SMARTER IRRIGATION FOR PROFIT

Making the most of the RAW data at Bega

CASE STUDY

Nineteen millimetres.

It's a simple number – " basic" really – but knowing this figure has delivered a lot of benefits to one Bega Valley dairy farm.

It's because this measurement is the RAW – or readily available water – beneath the centre pivot irrigator at Will Russell's family farm at Jellat Jellat.

RAW is a measure of the water available for extraction by plants as determined by soil moisture probes, and it varies between soil types, crops, and season.

It's a guide to how often irrigation is required.

Will learnt this – and many more water and energy efficiency tips – through the Smarter Irrigation for Profit phase 2 program (SIP2), funded by the Department of Agriculture, Fisheries and Forestry, and Dairy Australia.

"Now we know the RAW for this part of the farm, we have a range of millimetres we put on under the pivot – between 12 and 19mm per pass – and we have learnt not to go above that," he said.

"We've also learnt that our other irrigation systems on similar soils are very wasteful."

Milking 300 cows, the Russell family farm was an "optimisation site" for the irrigation efficiency program.

The program's focus across three seasons was the pasture beneath the Russell's 25-hectare, five span centre pivot.

Tests on the centre pivot demonstrated increasing pasture production with decreasing elevation. It wasn't delivering uniformity with its water coverage.

"We weren't getting coverage over 10 per cent of the area on the highest point (of the paddock) due to low pressure," Will explained.

"The pressure wasn't high enough at the top of the hill but redoing the sprinklers (on the pivot), means it will operate with lower pressure and hopefully it will fix that problem and we can get consistent uniformity (of watering) over 100 per cent.

"It should lead to better growth in that 10 per cent that wasn't doing that well."

Will, who farms with his parents Rob and Pip, will refurbish their centre pivot sprinklers before peak irrigation season begins this year.

Other efficiency gains uncovered as part of the program included higher river water levels and the opportunity to change the screen on the irrigation pump suction intake to prevent blockages.

Australian Government
Department of Agriculture, Fisheries and Forestry

Dairy Australia

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While river levels weren't something that could easily be controlled, Will said changing the pump screen was one way the farm business was able to "do a better job, with the same energy" and therefore increase efficiencies.

Water and energy costs per tonne of dry matter decreased considerably between season two and three of the program, reflecting the significant rainfall in the latter season.

It cost $5.45/tDM to irrigate in the third season – where rainfall constituted more than 90 per cent of the water applied to the paddocks – compared to $25.10/tDM the season before.

To put this into context, Will said just energy and water for irrigation during dry years could cost up to $100/tDM, so the weather makes a huge difference to profitability.

The favourable conditions during season three provided the program, including its reference group of local farmers and service providers, with an opportunity to measure pasture yield without water limitations.

The result was a 20 per cent increase in measured yield, from 10.1 tonnes of dry matter per hectare in season two to 12.1tDM/ha in season three.

The wetter season delivered plenty of benefits for the Russell family, but Will said it made managing efficient and effective structured irrigation more difficult.

"Obviously rainfall is cheaper. There's less labour and energy put into irrigation, but we had four floods last financial year and it meant pulling pumps out (of the river) fairly regularly and then putting them back in to start irrigation again," he said.

Wet weather, or the threat of it, also posed challenges around irrigation decisions.

"Even right now, in the middle of winter, we should be irrigating according to the moisture probes," Will said.

"But we have East Coast lows that keep threatening the NSW coast. For example, rain was forecast – we were supposed to get drenched – so didn't bother putting the pumps back in. Two hundred millimetres was forecast, and we ended up with 3mm.

"It's very hard to know what to do. Just going off the moisture probes, we should be irrigating, but another forecast East Coast low could do anything."

Despite this volatility, having tools like moisture probes guiding decisions and a thorough understanding of concepts such as RAW has helped Will and his family improve their irrigation efficiencies.

For him, the biggest gains had come from improved and more accurate irrigation timing – especially at the start of the season.

"It has enabled us to grow more pasture consistently," he said.

MORE INFORMATION

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