



Flood slows to a trickle

Paul Villis

It's a radically different way to water cane and has neighbours looking over the fence. It uses far less water, increases yield and really improves the quality of water that runs off farms.

Paul Villis grows cane near Ayr and he's trialing trickle, or drip, irrigation on part of his farm. Trickle irrigation comprises rows of plastic tape buried underground that delivers water directly to the roots of the plant through tiny drippers that regulate water flow.

Ayr is in the heart of the Burdekin region and all sugar grown here is irrigated. Most farms are irrigated by flooding the inter-rows which is labour intensive but, from an infrastructure point of view it's cheap.



Not all irrigation systems in the Burdekin are metered, making water quite inexpensive for some growers. Paul's channel water is metered. Burdekin farmers are under increasing pressure to improve the quality of water running off farms and into lagoons, creeks and into the water table. There are some sugar growing areas that aren't viable anymore because of salinity.

The trickle block is using a lot less water than the flood blocks but they don't know how much less at this stage.

Paul's comfortable with the idea of trickle irrigation because he used to grow corn and beans in Bowen. Most of his cane blocks are flood irrigated but he installed trickle on a small area because the shape and form of the blocks weren't suited to flooding - he was getting unreliable watering. He has seven hectares under trickle with potentially more to come.

Trickle irrigation is a lot more expensive than flood infrastructure. Paul weighed up spending the money laser leveling the problem blocks or installing trickle, both costs were comparable.

Trickle tape costs \$3,500 a hectare alone. Other infrastructure, like pumps, filters and computerised timers, is on top of that. Paul says, "It's a 10 year project really. You've got to look at the life of it. The life of the tape is 10 years plus."

Funding through the Australian Government's Reef Rescue program made the conversion much more affordable. NQ Dry Tropics administers the program's funding throughout the Burdekin Dry Tropics region. Reef Rescue is about helping landholders make the changes that will improve the quality of water running into the Great Barrier Reef.

From the initial small trial block, yields increased from 160 tonnes a hectare under flood irrigation to 195 tonnes a hectare under trickle. Paul thinks that if the results of the small trial are consistent, the

cost of trickle tape will be paid for in less than three years. Paul says it's difficult to translate these gains to larger blocks because the trial was so small. He thinks they'll have a better idea about the benefits after the completion of the 2010 harvest.

He's stuck to the same fertiliser rates as he would use under flood and he says there are potential savings in fertiliser requirements. Trickle isn't as demanding on labour as flood is. One of the other big differences between the two is the irrigation frequency. Paul used to water the blocks once a week under flood, under trickle he's watering every day. The system is controlled by a computerised switchboard which schedules timing, something a local extension business helps determine.

Steve Attard from CSIRO thinks trickle has the potential to be applied to a number of fields in the Burdekin. He's helping Paul with irrigation scheduling.

He says, "There's scope for more drip irrigation in the Burdekin especially in small paddocks that are hard to furrow [or flood] irrigate and have soils that have high infiltration rates, like sandy soils."

Trickle irrigation enables you to increase the precision of irrigation scheduling and nutrient application. Steve says it's the combination of these things that allows farmers to maximize their production and reduce inputs.

Trickle irrigation also allows you to apply nutrients each time you irrigate in small amounts and more frequently than flood. By applying smaller amounts more often there's less chance of losing nutrients through rainfall events and you're not saturating soils and causing denitrification – something that happens when nitrogen fertiliser converts into nitrogen gas and is lost from the soil profile.

The downsides to trickle are the risks of the tape and drippers clogging, cane roots getting into drippers and rats damaging the tape. So far, one season on from installation, none of these things have happened.

The farm is in a poor water quality area in terms of promoting algal build up so Paul flushes the trickle tape out with hydrogen peroxide every two months or so. Paul is doubtful whether anyone who isn't using channel water or who has high iron concentrations can use trickle because of its tendency to clog up. Water with high iron content is common around the Burdekin.

Trickle irrigation is green trash friendly. Paul says they've tried cutting the cane green instead of burning it a number of times but it doesn't work because, under flood irrigation, they can't get the water to run down the rows. With trickle that's not a problem since the tape is underground and it feeds water directly to root zone.

Steve Attard thinks there are opportunities to examine trickle systems across other farms but the economics is the big factor. He says, "Paul has shown there are substantial production benefits but we need to look at how the benefits accrue over the lifecycle of a crop system. We need proof of performance over five to 10 years."

A point to consider with trickle is electricity bills. Evan Shannon has worked with BSES and a number of farms in the Burdekin that have installed trickle irrigation. He says one of the biggest issues with this type of irrigation is that it uses a lot of energy due to its pressure demands. Electricity is an ongoing and ever increasing cost. He says, "It will cost you considerably more per megalitre in electricity compared to furrow but you should use significantly less water in total."

Rats can also hinder watering but Evan says rats can be managed with good hygiene and baiting.

This is the course another farmer in the Burdekin takes. He's used trickle for 15 years in cane and says he's had no problems with it but he uses a lot of bait to keep rats at bay. The cane and vegetable grower prefers to remain nameless.

He says he gets 15 per cent improvement in yields from blocks that are trickle irrigated and he's in the process of converting more blocks from flood to trickle. However he doubts he would put in the investment of trickle if the blocks were solely used for cane and not horticulture as well.

Evan Shannon points out that emitter blockage can be caused by root intrusion or precipitates of soil and/or fertilisers. They can be recognised by strict monitoring of flow rates and paddock pressures and strategic maintenance programs.

Paul Villis says they're not rushing in to convert other blocks to trickle unless there are good incentives to do so like water restrictions or price increases in future. He says they'll be the driving influences as to whether trickle is affordable.

"Trickle has the potential to deliver the best water quality outcome in the area. Everyone's sitting on the fence waiting to see if it works or not." He says.

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Our region includes the local government areas of Townsville, Charters Towers, Burdekin, Isaac, Barcaldine, Etheridge, Hinchinbrook, Palm Island and the Whitsundays. Website: www.nqdrytropicals.com.au



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