

Growers should consult their local productivity advisor around the use of mill by-products and what further nutrients may be required for their crop. The SRA Australian Sugarcane Nutrition Manual also has information on indicative amounts of nutrients in mill by-products, and this publication is available free for growers by calling 07 3331 3308.



# Looking at how mill by-products stack up

TRIALS AT HARWOOD IN NSW HAVE LOOKED AT COMPOST AND MILL BY-PRODUCTS AND EXAMINED FACTORS SUCH AS YIELD AND NEMATODE POPULATIONS.

**Alan Munro has been a long-term user of mill mud at his farm at Woodford Island in the southern stretches of the Australian cane industry.**

He sees that it has been one component of his farming system that is contributing to better soil health and improving the efficiency of his nutrient management.

Having seen the potential from mill mud sourced from the nearby Harwood sugar mill, he also wanted to learn how mill by-products compare to compost and also to a straight urea regime, as well as their impact on soil health and nematode populations.

With this in mind, he recently worked with Sunshine Sugar and then with Dr Graham Stirling (Biological Crop Protection) in trials that looked at a range of mud/ash, compost and urea treatments.

The work began as an initiative of Sunshine Sugar in 2012 to determine yield responses to banded mill mud or banded compost. At the time, Sunshine Sugar was starting to trial compost manufacturing.

Subsequent work was undertaken through a now-concluded project funded by SRA, called *Regenerating a soil food web capable of improving soil health and reducing losses from soil-borne pests and pathogens*, which was led by Dr Stirling. This trial was done in conjunction with Dr Anthony Young, Rick Beattie from Sunshine Sugar, and soil scientist Bob Aitken.

Results were published in a paper at the Australian Society of Sugarcane Technologists (ASSCT) conference in 2018, and while the study was a short term trial (one harvest), the researchers said that it made some important findings in relation to the increases in soil organic carbon and the potential to reduce some parasitic nematode populations.

"Amending the soil with organic matter had major effects on plant crop yields in this trial, as the highest rates of mud/ash and compost increased yield... relative to the no urea control," they wrote in their paper.

"The two lowest rates of compost or mud/ash did not increase cane or sugar yield relative to the control (no urea) treatment. However, higher rates of

both the amendments significantly increased yield and there was a clear trend for increasing cane yield as the amendment rate increased."

At the higher rates of compost (66t/ha) and mud/ash (90t/ha), the top urea rate (230kg N/ha) performed slightly better.

Rick Beattie from Sunshine Sugar said that a valuable part of the trial was that they were able to determine top-up nitrogen rates to use with different rates of banded mill mud.

The researchers also noted that the long-term impacts, while not assessed in this trial, were important to consider.

"Soil organic matter has a profound effect on soil physical, chemical and biological properties and the decline in soil carbon levels that has occurred in sugarcane soils over the last 100–140 years is a major reason they are now in relatively poor condition. Many cane growers are now trying to improve the health of their soils by adding amendments such as mill mud and compost and the data obtained in this study demonstrates that



such practices can improve organic matter levels in the soil.”

The experiment also suggested that there was a positive impact on soil biology.

The two highest rates of mud/ash and compost had the lowest populations of root-lesion nematode, a pest that commonly reduces the yield of plant crops by 10–20 percent.

Alan Munro said that one of the key messages for him was the importance of considering the economics, given that the standard urea rate produced slightly higher yield.

“But there is also evidence that organic inputs are improving the soil and helping with a positive impact on nematode populations. So the messages for me were that there is more to learn over the long term; that there is nothing wrong with growing cane with straight urea; and for us we had to go in at 50t/ha with the mill mud or compost to get a response.”

There are several projects and activities currently underway looking more closely

at mill by-products and their relationship with soil health.

These projects are part of the broader Soil Health Program occurring at SRA, with information on these projects and their findings available under a new ‘soil health’ section of the SRA website.

Current work underway in the Burdekin and Herbert has reinforced the importance of carbon inputs – such as mill mud or crop residue – for soil biology improvement.

Soil biology is key to productive healthy soils and soil microbes are responsible for converting complex organic compounds such as crop residues, mill mud and soil organic matter into nutrients that are available to the crop.

Alan farms on 1.8 metre rows and also uses minimum till strategies for his cane and soybeans, after work across the NSW region to investigate improved farming systems.

“The economics of the whole system with the beans and reduced tillage have

stacked up. We are able to sell our beans to a buyer in Casino, generate cash, reduce our tillage, and we reduce our nitrogen applications for the following cane crop.” ■



*(Above left) Alan Munro checks over beans in mid-January, hanging on through a long dry spell. (Above right) Alan with cane that will be cut as two-year old later this year.*