

# Automated shut-off trial for flood irrigator brings good results



Pump infrastructure on Russell Jordan's farm. The silver pole is the radio control tower which sends and receives data, and the white box on the side of the main meter box is part of the software which switches on the pump and the automated valves. Photo by Wayne Smith.

Russell Jordan is fairly new to the cane industry. After spending 14 years under car bonnets as a mechanic, Russell was determined to try life on the land, and

in 2001 bought a 120 hectare farm near Guru.

To make up for his lack of experience on the land, Russell learnt by watching what good growers did and by making an effort to try out new farm practices every year.

Like many in the Burdekin region, Russell's farm is flood irrigated. Although many think of flood irrigating as wasteful, Russell says if done well it can be an efficient, low impact practice. To better ensure the efficiency of his flood irrigation system Russell is employing a range of technologies to ensure he uses just enough water to grow cane, and no more.

## Automated irrigation trial

One of these technologies is an automated irrigation shutoff system,

which he agreed to trial in 2009 as part of a project run and funded by CANEGROWERS.

Growers are always looking for ways of becoming better, more efficient, irrigators. CANEGROWERS believed there was a glaring research gap into automated systems which had the potential to not only save water, but also the time of growers who have in the past spent a lot of downtime waiting for the right time to stop irrigations manually so that the right amount was applied, without overwatering.

## How it works

"What happens is one valve will be open watering the cane, and we'll have a radio control sensor down the bottom of the block which senses when water gets down to the bottom end," Russell says. ▶

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"The radio control will then turn on another valve and then shut this valve off once the water reached the bottom of the block.

The trial covers over half the property, and depending on success of the trial, Russell would consider automating the whole farm.

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CANEGROWERS saw an opportunity to fund and run a project which had the potential to not only save water, but also the time of growers.

*Eric Danzi, Senior Manager - Planning*

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"The sensors are fitted up inside the paddock which allows the irrigation to be changed over before water can be seen at the bottom end. The water still makes it to the end but results in a lot less run-off."

The valves are a 300 mm wheel valve with a 24 volt electric motor which is operated via software installed on a computer in the home office.

When Russell orders water 24 hours in advance, he hops on his computer, types in the time and date the irrigation should start from, and presses the 'ok' button to set the timer.

"We installed the system in early November and have had six irrigations since then. Apart from a few niggles fine tuning the settings of the sensors and altering cup sizes and flow rates, the system is now operating seamlessly. If the early results are anything to go by, at this stage we would - at the very least - look to fit sensors to our paddocks at the bottom end of our property."

### Building a contained system

Russell is aiming for a contained system on his farm, which captures all water and nutrients using tailwater dams.



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### REEF RESCUE

Reef Rescue is aimed at addressing off-farm impacts on water quality by encouraging voluntary uptake of the latest technology and best practices.



These dams catch the excess water that applied to the crop, which is then reused to water the crops via the farm's irrigation system. This prevents excess water running out and into the water table.

"I am also monitoring my tailwater for nutrients and herbicides through the Pixal project run by BIFMAC. Then if I see any high readings I can change my practices to try to prevent any losses," he says.

### Water use and water table monitoring systems

Russell is a member of the SRDC funded Upper Houghton Water Balance Groundwater Project.

"The table's rising and we just keep monitoring it. We've got a bit of a model made now too to just see what we can do about it - where it is coming from and what we can do to rectify the situation," he said. ▶



CANEGROWERS Burdekin Member Services Manager Wayne Smith (left) with Russell Jordan.

There are 20 piezometers around the district – which are basically wells, small in diameter, that measure the hydraulic head of groundwater in aquifers.

In addition to monitoring what's going on in the district through the piezometers, Russell also has lysimeters buried in his soil around the farm.

"They're actually like cups that are buried 1.5 m into the soil profile. They are sealed off with a vacuum tube, and they measure any water that gets past the root zone which is heading down into deep drainage," he says.

"After I irrigate, we usually check how much water has actually got down past the root zone."

Russell has also had a SIRMOD model (run through BSES) to show how fast the irrigation seeps into the soil.

"That in conjunction with the lysimeters, has shown us easily how much deep drainage we're getting and how good our irrigation is," he says.



I am also monitoring my tailwater for nutrients and herbicides through the Pixal project run by BIFMAC. Then if I see any high readings I can change my practices to try to prevent any losses.

*Russell Jordan, Burdekin cane grower*

### Targeting input applications

It is not just irrigation that Russell is carefully monitoring to ensure efficiency. Russell's farm secured Reef Rescue funding in the first round to implement a system to target his input applications. Because the soils on farms vary from one end of the farm to another - even from one end of the paddock to another - a system that delivers the right amount of the right blends to the different areas on a property can save time, money and reduce the impact on the environment.

"As part of Reef Rescue, I received funding for a GPS for my tractor and

also a variable rate applicator for my fertiliser box," says Russell.

"Previously we would have to mark out a section, run through, work out how much fertiliser it needed and then change cogs, adjust chains and all those sort of things to get close to the right rate.

"Now I do much the same thing, but everything is stationary. You sit down, dial it up through the GPS screen, capture what fertiliser, record it, set it all in. You can also change rates through the paddock if needed. Or if you change blocks or change farms, it's just so much simpler. No changing chains or cogs or anything like that." ■

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