

Australian farmers leading the way with a transformative irrigation system

We all know that water is one of our most precious resources – talk to any farmer and they will tell you that it is also one of their most expensive inputs. A new irrigation technology that uses gravity-powered micro-irrigation is hoping to reduce water use worldwide by transforming flood irrigation, which could save farmers’ water and energy costs.



Gary Spotswood

Queensland grower Gary Spotswood prides himself on being ahead of the game.

“Some of my neighbours look over the fence and think I’m doing crazy stuff. I just think it’s about being adaptable and open-minded, and willing to learn and try things,” he says.

Gary’s grandfather started the operation now known as Mt Alma Organics in 1927. It was a venture that began as 364 hectares of scrub and wetlands, which was cleared for conventional livestock farming before the introduction of sugarcane in 1967.

Gary and his wife Angela, aided by their son Daniel, have been running the farm near Inkerman in the Lower Burdekin region since 2011. It’s now a 430-hectare property.

In some ways, the operation has turned full circle.

“We’re back to farming how my grandfather used to farm without using synthetic chemicals,” Gary says.

But there are major differences too. The farm is now larger and more diverse, growing organic fruit and vegetables as well as organic sugarcane and beef. Managing the wetlands around the farm is also important to Gary.

“Being close to the Great Barrier Reef, we’re always getting fingers pointed at us,” he says.

“But farmers are modest. They’re reluctant to talk about the good things they do. You only hear about the bad things.”

Focus on sustainability

Mt Alma Organics is focused on becoming a leader in sustainability, which starts with produce grown in a sustainable, regenerative circular farming system.

“That’s why I was keen to give the new gravity-powered, micro-irrigation system N-Drip a go,” Gary says.

It is a technology that does not require an external energy source or a pressurebased water filtration system.

Gary has installed it on fields where flood irrigation was used to grow sugar cane.

“Our infrastructure wasn’t set up for drip irrigation in those fields, but I could see how we could set up an N-Drip system using the same infrastructure as the sugarcane. We’ve simply tapped into the same outlet,” he says.

Some fields are still using a previously installed conventional drip system to irrigate organic zucchinis while other fields use N-Drip, so a direct comparison is simple.

Because N-Drip works with very low pressure, Gary’s energy savings are significant.

“Energy consumption is about two thirds less with N-Drip, while yields are the same with both systems,” he says.

Setting up the infrastructure is another advantage.

“Conventional drip can’t be plumbed everywhere across the farm. With N-Drip, I can move to another field further away without having to run a high-pressure system to the new location. It helps me rotate crops,” Gary adds.

A disruptive technology

According to N-Drip Australia General Manager Udi David-Stern, the technology is a game-changer for the agriculture sector for big or small operators.

“There is huge potential for N-Drip to replace conventional irrigation practices for many broadacre crops like cotton, maize, sorghum and most vegetables including potatoes,” Udi says.

“In many cases the system has paid for itself in one season.”

N-Drip’s unique technology received the World Bank’s Excellence in Disruptive Technologies award because it can potentially replace less efficient flood irrigation – the most common irrigation practice around the world.

“Many people in Australia think N-Drip is a tiny start-up, but that’s not the case,” Udi says.

“We are operating in 20 countries with major corporations, NGOs and governments in the US, Asia and Africa.”

PepsiCo has recently partnered with N-Drip to test its technology in pilot projects on farms across India, Vietnam, and the U.S.

The results are very impressive, with crop yields improving using less fertiliser and 50 per cent less water than flood irrigation.

Following these successful pilots, PepsiCo and N-Drip will continue their partnership to help farmers grow crops more sustainably.

Success in the cotton industry

Cotton growers– who are among Australia’s biggest water users– are also reporting excellent results with N-Drip.

It’s been an extraordinary season for Queensland cotton farmer Howard Rother. His achievements have surpassed

all expectations. He has credited the system with delivering record yields and causing him to rethink the way he grows cotton.

To top it all off, the Nangwee farmer has been nominated for Cotton Grower of the Year, a recognition he never thought would be possible.

Howard expects the revolutionary system will eventually replace flood irrigation, saving the cotton industry millions in water costs and significantly boosting profitability.

It was used on 11 hectares of his 70-hectare crop. It yielded 11.5 bales per hectare compared with 7.5 bales produced in the flooded fields. The record yield was delivered using 26 per cent less water.

“You can see a massive difference between my fields with and without the new drip system,” Howard says.

“The trial has been particularly effective because we had a dry spell from November to January. It caused problems for the flooded fields, but the N-Drip system continued to operate well.”



N-Drip system used in a PepsiCo site in Nebraska, U.S.A.
Photographer: Martin Hobelman

The exceptional results meant the system paid for itself in one season, so Howard is keen to extend its use.

The cost of a single skip row configuration ranges from \$1,100 to \$1,300 a hectare, while solid is between \$1,400 to \$1,700 a hectare.

Bore water supplied the first two fields irrigated with N-Drip and a third block, which was to be added in September, uses dam water.

“A system like Howard Rother’s 11 hectares could easily be scaled up 10 times provided there is adequate water,” Udi says.

“There are no technical limitations preventing much larger scale projects and that is starting to happen. We are currently working on several blocks ranging from 70 to 140 hectares.

“N-Drip is outperforming any flooded block. The better the field is levelled, the greater the outperformance in terms of yield and water usage.”