



## Soil health: fitting all the pieces together

A keen interest in improving soil health has seen Tully grower Ray Zamora continue with a broad range of trials on farm. BY BRAD PFEFFER

**Tully district grower Ray Zamora knows that some of his most productive farm workers are too small to see.**

That's because they're underground, working on a microscopic level and helping to improve the overall health of his soil.

What's more, these workers don't take sick days, don't need overtime pay, and work 24 hours a day. This is why he has developed a keen interest in sugarcane soil health over the last decade and is taking all the steps that he can to improve the health of his soil.

Ray's father changed the row spacing from 155cm (five feet, four inches) to 180cm about 15 years ago, and when Ray took over about 10 years ago he widened the rows further to 190cm and also implemented zonal tillage and GPS guidance.

He was keen to have the row widths match the harvesting equipment and therefore further protect the stool and reduce compaction. He also hopes to go from zonal tillage to zero till soon.

"I expect that going to zero till will make a huge difference here, especially given the rainfall we experience at Tully. I want to be able to cut my plant cane in the first round, or whenever I want to. So to have the GPS guidance, wide rows, and zero tillage will all be a no brainer to achieve that outcome," he said.

The 110 hectares under cane, near Euramo, is on the floodplain adjacent the Murray River. This has the benefit of bringing in fertile soil, but it also creates a relentless weed problem, and in wet years with flooding early in the year, the crops suffer, especially if the previous season ran long.

To further improve soil health, he has a strong focus on cover crops, which are not only providing a valuable rotation to the sugarcane, but also helping suppress weeds during the peak season and reducing the reliance on residual herbicides.

For example, when CaneConnection visited in mid-January, he had a crop of ebony cowpea that had created a weed-free carpet over a fallow block.

"It is on pre-formed beds and when it was half-grown I did a FusiladeForte® (active: Fluazifop-P) spray because there was a fair bit of grass in the paddock, and that tidied it up beautifully. The plan after that is to roll it down and direct-drill a mix-species cover crop, and then direct-drill plant the cane a few months after that," Ray said.

"I am breaking the sugarcane monoculture. Nowhere in nature does one crop grow on its own."

He has also worked on a number of innovations through his own on-farm research and collaborations with RegenAg, Terrain NRM, Project Catalyst, and SRA.

This year he is trialling a mixed species companion crop trial through Project Catalyst, where he has sown sunhemp, sorghum sudangrass, soybean, and guar beans in the inter-rows of his cane.

"The idea is that we want to capture as much plant diversity as we can, and make the most of the available sunlight. I'm hoping the other species of plants will put their roots down and feed the biology."

He has also planted his own trial looking at skip rows planted to other species, where alternate rows are not planted to cane, but instead are planted to crops such as soybean.

While it is something relatively new and has not been the subject of rigorous trials, Ray said the concept was to use half the inputs (as half the area is planted), but with hopefully 70 percent of the yield. He said he hoped that the inter-rows planted to other crops would provide a yield benefit when they return to cane in future years.

The SRA work that Ray is involved with includes water quality monitoring as part of the SRA-funded project Protecting our Chemicals, which is run by SRA Researcher Belinda Billing.

"Once I started looking at my soil biology, I wanted to use less chemicals wherever I can, because I want to encourage the good biology to grow. So the less chemicals, the better."

With all this interest in soil health, Ray was also supportive of the recent Soil Health Masterclass held in Far North Queensland recently as part of an SRA-funded project.

At the masterclass, presentations included soil biology, fungi, bacteria, and nematodes, along with practical tips for improving soil health on farm.

"It is great to see SRA on the soil health bandwagon," he said.

He said while it was hard to measure the impacts of his work and on-farm research, he measured his results through his productivity figures and lower input costs.

"In 2015 and 2016 we topped the district in those years, and to me that is validation that we are doing something right.

Being a low farm, the dry years suit us, but you still have to have things in place to get that production. It doesn't happen by itself."

He said the recent season saw production drop back in 2017, but it also had the advantage of an earlier finish, which has set up the coming season well for the district to plant cover crops and for good establishment of ratoon crops before the wet season. ■

**For a short video of Ray's cowpea crop, visit the 'media' section of the SRA website.**

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*(Over Page - Top Left) Ray in a fallow crop of ebony cow-pea. (Over Page - Top Right) Ray on farm earlier this year with a Project Catalyst mixed species inter-row trial. (Over Page - Bottom) Ray Zamora inspects soybeans planted in his skip-row trial.*