

CASE STUDY: HEW DALRYMPLE

Scale and efficiency

Janine Holland talks with Hew Dalrymple, who is demonstrating SMART practice on a grand scale.

Hew Dalrymple boasts possibly New Zealand's largest private irrigation operation. But the Rangitikei farmer knows size isn't everything. He's equally proud that his water is being put to efficient use and is going where it should for maximum growth. Variable Rate Irrigation, soil moisture monitoring and centre pivots provide Hew with the confidence that he's making the most of his water supply.

For five generations, the Dalrymples have farmed the coastal plains near Bulls. Grain, green feed, vegetable crops, finishing stock and grazing for contract make up the business. It's a profitable operation evidenced by the fact brothers Hew and Roger have expanded from the original family farm to amass another three farms within a 20km radius, one under 33 percent ownership with local iwi. The pair are now responsible for more than 3000 hectares of farmland in the district.

The scale of the operation becomes evident when you consider their irrigation systems. Twenty three centre pivots and one universal lateral irrigator service the four farms. Ambitious plans are underway to add another eleven centre pivots over the next three years. At a cost of about 350k each, that's a significant investment, but also reflects the value of water to the Dalrymple farming operation.

The first centre pivots were introduced in 2003 and within a few years Variable Rate Irrigation (VRI) was introduced. VRI allows modification of individual sprinklers on centre pivot and lateral sprinkler systems so water can be varied and optimised along the length of the irrigator.

"I wouldn't be without VRI now. It really makes a difference. We can consistently get at least 20 percent water savings through VRI. And by default at least 20 percent savings in electricity. For two irrigators the requirement was 100 litres per second. When VRI was used we managed to get that down to a range of 76–84 litres of water per second which shows a big saving."

The Rangitikei District climate is reasonably temperate with few extremes, but being on the coast means the farm experiences wind, especially from the west, in spring. Water is sourced from bores and to date, the Dalrymples have had no problem tapping into groundwater, with only three bores out of 13 deemed to be hydrologically linked to the Rangitikei River. "We put all of these bores down," says Hew. "Six were on the original farm. They are all between 20 and 100 metres deep."

"The farm name is Waitatapia with wai meaning water and tatapia meaning plenty. And there is plenty. For example, the most recent bore to be drilled had a sustainable flow of 175 litres per second at 50 metres," says Hew.



Cecilia and Hew Dalrymple

"We first started putting bores down to regulate our very variable yields on maize crops. We had substantial maize planted but the one thing it was most short of was water. So it became an easy decision, and as a result, we have diversified crop and vegetable production."

Running a reasonable-sized cropping operation (growing maize, wheat, barley, peas, squash, potatoes and trials with lettuces), plus a large stock operation, means their irrigation feeds animals and produces diverse crops on-time through the year.

"Irrigation maximises what we can produce from primarily two types of soil. Our farm is coastal so our irrigation focuses on both the silt areas with high gravels, very similar to Canterbury soils which have a high yield, as well as the large flat sand plains."

While the outlay for the centre pivots is considerable, the cost of operating them is just as important. "As well as the initial investment there is also the actual running costs, the electricity and diesel charges to consider." Hew says this provides a strong motivation to work towards best practice when irrigating.

Wayne Hosking, operations manager, oversees the irrigation on the four properties. His knowledge base has been built up over the years through seminars and plugging into the IrrigationNZ website. Talking to other irrigators also helps. "It's always good to gather information to improve our watering skills," says Hew.

So as well as Variable Rate Irrigation, monitoring of soil moisture levels is critical. Wayne uses a neutron probe system providing weekly readings. "It's not a daily recording but you still get very good, accurate data which gives you a good guide," says Hew.

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CASE STUDY: HEW DALRYMPLE (CONTINUED)



A trial lettuce crop

“Our regional council is very appreciative of our ability to show efficiencies of how we use our water. We show them the soil monitoring data and it’s all very transparent,” says Hew. “The map of the soil shows we are responsible users of water. A council is more likely to respond positively to applications if they know you are a reliable and sustainable user, and importantly have data to prove it.”

“We are always following new technology advancements in the market, for example, we are looking at a live moisture monitoring system to alter the irrigation plan more regularly, particularly for VRI.”

Electromagnetic mapping of their soils has helped pinpoint areas of production strength and weakness and provided the baseline for the Variable Rate Irrigation. “We’re still tweaking. It’s taken us a good two to three years to get the Variable Rate Irrigation maps correct because you need a number of maps for each crop. It may seem straight forward but at different times of the year, the sun is more intense – crop demands, weather events and evapotranspiration all add to the need for different maps.”

Once the new pivots come on line in the next three seasons, Hew visualises moving to a system where the machinery re-adjusts soil moisture requirements based on different crops and weather conditions. “Hopefully more information can be loaded in the future and then the system can make suggestions and you either accept or alter them. We will still want to make the overall decisions but I’d really like for the software to guide the infrastructure more.”

Hew’s advice for other irrigating farmers is to move to Variable Rate Irrigation.

“All New Zealand farms have highly variable soil types and to drive efficiency different water rates need to be applied and the only way to do this is VRI. The value of controlling each individual sprinkler to vary water application and intensity along pivots can’t be under-estimated,” he says.

“Yet I haven’t seen too many other Variable Rate Irrigation maps. My thinking is most farmers would see significant financial benefit from putting on Variable Rate Irrigation.”

But even with technology, Hew says you can’t replace visual assessments.

“A farmer will always work on intuition. You can get just as good an indication checking the paddock at the end of the day. You can’t just rely on technology. It’s really critical to keep an eye on the weather so you can adjust your irrigation schedules when you see something coming.”

The prospects for Waitatapia look bright, but Hew fears many New Zealanders do not yet recognise the opportunity that carefully-managed water provides.

Hew is also a strong supporter of efforts to develop more water storage infrastructure around the country.

“We just need to get on and build these water storage systems sensibly. It’s definitely the way to go, even for those who use underground supply.”

“We have a world to feed and it will be crops, not stock, which will feed it. That’s where we are going. New Zealand has an opportunity to further expand its crop farming, particularly in the perishable market which will grow in Asia in the next 50 years. And to do this we need reliable water, water, water.”

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