



Regular testing keeps Pachymetra from rearing its ugly head

Ongoing vigilance is the key to keeping on top of Pachymetra for Tully grower George Henry.

George Henry is a firm believer in regular Pachymetra testing at his farm.

Each year he has tests completed through collaboration with Tully Sugar Limited and SRA, and even though the results show his counts remain less than 10,000, he still sees that it is an issue to be vigilant about.

"My counts are low and I aim to keep it that way, particularly as many of the varieties I grow are rated as intermediate to Pachymetra," George said.

His farm is relatively new country that has been growing cane for about 20 years, which he attributes as one of the factors behind the low count. He also feels that his soil biology is working well through controlled traffic farming, which he says is helping reduce his Pachymetra risk.

While his variety decisions are based primarily around productivity, he said testing was important for making informed decisions.

"My main variety is Q208(b) and it is about 50 percent of my farm, and I do not want that at all. We have a variety management

plan in place for the farm and the target is a 30 percent maximum for any one variety, even though I've had to go over that for the moment," he explained. "We are working to reduce that percentage."

He is also growing SRA3(b), Q240(b), Q253(b), and SRA1(b), and also tested Q241(b), but since removed this variety from his farm. He is also trialling SRA1(b) and SRA7(b).

Pachymetra has been identified as an important focus for productivity improvement in the Tully district and is an issue that is continually being worked on in collaboration between TSL and SRA. TSL have conducted two surveys in the past five years, one in 2013 and one just completed in January 2018 which is currently being analysed by SRA.

The two most popular varieties in the Tully district – Q208(b) and Q200(b) – are both intermediate-rated varieties and represented 62 percent of the crop in 2017.

The previous survey, in 2013, showed an increase in all sub-districts since the previous survey in 2004, and Cane Productivity and Development Manager,

(Above) Tully grower George Henry is vigilant about minimising the Pachymetra risk at his farm.

Greg Shannon, said growers are all urged to get a soil test prior to planting, especially if they are planting varieties that are not rated as resistant.

Greg said that because Q208(b) is rated as intermediate for Pachymetra, this is one of the reasons that it is so important that the district work together in ensuring a strong future for the variety.

To do that, the district is reducing the reliance on Q208(b) and bringing other varieties into the mix, just as George is working to do at his own farm.

"One of our goals is to keep a strong future for Q208(b), and the only way to do that is drop our reliance on it to a lower percentage. We have already dropped it from 48 percent to 43 percent and the goal is to get it to 30-35 percent just to recede any chance of it being taken down by a disease like what has happened in the past," Greg said.

Greg gave two examples as Q250(b) and Q253(b) as new varieties that are increasing rapidly, partly because they are being fast-tracked based on local data from both the Tully Variety Management Group and commercial mill results. ■



DNA technology gets to the root of the matter

For more information, contact:
 Dr Johann Pierre
 E johann.pierre@csiro.au
 T (07) 3214 2267

Roots make up a large part of the sugarcane plant, but they are difficult to research and not very well understood. However, an early-career research project has looked at the application of DNA technology to make understanding roots simpler for the Australian sugarcane industry.

It was during a chance encounter at an SRA workshop in 2016 when Dr Johann Pierre had the idea of using DNA-based technology to better understand sugarcane roots and productivity.

Dr Pierre was already working with CSIRO on an SRA-funded project that was improving the understanding of the roots of sugarcane. Through this project, he had experienced first-hand the challenges of assessing sugarcane roots. Washing, measuring, and analysing the roots of about 70 cane plants from a glasshouse consumed almost four months of work.

In that process, the washing of sugarcane roots also destroyed some of the finest roots, which are vital for water and nutrient uptake for the plant and represent about 90 percent of the root length. This manual process also does not give an indication of whether roots are alive or dead.

"At the workshop, I met SRA Researcher Rob Magarey, who explained the technology used by the South Australian Research and Development Institute (SARDI), which was already being used to understand roots and pathogens in other crops," said Dr Pierre, who is a Post-Doctoral Fellow with CSIRO. "I took it from there to apply for an early-career researcher award through SRA to

investigate this technology's application for the Australian sugar industry."

Through the ECR project, Dr Pierre has presented a fast and efficient method for understanding live sugarcane root mass in soil samples.

An assay on root health could present several opportunities for the industry. One of these is that roots – the mass of them, and if they are alive or dead – can act as a barometer for soil health.

Having that information on the roots underground could provide growers with the evidence needed to change practices above-ground.

There is some further work to occur before the test could be brought to the industry (see article page 24-25).

With the root assay, further work needs to occur on developing field sampling strategies and methodologies to reduce the variability of assay results and determine the optimum sampling protocol. Currently, soil cores are collected, which is a laborious process that needs improvement, Dr Pierre said.

It may also be able to link with current work underway using the DNA-based technology to assess for pathogens.

Dr Pierre said it was an opportunity for a technical jump forward. "The diagnostic tool developed by this project could contribute to robust and practical decision-making for the sugar industry in the high priority area of soil and root health," he said.

It could also be used in the Australian sugarcane breeding program. While not used currently in sugarcane, root traits have been considered in other crops in breeding for drought tolerance, for example.

It is also hoped that this work will link with SRA's current investments into soil health, including a large project underway led by researcher Davey Olsen.

The work also came with significant support from SARDI (both time and financial) and in particular from Dr Alan McKay and Dr Danièle Giblot-Ducray.

"I am grateful for their generous guidance and support and for adding so much value to this work," Dr Pierre said. ■

(Above) Research is investigating ways to use DNA technology to investigate sugarcane root health.