

The Ingham field trial at Errol Cantamessa's property.

Project details

Key Focus Area

Farming systems and production management

Project name

Too wet to forget – reducing the impact of excessive rainfall on productivity

Project number

2014/028

Chief investigator

Dr Barry Salter

Putting varieties to the test with waterlogging

New research is hoping to better understand the impact of waterlogging upon different sugarcane varieties, with the aim of providing better information for growers and millers.

Dealing with big rainfall and the challenges of waterlogging are a familiar problem for Australian sugarcane growers and millers.

Since 2010 there has been multiple very wet years that have wreaked havoc on sugarcane production in all growing regions.

The numbers tell the story. From 2009 to 2013 the Australian crop was 30 million tonnes or less, dropping as low as 27.5 million tonne in 2010. It is only in recent years that yields have recovered from that severe impact, which compares starkly to the 36.5 million tonnes of 2016.

Understanding this challenge, SRA research is looking at the issue of waterlogging for the Australian sugarcane industry, with the aim of learning more about how different varieties respond to waterlogging.

The work won't be able to completely stop the impact that will come with extended rainfall, flooding, and cyclones, but it is hoping to provide valuable information to growers and the SRA breeding program in order to better understand how different varieties perform in wet environments.

As part of that research, a field trial was established in Ingham at Errol Cantamessa's farm in 2015 to assess a range of varieties with different waterlogging treatments.

"To establish this trial we needed a site with both clay soil and irrigation, where we could set up basically rice paddies to grow cane in waterlogging conditions," explained SRA Principal Technician, Glen Park, who is working on the project led by Dr Barry Salter.

"In this experiment we had eight different commercial varieties with three waterlogging treatments: a control treatment with no waterlogging; an early waterlogging treatment in December; and a later waterlogging treatment in January," Glen said.

"The same varieties were also included in a waterlogging experiment conducted in pots at SRA's Mackay research station. Our aim was to assess whether we would get the same variety response in pots that we observed in the field.

“That way we would not have to repeat the field experiment, which is difficult to establish and manage. It could potentially allow SRA to assess the waterlogging tolerance of new varieties via pot experiments.”

The Ingham trial showed that there were significant differences in how the varieties responded to waterlogging. It assessed Q183^φ, Q200^φ, Q208^φ, Q219^φ, KQ228^φ, Q232^φ, MQ239^φ, and Q247^φ.

Lowest yields and net revenue resulted from the December waterlogging treatment, while the January waterlogging event did not significantly reduce the yields of Q219^φ, Q232^φ, MQ239^φ, and Q247^φ. This suggests these varieties may be more waterlogging tolerant, however further work is still required.

Q232^φ had the highest net revenue under the January treatment and Q200^φ had the highest revenue for the control, at this site.

Mr Park said the trial showed that there were significant interactions between varieties and waterlogging.

“This is all about being able to develop a low-cost technique for assessing waterlogging, and we want to be able to rank varieties as they are released.”

“So far results from the pot experiments have not been consistent with what was found in the field, suggesting that the methods may need to be refined prior to this process being used on a regular basis prior to variety release.”

Further pot experiments are currently underway and the field trial has been continued with waterlogging treatments implemented in the first ratoon crop.

This information will also be presented at a poster at the Australian Society of Sugarcane Technologists (ASSCT) conference in May in Cairns.

More information

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Below (inset): Measuring the outcomes of the trial in the field during the 2016 harvest season.

Below: The accompanying pot trial taking place at SRA's Mackay research station.

