

Project Catalyst

Case study



Growers investigate various rates and application of mill mud across four sites

BACKGROUND

Mill mud is a commonly used ameliorant in the Australian sugarcane industry for a multitude of reasons. Mill mud contains a high percentage of organic carbon, organic nitrogen, phosphorus, potassium and calcium, all of which are essential for plant growth. Mill mud also can improve soil health through better water retention, improving the Cation Exchange Capacity of the soil, soil texture, soil structure and soil biology. Conventionally, mill mud is traditionally applied directly into the irrigation furrow at an application rate of up to 200 wet tonnes per hectare (t/ha), however, due to logistical expenses, distance from the mill can be a barrier to applying mill mud/ash throughout the region due to an increase in haulage costs and the time it would take to complete a paddock at those rates. The ability to facilitate mud applications further from the mill on previously untreated areas would result in improved productivity for the region, and reduce the associated environmental risks resulting from over-application of the product close to the mills.

THE TRIALS

In 2014, four trial sites were established in the region that aimed to investigate various rates and application positions compared to conventional practices. The sites were spread throughout the Burdekin on various soil types and localities. Regions included Clare and Giru, as well one site near the Pioneer mill and the other near the Kalamia mill. On each of the sites, mud was spread conventionally at two different rates, 200t/ha and 100t/ha. Three of the four sites included a 65t/ha banded mill mud treatment where mud was applied on the hill instead of the water furrow, and one site contained banded mill mud at 120t/ha. Every site was compared against



Chris Hesp

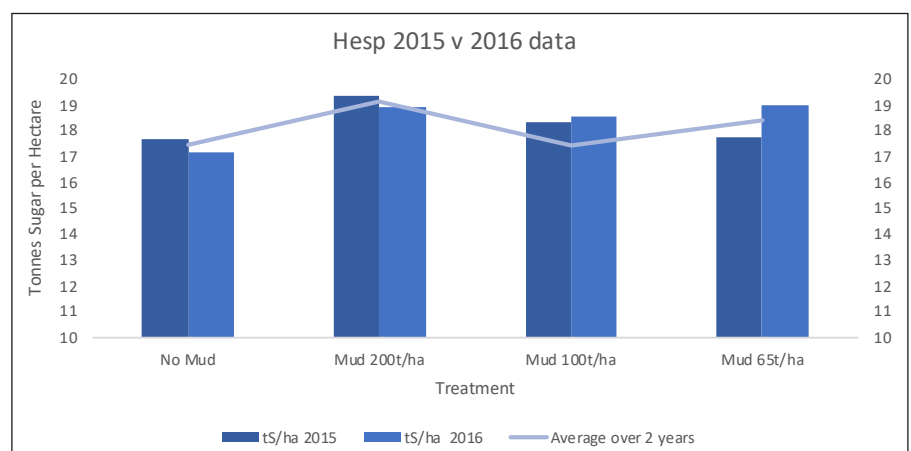
a control treatment where mud was not applied. Nitrogen and phosphorus was reduced based on the SIX EASY STEPS methodology. The results for all sites are summarised below.

Site 1 - Hesp

Results showed that in the first year, the higher application rate outperformed all other treatments in tonnes of sugar per hectare. However, in the following year, all

of the mud treatments, irrespective of rate and position, outperformed the control.

When comparing the results over two years of data at Chris Hesp's results showed that there was no significant difference in sugar production between any of the mud treatments showing that applying lower rates on the hill is a viable option. This also allows significantly reduced cartage costs thereby facilitating the adoption of mud application further from the mill.



Graph 1 - 2015 and 2016 data from the Hesp site showing tS/ha

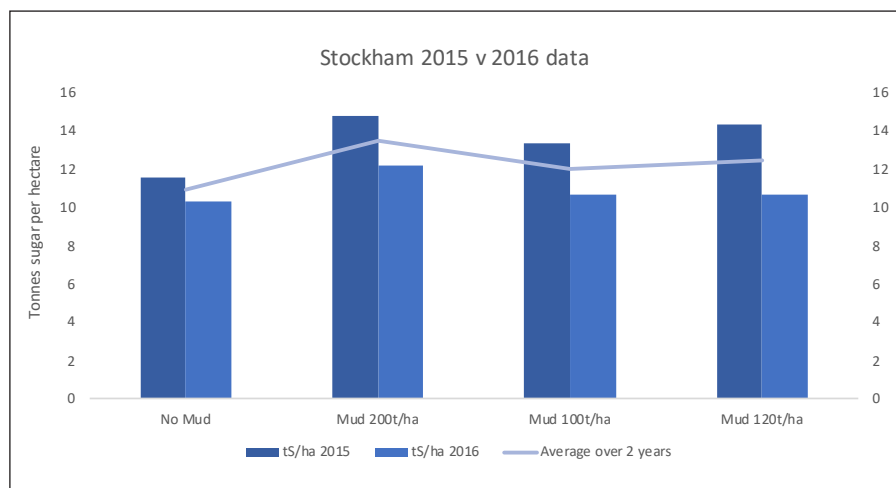
What it's about

Project Catalyst is a grower-led innovation project in sugar cane that was formed to explore and validate farm management practice change leading to improved water quality for the Great Barrier Reef. For more information on Project Catalyst please visit our website <https://www.projectcatalyst.net.au/> or phone Catchment Solutions on 07 4968 4216.

Site 2 - Stockham

In the first year of mud application, all mud treatments, regardless of rate and position, performed better than the control in sugar production. However, in the second year, even though there were trends of better sugar production where mud was applied, due to the variation in replicates, no significant difference could be determined.

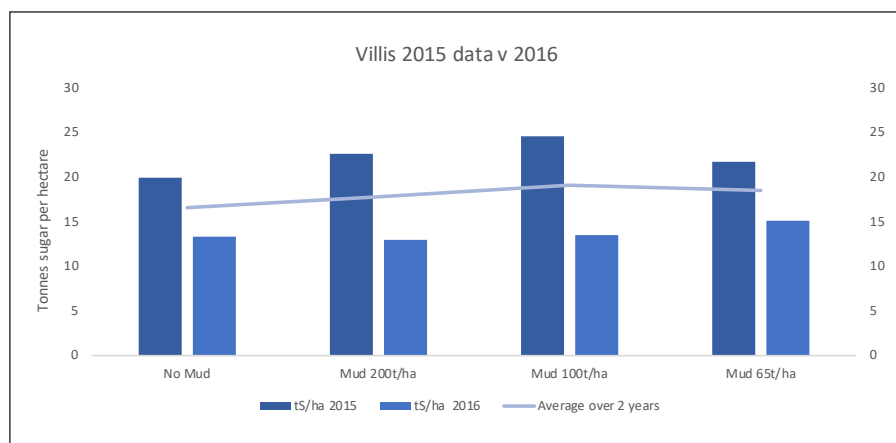
When examining the summary of two years of data on this farm, there was no significant yield difference in any of the treatments due to treatment variability. However all treatments that had mud applied were found to perform on average 2 tS/ha better than the control.



Graph 2 - 2015 and 2016 data from the Stockham site showing tS/ha

Site 3 - Villis

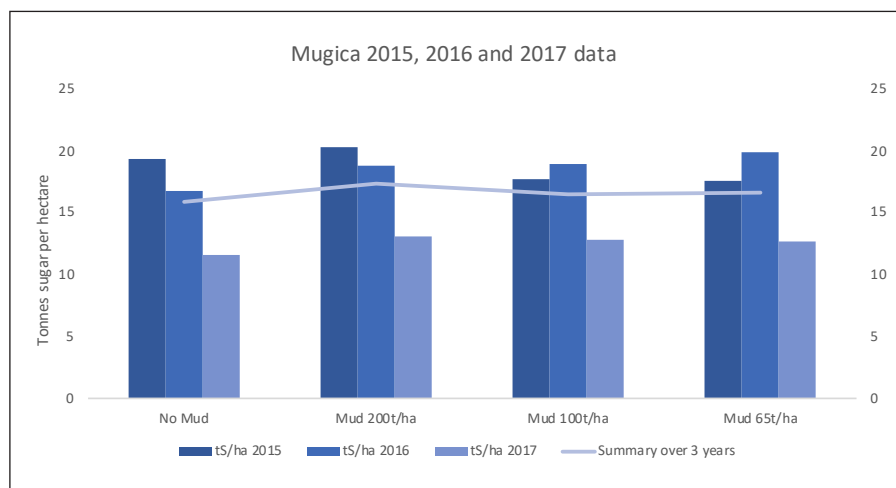
Although improvements in sugar production ranged between 1.9 – 4.8 in 2015, additional tonnes of sugar where the mud was applied, due to treatment variation again, no significant differences could be reported. In 2016 and when we compared the average of the two years combined, no significant difference in sugar production could be determined. Importantly however, the reduced rate of mud applied on top of the hill did not perform differently to the 200 wet tonnes per hectare applied in the interrow.



Graph 3 - 2015 and 2016 data from the Villis site showing tS/ha

Site 4 - Mugica

This site was continued for 3 years in comparison to the other sites which were only continued for two years. When looking at the yield data tS/ha, the 2015 data for the 65t/ha shows some anomalies. This low yield result was due to the blocking of the fertiliser applicator during application. Results showed that even after three years after application, all treatments that had mud applied outperformed the control between 8-10t/ha. On average over 3 years of data, there was between 6 and 10tonne increase in tonnes of cane per hectare.



Graph 4 - 2015, 2016 and 2017 data from the Mugica site showing tS/ha

DISCUSSION

While the sites had variable results throughout the multiple years of the trials, it was found that banding mill mud is a viable option for the application of mill mud in the Burdekin region for both sugar production and logistical costs. Since these trials have finished, three contractors in the Burdekin are now set up to apply banded mill mud, with demand increasing more and more every year. Recent communication with contractors found that banded mill mud is being applied most commonly at 100t/ha,

which works out to be 45% cheaper than 200t/ha conventionally applied mill mud based off a 10ha paddock that is near the mill. Comment was also made to the fact that it was easier for the drivers to apply consistently, especially when it is applied as dry mud instead of wet mud.

Optimisation of inputs is critical with rising water and electricity costs. Banding mill mud at lower rates can significantly reduce input costs without penalising yields whilst still providing essential nutrients, improved soil benefits and additional

water holding capacity for the soil. Newly imposed reef regulations also state that broadcast application of mill mud must only occur during a fallow period where it can be incorporated into the soil and all applications throughout the crop must be banded. Results of these Project Catalyst trials provides confidence that banding mill mud on top of the hill can provide the same benefits as applying within the furrow, especially in marginal soil where nutrients and water holding capacity is low.



Rob Stockham



Paul Willis



Frank Mugica



Australian Government



Great Barrier
Reef Foundation



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