

MIXED SPECIES FALLOWS BEING PUT TO THE TEST

TRIALS ARE UNDERWAY IN MULTIPLE REGIONS LOOKING AT MIXED SPECIES FALLOW CROPS AS PART OF SRA'S SOIL HEALTH PROGRAM OF INVESTMENT.



The benefits of fallow crops – especially legume crops – for sugarcane soil health and productivity are widely acknowledged.

But in recent years there has been interest to investigate if there are greater productivity gains to be had by looking at other break-crop options.

A number of growers have already looked at mixed species fallow crops in trials or their own on-farm experiments, but a new project is looking at this fallow option over several years at sites in New South Wales, Mackay and the Wet Tropics.

The project is called *Establishing sugarcane farming systems to improve soil health* and is led by Dr Barry Salter at SRA and run in collaboration with Mr Rob Sluggett from Farmacist and Dr Lukas Van Zwieten from New South Wales Department of Primary Industries.

The mixed species fallow crop trials are one part of the project, which is also looking at other aspects of the

farming system including sub-surface organic matter application, intercropping trials and long-term green cane trash blanketing. The project is part of SRA's Soil Health Program of investment, which is a 10-year commitment from SRA to improve adoption and extension around the industry's soil health.

NSW grower Robert Quirk is one of the growers with a trial site on his farm for the mixed species fallow, and said he was keen to learn more about something that was novel to NSW.

"I've tried a number of different practices here over the years such as intercropping and skip row, and had some good results, so I am keen to see where this mixed species trial goes," he said.

He said that soybean fallows had widespread adoption across the three NSW mill areas, and were often an important cash crop to the region, but that this trial would provide valuable information on alternative fallows with a focus on cane production, and would add

value to information collected in other regions.

He said it was useful to understand if other fallow options, even if they were not taken through to harvest, offered greater benefits to the soil health and the sugarcane farming system.

In the trial, the mixed species fallow crop will be compared to bare fallow, as well as a mixed species cover crop plus intercropping.

Cane will be planted this year at the sites and yields and various measures of soil condition will be assessed across the harvests of 2020, 2021, and 2022. Results will be communicated to the industry as the project continues.

Robert Quirk said soil health was crucial at his property, as he had faced huge problems with acid sulphate soils over the years.

To combat this problem, he has implemented a broad range of practices at his farm including laser levelling,

IT WASN'T LONG AFTER ROBERT QUIRK STARTED FARMING THAT HE KNEW HE HAD A PROBLEM.

It was the late 1960s and Robert and his brother had recently finished school and converted the Tweed Valley farm from a dairy to sugarcane. Robert and his brother farm separately but share equipment, and say that this practice has been the strength of the NSW sugarcane industry for many years.

Their early years of farming cane yielded good results, but within about 10 years they saw yields declining as they faced major problems with acid sulphate soils. Their farms are just half a metre above sea level and confront regular floods from the nearby Tweed River. The farm sits above a shallow groundwater table.

Before starting cane farming, flood gates and levees had been built on the property, but these had created their own problem with mineral oxidation. Robert said their soil pH was as low as 2.6, with a severe acid problem. "We had the equivalent of about 10 litres of sulphuric acid per square metre, or 100 tonne per hectare over the 100 hectares," he explained.

Not only was productivity severely impacted but there was also public scrutiny on the problem.

Over time, along with the rest of the industry in NSW, he has embarked on a series of measures to combat the problem and create a sustainable farming system. The work of the industry on tackling this challenge is a significant success story for the industry in NSW.

For Robert, he has laser levelled blocks, uses lime regularly, and harvests green as much as possible. He uses minimum tillage and legume fallows and regularly soil tests to only use replacement quantities of urea.

"We developed a drainage management plan. We also have had to deal with the wet weather and have pumps that can move about four megalitres per hour off the farm in wet times. So we can handle about 50mm of rain per day and not sustain too much damage."

Through all this work, he said he maintains the water table at minus 600mm, which gives the roots a better environment and has improved soil pH.

He said he had increased organic carbon content from about 2 percent to over 5 percent in surface soils.

He added that between the environmental outcomes and improvement in sugarcane productivity, the investment was well worth the effort.

"The sustainable yield and improvement in soil characteristics justified the additional work and expense of the improved soil management practices."

Robert presented some of this work at the European Geosciences Union conference in April in Vienna.



(Over page) Mixed species fallow crop trial on Robert Quirk's farm in January 2019. (Right) Robert is a keen participant in a range of research trials at his farm on the Tweed River.