

# Project Catalyst Trial Report

## Sub Surface Mill Ash Application

### Grower Information

Grower Name:	Joseph Marano
Entity Name:	Marano Farming
Trial Farm No/Name:	50164
Mill Area:	South Johnstone
Total Farm Area ha:	550
No. Years Farming:	30+
Trial Subdistrict:	Moresby
Area under Cane ha:	393

### Trial Status:

Completed

## **Background Information**

**Aim:** Improve soil carbon and reduce applied nitrogen to our sugarcane crops

### **Background: (Rationale for why this might work)**

Want to know if it is better for longevity of the response to apply mill mud/mill ash/compost on top of the stool or below the soil surface in very low organic carbon soils.

Currently at the end of the crop cycle we fully cultivate blocks to incorporate mill by-products. If we could apply these products at a depth of 400mm prior to planting we would be able to accurately determine the rate applied as well as implement a zonal tillage farming system.

Application rates will be determined from our detailed nutrient management plan based on soil type, soil test results and block history for all plant blocks to increase organic carbon levels as well as provide valuable nutrients such as Nitrogen, Phosphorous, Potassium, Calcium, Magnesium and Silicon.

By applying rates around 50 wet tonnes of product below the soil surface we will reduce nitrogen rates by eliminating top dressing of plant cane and reduce applications in subsequent crops.

### **Potential Water Quality Benefit:**

This project will lead to water quality benefits by incorporating slow release mill by-products into our farming system as a substitute for high analysis synthetic fertiliser. We currently farm almost 400 hectares on soil with very low organic carbon levels. We have shown that by adding mill mud, mill ash or compost to our soil prior to planting we can reduce our applied fertiliser as well as produce a high yielding crop with very good nitrogen use efficiency values

### **Expected Outcome of Trial:**

Increased soil organic carbon, reduced application rates of bagged nitrogen, improved crop yields and ratoonability

### **Service provider contact:**

CANEGROWERS Innisfail, Peter Becke

### **Where did this idea come from:**

Previous work Joe has done on his farm

Industry Advisory staff

Trial work done in other districts

<b>Plan - Project Activities</b>	<b>Date : (mth/year to be undertaken)</b>	<b>Activities :(breakdown of each activity for each stage)</b>
<b>Stage 1</b>	<b>April 2018</b>	Plan trial design and location 3 reps x 3 treatments Soil sample fallow Apply mill by-product and bedform
<b>Stage 2</b>	<b>August 2018</b>	23/8/18 - Plant block and fertiliser according to NMP
<b>Stage 3</b>	<b>August 2019</b>	Harvest trial
<b>Stage 4</b>	<b>October 2019</b>	Fertilise ratoons
<b>Stage 5</b>	<b>October 2020</b>	Harvest trial

<b>Project Trial site details</b>	
<b>Trial Crop:</b>	Sugarcane
<b>Variety: Rat/Plt:</b>	Plant
<b>Trial Block No/Name:</b>	2
<b>Trial Block Size Ha:</b>	6.85ha
<b>Trial Block Position (GPS):</b>	<a href="#">-17.616689, 146.078206</a>
<b>Soil Type:</b>	Brosnan

**Block History, Trial Design:**

T1- R1	T2 – R1	T3 – R1	T2 – R2	T3 – R2	T1 – R2	T3 – R3	T1 – R3	T2 – R3
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**Treatments:**

**T1** – No Mill Ash

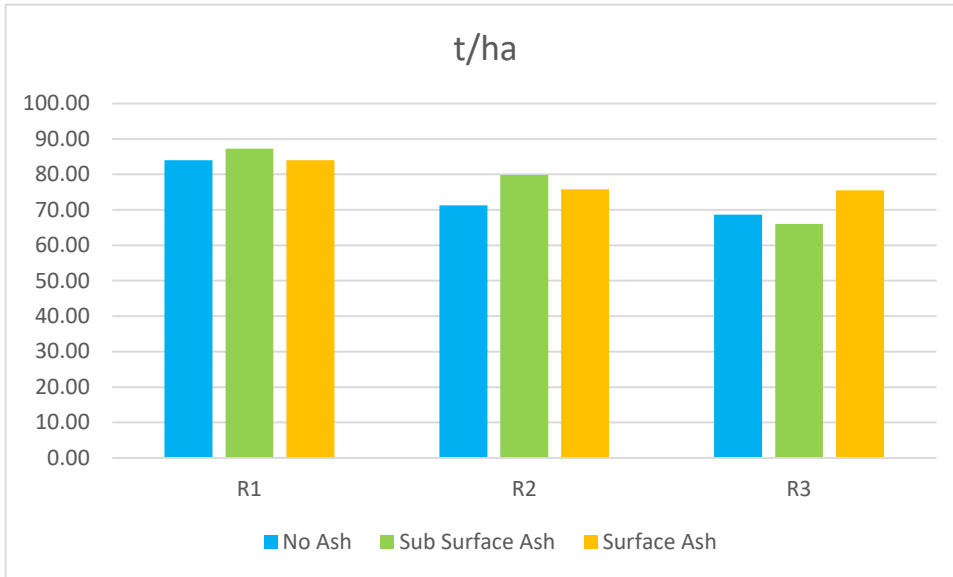
**T2** – Sub Surface banded Mill Ash

**T3** – Surface Banded Mill Ash

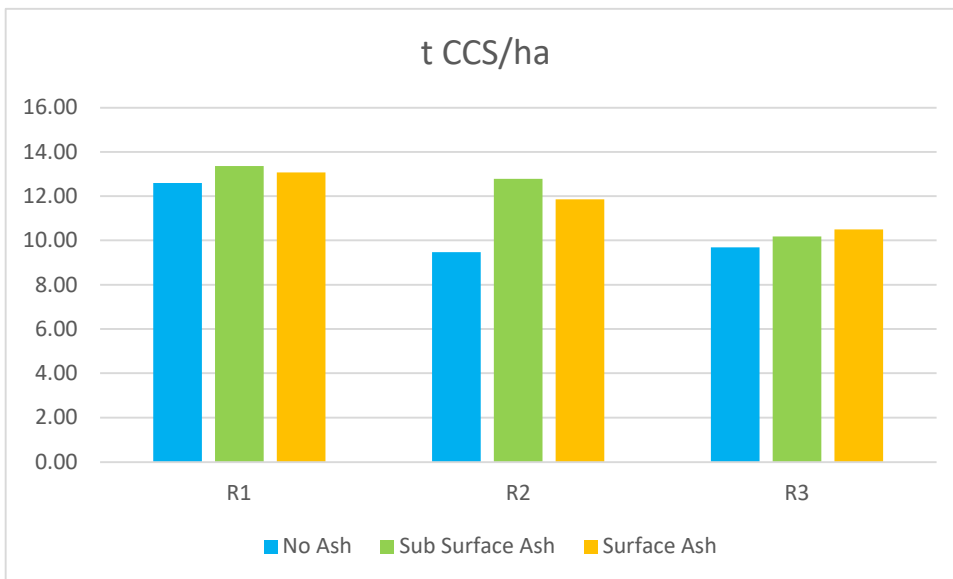
Three 6 row replicates

## Results:

### 2019 Harvest Results:

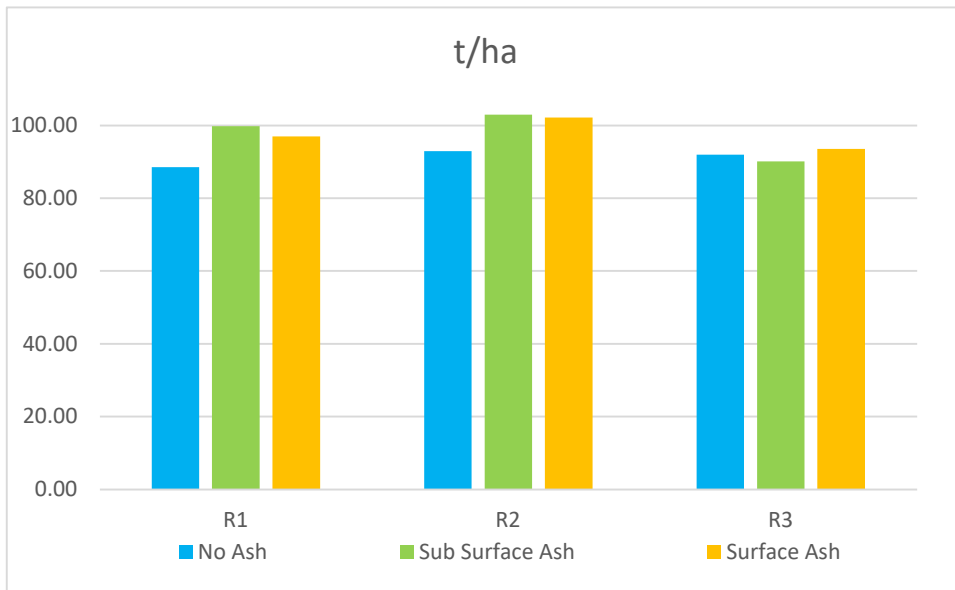


No significant difference in cane yield between treatments at 95% confidence interval.  
Significant difference in yield between replicate at 95% confidence interval.

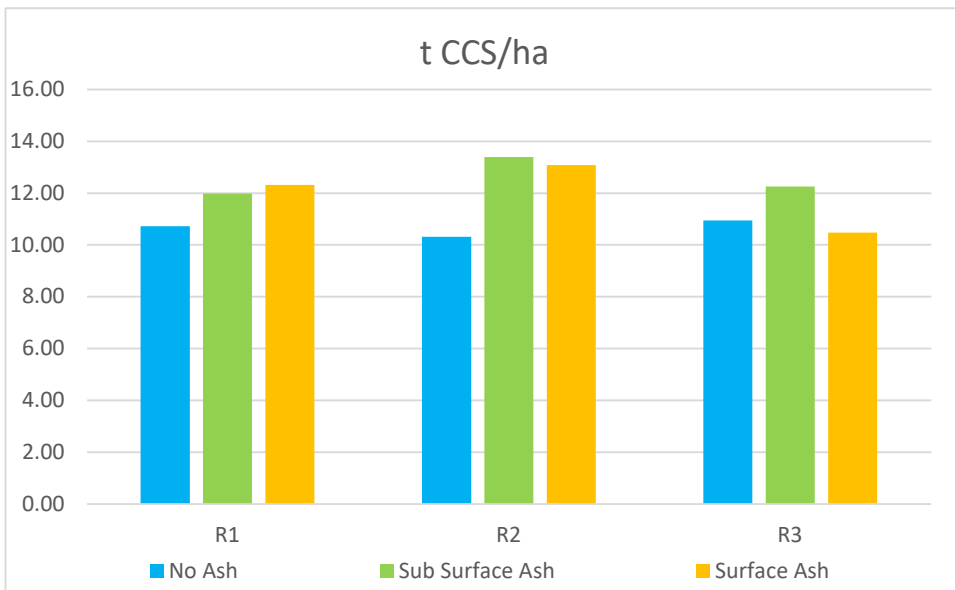


No significant difference in CCS yield between treatment or replicate at the 95% confidence interval.

**Harvest Results 2020:**



No Significant difference in cane yield (t/ha) at the 95% confidence interval.



No Significant difference in CCS yield (tCCS/ha) at the 95% confidence interval.

**Average Treatment Results:**

	t/ha		CCS		t CCS/ha	
	2019	2020	2019	2020	2019	2020
No Ash	74.6	91.2	14.1	11.7	10.2	10.7
Sub Surface Ash	77.8	97.6	15.6	12.9	11.9	12.5
Surface Ash	78.4	97.6	15.0	12.2	11.8	12.0

**Conclusions and comments**

Although not stastically significant, the mill ash treatments on average have performed better than the no ash treatment in both plant and first ratoon. The method used to apply the subsurface ash treatment did not work as well as hoped and the ash was only shallow banded and was visible on the surface in parts of the trial. Going forward Joe is looking for better subsurface applicators to get the ash banded deeper in the soil profile to properly assess the benefits of deep banded mill ash on his farm.

**Advantages of this Practice Change:**

It is hoped that the sub surface applied mill ash will remain effective longer into the crop cycle.

**Disadvantages of this Practice Change:**

Specialised equipment is required to band mill ash below surface.  
Ground work to apply the Mill Ash sub surface is time consuming.

**Will you be using this practice in the future:**

Yes to continue assessing.

**% of farm you would be confident to use this practice :**

Still assessing the practice and therefore at this stage only at trial scale.