



# Holistic approach to soil health to stay ahead of the cost wave

**The Werner family at Septimus have been involved with a range of research activities, along with implementing advanced farming practices, to continually lift production.**

**BY BRAD PFEFFER**

**Mackay district farmers Dennis, Annette and John Werner have done the sums on increasing input costs.**

Based on the current rate of increasing costs, especially for big ticket items like electricity, the Werners estimate that they need to produce 125 tonnes of cane per hectare (TCH) across their whole farm by 2025 to remain viable.

This need to lift the bar is not new to the Werners, as they have been long-term innovators and early adopters. In recent years, this work has paid off as they have seen their production lift from around 75 TCH to about 95 TCH.

They said that there is no one silver bullet to lifting productivity, but it comes through a range of improvements and measures all working together.

A big part of that is improving their soil health.

“For many years, we only looked at what happened above the ground, but now we realise there is much more happening

under the ground. That’s where we’ve got to farm: underground, and then work upwards,” John Werner said.

This involves a range of practices that include: 1.8 metre (single) row spacing, rotational crops at the end of the crop cycle, a comprehensive soil testing regime treating all varieties and blocks differently, using liquid fertiliser, improving soil pH with lime, and improving their efficiency with pesticides and herbicides.

In addition, they say that the application of mill mud has been an important part of their farming regime.

They have constructed a slab that meets Queensland Government regulations for the mud. Being 32km from the mill, this means that they can take deliveries of mud during wet conditions when trucks can’t get onto the paddocks close to the mill.

They have also designed and built their own sub-surface applicator that uses two discs to place the mud in furrows 70mm

wide and 150mm deep, either side of the cane row and about 30cm from the centre. This machine – and also their shielded sprayer – was built with the help of the Reef Rescue program.

The mud is applied for the plant crop and at second ratoon. It isn’t applied every year to avoid concerns about high phosphorous concentrations.

“We want to keep feeding the soil fertility across the crop cycle, which means multiple applications,” Dennis Werner said.

Dr Graham Stirling has worked with the Werners to assess some of their work as part of an SRA-funded project (2014/004) examining the role of the complex web of organisms living in sugarcane soils.

Dr Stirling said that a range of key soil health indicators have improved through the use of the mud and that it was clear visually that roots were also healthier.

In a paper published at the Australian Society of Sugarcane Technologists

Conference this year, Dr Stirling indicated that carbon levels were almost double the level in the area where the mill mud was placed compared to the untreated area.

Carbon dioxide respiration and numbers of free-living nematodes increased significantly and numbers of plant-parasitic nematodes declined by about 67 percent.

The Werners' work on mill mud – where Dr Stirling conducted his sampling – was also assessed as part of a project through the Australian Government Carbon Farming Futures program run by Farmacist at Mackay.

John Markley (Farmacist Mackay) said the results from the mill-mud trials were encouraging, but that sub-surface application of mill mud requires further research.

"In particular, there is a need to investigate the energy requirements of a sub-surface applicator when compared to a surface applicator," he said.

With the trial having a corresponding decrease in granular inputs for the mud treatment, Mr Markey said that the trial indicated that this reduction in nitrogen inputs had no impact on cane and sugar yields when compared to the industry standard application.

Farming at Septimus, the Werners grow cane on about 95 hectares and also run beef cattle.

John Werner said they were very fussy about what chemicals they used and ensuring chemicals and nutrients were kept on farm as much as possible.

"All our nutrients are buried sub-surface," he said. "The reason we built the sub-surface applicator is primarily to ensure we are farming properly for the Great Barrier Reef." ■



A snapshot of the analysis by Dr Graham Stirling from samples at the Werners after three successive years of treatment:

DIFFERENCE BETWEEN UNTREATED COMPARED TO MILL MUD TREATED

Carbon ↑

Microbial activity (measured as carbon dioxide respiration) ↑

Root health rating, dry root weight, and root surface area ↑

Plant-parasitic nematodes: root-lesion, stunt, stubby ↓

Free living nematodes (which are a useful indicator of soil health) ↑

(Over page) Dennis and John Werner with a crop of first ratoon Q240(b) that they are hopeful will cut 150 TCH thanks to their farming regime and a good break in the season after the dry summer. (Above top) The Werners' self-built sub-surface mill mud applicator. (Above bottom) Roots of cane collected in October 2016 from untreated soil (left) and soil where mill mud had been applied for three successive years (right).