BALANCING ACT

Finding the happy medium between irrigation and drainage a challenge for this Bloomsbury grower

By Neroli Roocke

Water is a balancing act for Bloomsbury grower **Layton Mitchell**. On one hand he's building drainage lines to take spring water away from his crop and on the other he's diligently monitoring his cane's growth to make sure it has the right amount of irrigation at key points in its growth phase.

Along with his cane, this farmer who moved to north Queensland from Africa, is a cattle whisperer. He has a small herd that comes at his call on the higher, grassy slopes of his 300 ha farm.

On holiday with his family in 2003 in the Whitsundays, Layton says they had a spare afternoon, went for a drive and ended up liking what they saw.

Given a government program of redistributing farms away from white landholders in Zimbabwe, they made the decision to invest in Australia and relocate.

"I used to employ 300 people but when I left I decided I didn't want to employ anybody but myself," Layton says.

"I looked for something that was mechanised that I could do on my own and so that's what I'm doing.

"I contract the harvesting and planting but everything else I do myself."

Armed with qualifications from agricultural college and experience in growing crops including wheat and stem roses he took over the property and its 170 ha of cane paddocks.

Depending on the fallow, about 150 ha is under cane in any given year. Layton describes it as a wet farm with heavy clay soil.

"We've got quite a high percentage of very heavy clays and waterlogging issues during very wet years and they stay wet for a very long time," he says.

"We've been doing a lot of underground drainage so we can divert the water that comes to the surface and then plant those lower, wetter areas."

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Pictured: Layton Mitchell has layered river sand and perforated pipes in trenches to divert excess surface water from low lying areas. He has a small herd of cattle on the farm's hgher, grassy slopes.

Pictured: Layton Mitchell and his family moved to Queensland from Zimbabwe where they'd had a farming business employing 300 people.

"Probably 80% of the root ball is in the top 20 cm so we want to stop that from getting water-logged."

Using a laser level, a line is marked and an excavator with a 300 mm bucket digs a trench to a depth of one metre.

A layer of 100 mm of river sand is put at the bottom of the trench, over which a perforated PVC pipe is laid and then covered with another 100mm of sand before soil is back filled.

"It's been working well – we've had some of it in for four years now and the only problem we've had is some blockage with roots from the cane or trees on the edge," Layton says.

"We've checked the water coming out with Sugar Services Proserpine and it's suitable for irrigation, not too saline, so there's no issues with the water quality."

The pipes take the water to open drains and Layton has future plans to harness and store it.

"We have four dams, a couple of which we've put in since we've been here to improve our water storage, and they harvest a lot of surface flow particularly from the higher country on the eastern side of the farm," Layton says.

Irrigation is carried out post-harvest through to Christmas using up most of the stored water ahead of the natural summer rainfall of the Whitsunday area although in drier years, irrigation is also needed in March and April.

Layton's low pressure pivot irrigator originally covered 60 ha but after being flipped and damaged by Cyclone Ului in March 2010 it was rebuilt and now irrigates 40 ha.

"We had four hours of 200 km/hr winds and never expected it would go over but it did. A friend and myself took it down, every nut and bolt, and rebuilt it," Layton says with a shake of his head.

"It took us about three weeks. I shortened it by one span because that's what we could salvage from the twisted wreck that we had.

"There wasn't a leaf left on the crop and it was flat on the ground but we managed to harvest most of it that year even though the season ended up being very wet."

Given the cost of electricity, Layton is keen to maximise the benefit every time he turns on either the pivot or his hard and soft hose irrigators.

He estimates the pivot costs $54 per hectare for a 40 mm irrigation cycle just in electricity.

The travelling irrigators' cover the cane the pivot doesn't reach but their electrical cost is $73.60 per hectare which is 36% higher than the than the pivot.

Continues next page...

Pictured: Above, rebuilt after Cyclone Ului in 2010, the pivot covers 40 ha of the farm and right, the implement used to sweep trash into the inter row after harvest to encourage cane emergence.

"We use the most efficient tariffs – tariff 65 at night with the four travelling irrigators and tariff 66 on the pivot," he says.

"The travelling irrigators take most of an afternoon to set up and once the pumps and the pressures are sorted out it's 8pm – it's a big day and then together they'll only cover 10 hectares a night.

"The pivot is much easier – I run it on a schedule calculated based on the evaporation for the month measured by tensiometers which determine how dry the soil is getting by the vacuum that the roots create in the soil as they extract the moisture."

Layton does daily readings of the moisture probes and when they indicate 50% depletion of soil moisture capacity he irrigates to replenish it. Given the heavy soil, with 40 mm going on in each irrigation event, he has no runoff.

Working with **Peter Sutherland** and Frank Miller of SSP, he has been trying to measure the growth of his cane from the early stages through to maturity.

They want to identify which times are the most important for water to be readily available and for the soil profile to be saturated.

"We did it with wheat in Zimbabwe. At certain stages like tillering and flowering it was critical that you had the water because that ensured a better yield," he says. "It isn't as easy to see with cane but we are beginning to get the information to establish those periods.

"What we've learned from the tensiometers is that the growth is dependent on temperature so once night temperatures are above 22 degrees and days are around the 30 degree mark, the plant kicks in."

On Layton's farm that's generally around the middle of November.

"That is a period when my crop height will be around the 60-65 cm stage so at that moment, the crop is ready to bolt ahead and elongate.

"The other critical time is between the 60-75 cm when the plant is tillering and you must have the water available to retain those tillers which then multiply into yield.

"From there on we hopefully get sufficient rain to satisfy its requirement of 8-10 mm per day once it's over the 150 cm mark."

Fertiliser is applied post-harvest using a double disc opener stool splitter along with grub control in one operation prior to irrigation beginning.

Layton has modified an implement that he uses to sweep the top of the stool to clear the trash blanket into the inter row after harvest to allow the sun to penetrate during the colder months to speed up cane emergence.

He maintains a high row profile of around 20 cm which assists to keep the cane roots out of the water.

"Probably 80% of the root ball is in the top 20cm so we want to stop that from getting water-logged," he explains.

The tactic is working with one block of Q208 growing into its sixth ratoon and still yielding around 100 tonnes/hectare.

In 2015, Layton harvested 12,516 tonnes off 140 ha with average CCS of 15.65.

That was a season characterised by a drought declaration for a district just down the road and Layton's farm recorded only 680 mm of rain when his 10-year average is 1,629 mm.

As a result, his dams only half filled and Layton decided to give the crop just two 40 mm irrigation cycles, retaining the remaining water for 2016 crop establishment.

Though the 2016 water allocation was lower than 2015, the cooler winter and spring temperatures have meant lower evaporation.

"The crop managed to limp through until after Christmas when we received a substantial rain event in excess of 265 mm over a six-day period," Layton says.

"The 2016 crop has great promise together with a better sugar price." ■