

Establishing sugarcane farming systems for better soils and improved production

IT IS WIDELY RECOGNISED THAT IMPROVING SOIL HEALTH IN SUGARCANE FARMING SYSTEMS IS CRUCIAL TO ACHIEVING A PRODUCTIVE, PROFITABLE AND SUSTAINABLE CANE INDUSTRY. BY BEENA ANIL-BISWAS

The long-term monoculture of sugarcane has led to detrimental effects on soil health, resulting in declining cane yields.

Modern farming systems including controlled traffic, permanent beds, minimum tillage, legume break crops and crop residue retention have helped to overcome some of the adverse impacts caused by conventional management practices.

However, according to Key Focus Area Leader, Dr Barry Salter, soil health remains poor and soil carbon levels are generally low. Root systems below the top few centimetres of soil are in poor condition, with a prevalence of pathogenic organisms such as nematodes.

To address these issues, new practices that complement the modern farming system need to be explored. These practices need to deliver an improvement to soil carbon (C) and biological condition while enhancing profitable sugarcane production.

A new SRA project, *Establishing sugarcane farming systems to improve soil health*, assesses a range of practical farming practices that may improve soil condition through the addition and management of organic matter. Three

farming system trials will be conducted in the project to:

- Assess the impact of management practices that include mixed cover cropping and other management strategies such as intercropping, organic matter application and incorporation to improve sugarcane crop performance and soil condition
- Develop methods of managing intercrops to reduce competition with the developing sugarcane crop
- Quantify whether mixed species cover cropping is more beneficial than a legume monoculture
- Assess the impact of trash management (green cane trash blanketing (GCTB) compared to burnt trash) and tillage treatments (full tillage compared to zero tillage) on soil C.

The trial sites are located in the NSW, Central and Wet Tropics regions. It has been a busy time for the research team on the ground, led by SRA's Dr Barry Salter, NSW DPI researcher Dr Lukas Van Zwieten and Mr Rob Sluggett from Farmacist.

"The purpose of the project is to explore and promote new farming systems that improve soil condition, ultimately resulting in more resilient soils that are

better able to withstand stress and often require reduced chemical and other management inputs," said SRA Key Focus Area Leader, Dr Barry Salter.

"Yield response to fumigation is in order of 42 percent for plant crops and 18 percent in the following ratoon; whereas longer fallow periods have been shown to improve plant crop yields by 20-30 percent.

"This quantifies the effect that soil biological condition has on productivity. Given the magnitude of these responses, it is not unrealistic to assume that yields could be improved through the refinement of farming systems while also maintaining the principles of the Sugar Yield Decline Joint Venture, which are GCTB, reduced tillage, controlled traffic, and breaking the monoculture." ■

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(Above) Intercropping will be one of the farm practices assessed as part of a new project that has just begun at SRA.