore,” says the DPI’s Barrie Bradshaw. “By then it can be too late.”

### Water

By monitoring their water use, and looking carefully at their farm plan, the couple came to a few realisations. Water was not distributed evenly over the farm, which limited their ability to get the most from all their paddocks. While some dams were not holding water, the

<b>Who:</b>	Andy and Dianna Thomas
<b>Where:</b>	Krowera, in the hills between Loch and Wonthaggi
<b>Size:</b>	200ha (milking area: 110ha)
<b>Enterprise:</b>	Dairy (currently milking 190 cows but plans to increase over time to 200)
<b>Soil:</b>	Grey loam that holds water well on the south-facing slopes but is dry and crumbly on the west-facing slopes
<b>Aspect:</b>	Cleared before Andy & Dianna bought it, the property is very windy

dams in good catchments were still filling reasonably well. Apart from drinking water for stock, wash down was responsible for most of their water use. Finally, they had a large reserve of water sitting in their effluent ponds which was not being used.

Barrie Bradshaw suggested installing a Yard-blaster to recycle the water sitting in the second effluent pond for wash-down. Although the water is discoloured, the system meets EPA standards, and the milk continues to meet all industry standards.

Andy and Dianna are now focusing on long term improvements to their water system. They want to capture more water, and to be able to distribute it more evenly throughout the farm.

But instead of wasting time and money on underperforming dams, they plan to enlarge the best performing dams, and build additional dams in the good catchment areas. They will then move that water throughout the farm, via troughs, and a combination of pumping and gravity feed.

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### Effluent, nutrients & soil

Barrie encouraged Andy and Dianna to look at their effluent as a resource, and to incorporate it into their whole farm system.

Andy has bought a travelling irrigator so that he can spread the effluent in his ponds over a number of paddocks, and is considering buying a mixer to reduce the need to de-sludge.

Using the results of soil tests, Andy has drawn up a nutrient budget and a nutrient management plan – the idea being that he will only fertilise (either with effluent or a commercial application) if and when required.

By taking into account the nutrients contained in the effluent, Andy should be able to significantly reduce the amount of fertiliser he is buying in.

Andy can also maximise his pasture's nitrogen uptake and avoid waste by following the simple guidelines contained in DairySAT (the dairy industry's environmental risk self-assessment tool).

If Andy and Dianna can reduce the stocking density in the nutrient hotspots, they will also reduce the amount of their nitrous oxide emissions.



**The Thomas's whole farm was an important starting point for determining the location and distribution of their water supplies.**

### Pasture & vegetation

Andy and Dianna are keen to improve their pasture to boost profitability, retain valuable top soil, and reduce erosion. Cows fed on high quality pasture have also been proven to produce less methane than those on poorer pasture.

The factors affecting pasture quality include soil fertility, grazing management, and planting the most appropriate species for the conditions. With drier conditions and shorter growing periods, Andy and Dianna are being encouraged to investigate the deeper-rooted and more drought tolerant species that are becoming available.



**Vegetation has helped stabilise erosion in some areas, and acts as a filter to trap nutrients and sediment before they enter the catchment.**

Andy and Dianna's grazing management is tied in with their efforts to provide more shade and shelter on the property, particularly as milk production drops in hot weather. With the help of Landcare, Andy and Dianna have been carrying out extensive tree planting. They have already revegetated ten hectares, making good use of steep areas which are otherwise unusable. Their strategy involves fencing off and revegetating the creeks and gullies, and subdividing along those fence lines.

So far, they have increased the number of paddocks from twenty to forty, with most having access to troughed water. With more options available to them (many with shade and shelter) Andy and Dianna have greater control over grazing patterns. Promoting more even grazing, and avoiding overgrazing, are their priorities.

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### Energy

Geoff Andrews of Genesis Now carried out an audit of the dairy shed to understand how much energy was being used, and how.

Heating water and cooling milk account for most of Andy and Dianna's electricity consumption. Geoff identified that the cooling water was retaining too much heat from the previous milking. This meant that more energy was required to bring the milk temperature down to the desired level. He suggested re-connecting the cooling tower fan, and to consider night-sky cooling. This uses a material similar to a solar pool heater to radiate heat from the water to the cool night sky. He estimates that a \$5000 investment would result in an annual saving of more than \$1000.



**An energy audit of the dairy shed revealed a number of areas where savings could be made.**

Geoff also recommended replacing the mercury vapour lights with fluorescent fittings. Costing \$750, this would result in an annual saving of approximately \$137.

Taking into account the windy site, Geoff considered the feasibility of a wind turbine to power the dairy shed, and pump water throughout the farm. Installing a 10kW turbine would cost approximately \$35,000, and would save around \$4,600 per year. There is also the possibility of exporting power to the grid.

### The outcomes so far

The most significant gain the couple have seen so far involves water. "Without the Yard-blaster," says Andy, "we would definitely have run out of water." Andy also believes that using troughed water is better both for herd health ("the water is cleaner, so it must be better"), and for reducing erosion around dams.

Erosion is much easier to manage with smaller paddocks, and Andy is already seeing an improvement in pasture quality and density. "They won't touch the poorer quality stuff if it's in a big paddock, but they're more willing to graze it down when they're in a smaller paddock."

Andy and Dianna are continuing their tree planting, particularly in the gullies and riparian areas. The vegetation has stabilised erosion in some areas, and acts as filter to trap run-off before it enters the catchment. It may also be useful for offsetting the business's agricultural emissions or providing an economic benefit in future carbon trading schemes.

It is the shelter and shade benefits they get from the plantings that they most appreciate, however. "Whether you believe in climate change or not," says Andy, "there's more heat in the air, and the stock are definitely better for the shade." With milk production shown to fall on hot or windy days, shelter can have a big impact on profitability.

### Resources & links to other information

- **Western Port Greenhouse Alliance: (03) 9705 5129; [www.casey.vic.gov.au/wpga](http://www.casey.vic.gov.au/wpga)**
- **Gippsland Nutrient Extension Team: (03) 5624 2222**
- **Dairy Australia: (03) 9694 3730; [www.dairyaustralia.com.au](http://www.dairyaustralia.com.au)**