



## Low pressure pivots and soil probes boost production

By Neroli Roocke

As you drive into Mareebee, on the Great Dividing Range inland from Cairns, you're greeted by a sign boasting that the town gets 300 days of sunshine a year. That's perfect for visitors and also great for growing sugarcane provided it's adequately and efficiently irrigated.

The biggest growers in the district are CANEGROWERS Tablelands Chairman **Tom Maisel** and his brother **Brad** with



Tom (left) and Brad Maisel

around 1,000 ha under cane on five farms, many of which were converted to cane from rice-growing in the 1990s.

On the day *Australian Canegrower* visited, they were assembling their 12th centre pivot, the latest purchase in a program of converting their production from furrow, or flood, irrigation to overhead.

"We're aware of possible salinity issues, rising water tables, so we're replacing some of our furrow irrigation with overhead low pressure centre pivots to contribute less to the rising groundwater issues," Tom explains.

He says rising electricity costs mean pumping costs are 'getting out of control'.

"We're not using a hard hose or high pressure. These centre pivots require a minimal amount of pumping."

Tom estimates low pressure is about half the energy cost of high pressure. The pivots are electric drive but he says they draw only about 7-8 amps to move around a paddock.

"The pumping is the biggest cost but because they only need about 25-30 psi at the regulators, that's probably about as efficient as we can get at the moment.

"The only lower electricity user would be trickle tape but with the type of water we have, and vermin like rats that chew the tape, it's not an option for us.

"Plus plenty of things always go wrong with irrigation and it's better being above ground where you can work on it – we can get to it with spanners rather than have to dig it up with a shovel and find the faults!"

This latest pivot, Brad says, has the capacity to water 6mm a day in a full circle over around 220 acres. That, they estimate, is enough to keep up with the highest evaporation rates they experience in the Arriga area, west of Mareebee.

It had arrived on pallets and, like the backbones of long-dead dinosaurs, each arm is taking shape on the ground before being lifted and bolted onto 'legs' and wheeled into position to eventually be linked with other sections.

Eventually this twelfth unit will have nine spans, just a small one for this operation according to Brad and Tom, as some of their other irrigators stretch to 12 spans.

A key reason behind the Maisels more efficient watering rates, and therefore better yields, are the EnviroSCAN probes embedded into paddocks which ►

The pivot sections take shape. Photos by Neroli Roocke



provide data on soil water content. The probes are in 20 locations around the district and are constantly monitored by CANEGROWERS Tableland Extension Agronomist **Drew Burgess**.

Different sensors measure at different levels, down to 1m deep, and the information goes into a graph which indicates if soil moisture is trending up or down.

"If we start trending down, Drew will call me," Brad says.

Tom says he's been surprised to learn that cane plants can take water from depths as low as 1m. "When you dig it with a backhoe you don't see those roots, they must be very fine," he says.

"Through the winter while we're harvesting we'll lower the soil moisture level but once the harvester has come through we slowly start to build it up through the cooler months so that when the November/December hot westerly winds come, and we're not getting rain, we can have a profile of 75-80%.

"We never want to be at 100% because when we get rain, all that water runs off and we've lost that rain so we like to put that into the bank and save it."

Tom believes the soil probes are a far more accurate measure of soil moisture than the old method of plastic evaporation mini-pans or digging into the soil with a shovel to visually assess how wet it was.

"I call that fool's moisture, because it would look moist and stick together in your hand and cake like clay, but the crop wasn't growing. It's these EnviroSCANS which have really helped us with crop yield."

Brad says they also provide information so irrigation can be tailored to the different requirements of the crop at different points in the growing cycle.

"You can get caught out," he says. "You'll be watering at one rate and it will be fine but then the crop will hit that stage where it really takes off and really starts using the water. If you're not there and prepared with the probe to tell you it's using a lot more water than it has been you'll miss out on its best growth."

Brad and Tom say their cane usually reaches that point around September or October, depending on when it's been cut, and it gets a kick of warm weather and starts growing faster.

They've also observed that different varieties require different amounts of water at different stages of growth and some respond better than others to irrigation. For example, Tom says they have learned that the newer varieties have proven to need much more water than older ones, such as Q124 which grew under many different conditions but succumbed to orange rust.

"At first we were growing the 200s, like Q208, with the same practices

but they're a different breed. They need intensive water so they're more expensive to grow but they'll give you the returns if you put the inputs in. They're a bit more high maintenance."

Over the past few seasons of improved irrigation management, farm productivity for the Maisel family has increased. Their yield has gone from 121 tcph in 2012 to 142 tcph in 2013. The Tableland Mill area average yield in 2013 was 108 tcph. ■

## SHORT & SWEET OF IT

- Tom and Brad Maisel have been converting flood/furrow irrigation areas to efficient low pressure overhead systems.
- Water use efficiency has been enhanced by responding quickly to information from soil moisture probes.
- Yield increases mean their farms are producing almost 40 tcph more than the Tablelands Mill area average.



Another Great example of efficient use of water on farm