

# Catalyst Project Report

## Grower Information

<b>Grower Name:</b>	Alan and Karen Matsen, son Grant Matsen
<b>Entity Name:</b>	CLEARACRE PTY LTD
<b>Trial Farm No/Name:</b>	MKY-04670A
<b>Mill Area:</b>	Mackay Sugar
<b>Total Farm Area ha:</b>	474
<b>No. Years Farming:</b>	More than 40 years – 3 <sup>rd</sup> generation
<b>Trial Subdistrict:</b>	Dawlish
<b>Area under Cane ha:</b>	414

## **Background Information**

### **Aim:**

**To compare crop nutrient uptake and run off between applying mud Sub-surface vs Surface**

### **Background:**

Alan and Grant Matsen (Figure 3) were wanting to lift their farms productivity through robust sustainable practices, that would ensure the farms future viability for the following generations. While investigating ideas, the Matsens heard about some promising yield results in cereal crops in Victoria, after animal manure had been buried below the surface.

Initially the Matsens sourced chicken and cow manure for their own farm, however this proved to be economically unviable. Therefore, the decision was made to trial sub surface applied mill mud instead.

The burying of soil ameliorants below the surface of the soil can have the potential to improve soil qualities further down the profile, increase organic carbon levels and potentially expand the top soil and root zone. The deep placement of ameliorants also reduces the likelihood of run off, promotes microbial activity and has the potential to increase a crops nitrogen use efficiency (NUE).

Three treatments were applied

T1- No mud

T2- Mill mud @ 100t/ha was band applied in open furrows and then bed formed

T3- Mill mud @ 100t/ha was and surface applied and incorporated into the soil

KP water event samplers, which automatically collects samples at pre-set intervals during a 'water' event, were placed in each treatment. The samples collected will then be tested for nutrient run off.

A soybean crop (A6785) was planted in December 2017, this crop will be taken through to seed. A plant cane crop was then planted in May 2018.

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

**Reduce the risk of nutrient and sediment movement off site**

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

**Improved soil structure, increased yield in treatment zones**

**Service provider contact: Farmacist**

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

<b><u>Plan - Project Activities</u></b>	<b>Date : (mth/year to be undertaken)</b>	<b>Activities :(breakdown of each activity for each stage)</b>
<b>Stage 1</b>	<b>October 2017</b>	Collect soil samples and mill mid samples for analysis. Install KP samplers to measure water quality in runoff Mill mud applied
<b>Stage 2</b>	<b>April 2018</b>	Soybean biomass samples
<b>Stage 3</b>	<b>March/April 2018</b>	Soybean harvested
<b>Stage 4</b>	<b>May 2018</b>	Sugar cane planted
<b>Stage 5</b>	<b>September 2019</b>	Sugar cane harvested

Project Trial site details	
<b>Trial Crop:</b>	Soybean and sugar cane
<b>Variety: Rat/Plt:</b>	Soybean – A6785
<b>Trial Block No/Name:</b>	MKY-04670A-08-02
<b>Trial Block Size Ha:</b>	6.05 ha
<b>Trial Block Position (GPS):</b>	149.15002, -21.400047
<b>Soil Type:</b>	Sunnyside soil – Deep soil with a sandy to loam topsoil over a grey to brown clay

The trial site was EC mapped to determine the location of soil boundaries (Figure 1). With zone 1 having the lowest reading and zone 5 having the highest. High EC readings are often associated with soils that are heavier in texture and can have drainage issues, while lower EC values often indicate lighter textured soils with good drainage properties.

The trial paddock had no previous mud applications. The whole paddock was ripped before the mud application and the sub surface treatment areas received an additional rip to create the open furrow. Mill mud was then banded on top of the furrow (Figure 4) using a specialised spreader (Figure 5) and covered over with topsoil.

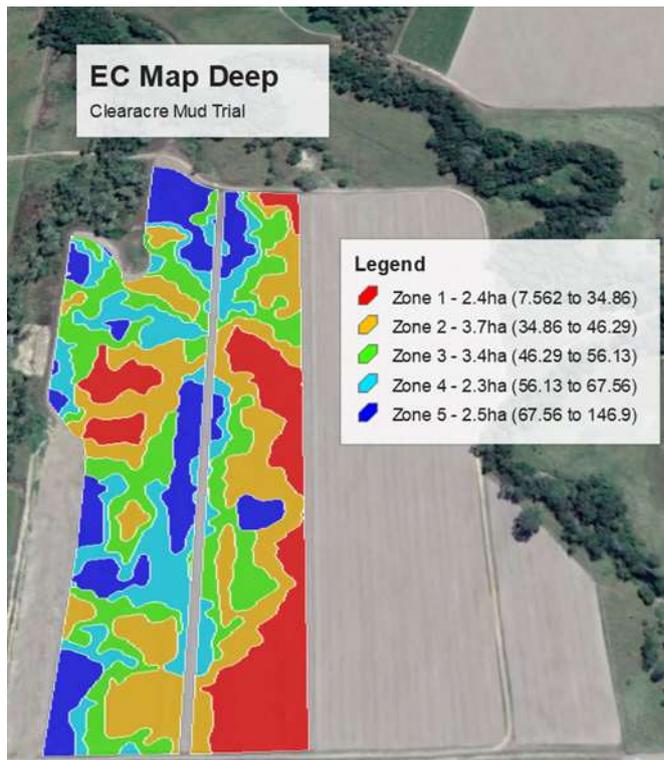


Figure 1 - EC Map of trial paddock (Red indicating lighter soil and dark blue indicating heavier soil)

### Block History, Trial Design:

Three treatments were applied to the paddock and repeated three times as shown in Figure 13 below.

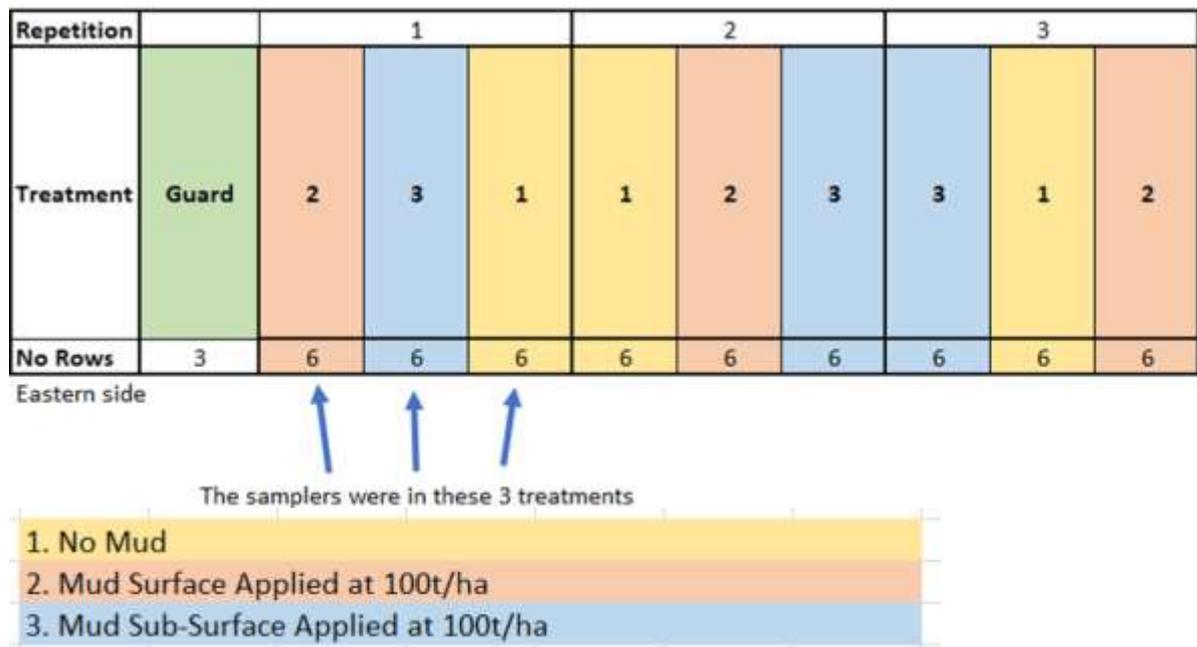


Figure 2 - Field layout with treatments and repetitions



Figure 3 - Grower Alan Matsen



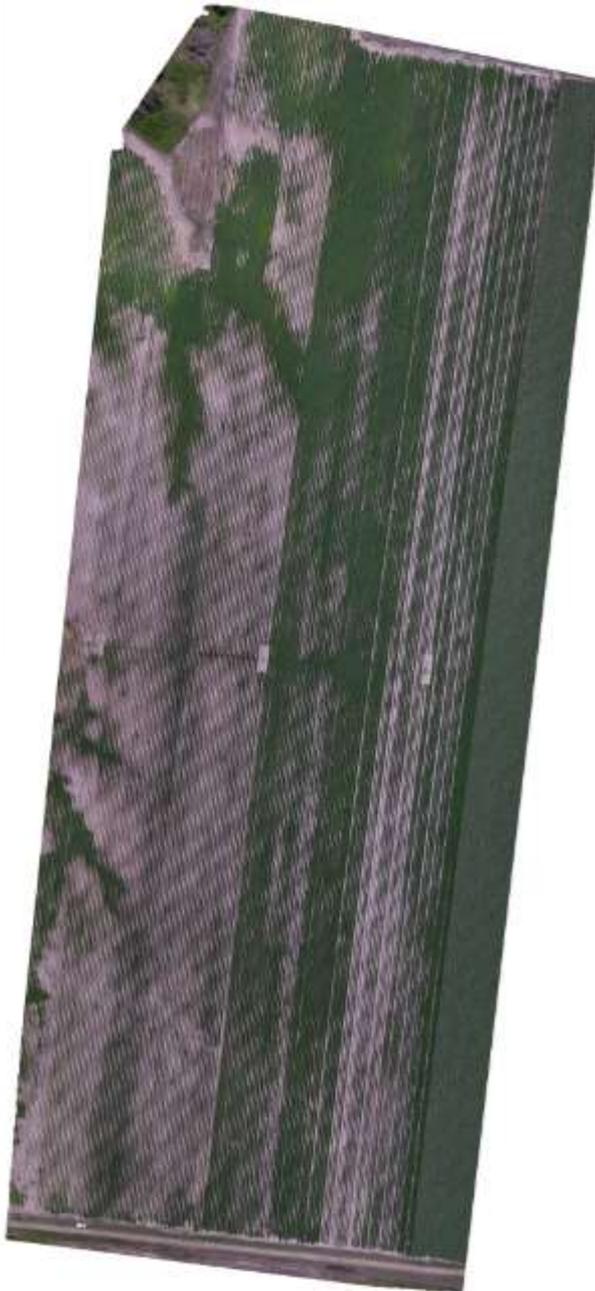
*Figure 4 - Mill mud distribution*



*Figure 5 - banded spreader used to apply mill mud*

## Results:

A soybean crop was planted 28 December 2017, however, due to planter malfunction and paddock influences, the crop was extremely variable as shown in Figure 6 below. Due to this factor, soybean samples were considered unreliable and were not included in the trial data.



*Figure 6 - Aerial image of soybean planted in December 2017*

### Leaf samples 2019

Leaf samples of the sugarcane were taken in March 2019, following the standard third leaf sampling protocol. Results are shown in Figure 7 and indicate slight variations between treatments that had the mill mud applied versus the control. Of all nutrients, nitrogen showed the largest variation between treatments.

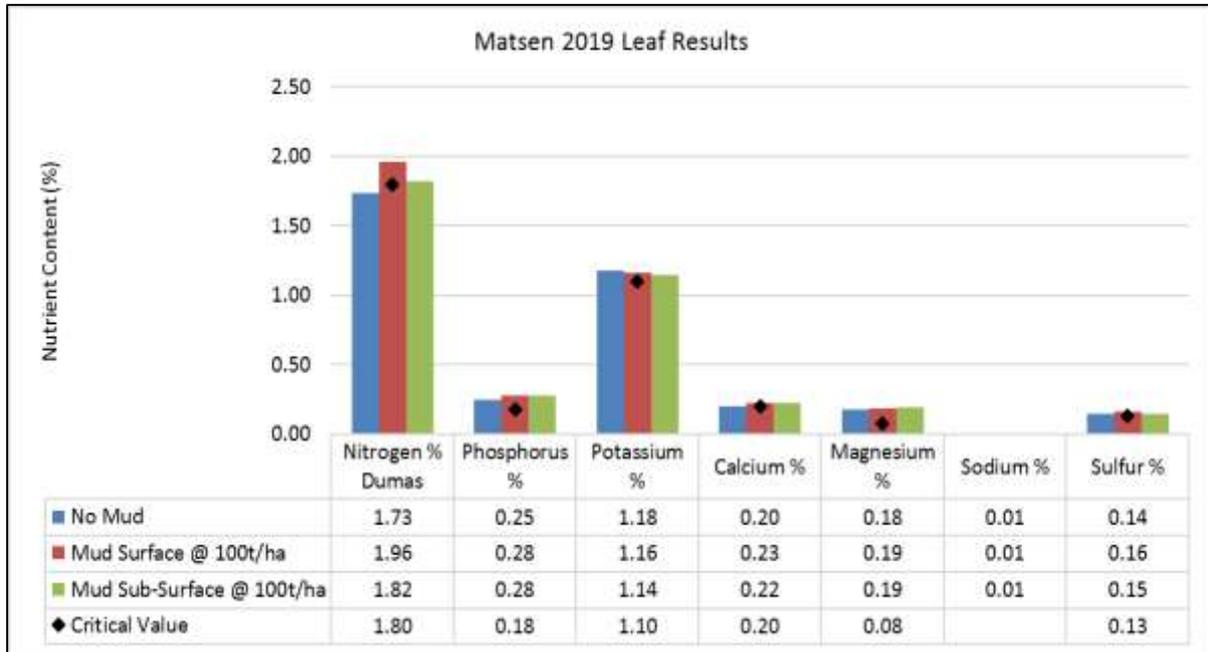


Figure 7 Leaf test results 2019

## Conclusions and comments

Sugar cane was planted in 2018 and yield will be collected when harvested in 2019.

### **Advantages of this Practice Change:**

Applying the mud subsurface should reduce its risk of exposure to the environment.

### **Disadvantages of this Practice Change:**

Extra cost involved in applying the product subsurface.

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

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

**Site continuing 2019**

