

Catalyst Project Report

Grower Information

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

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

Project Trial site details	
Trial Crop:	Soybean and sugar cane
Variety: Rat/Plt:	Soybean – A6785
Trial Block No/Name:	MKY-04670A-08-02
Trial Block Size Ha:	6.05 ha
Trial Block Position (GPS):	149.15002, -21.400047
Soil Type:	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.

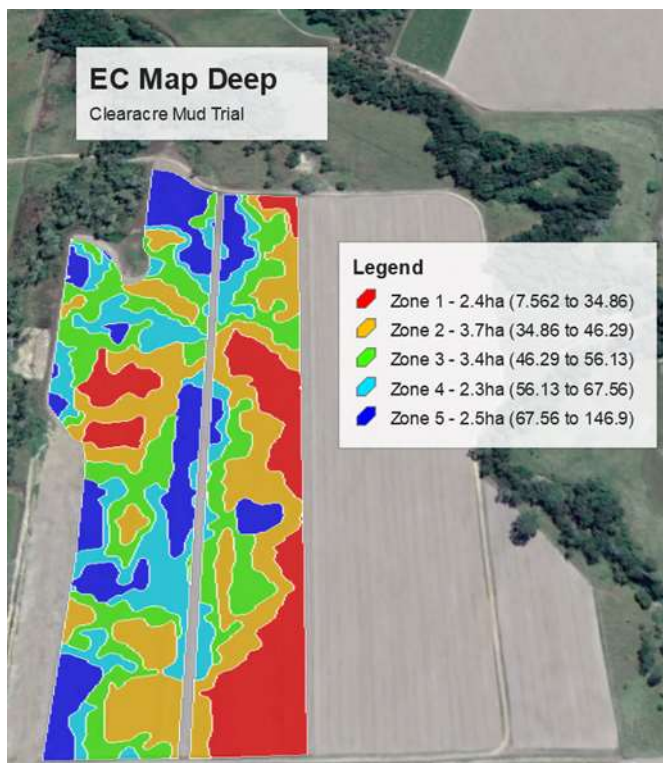


Figure 1 - EC Map of trial paddock (Red indicating lighter soil and dark blue indicating heavier soil)

Block History, Trial Design:

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

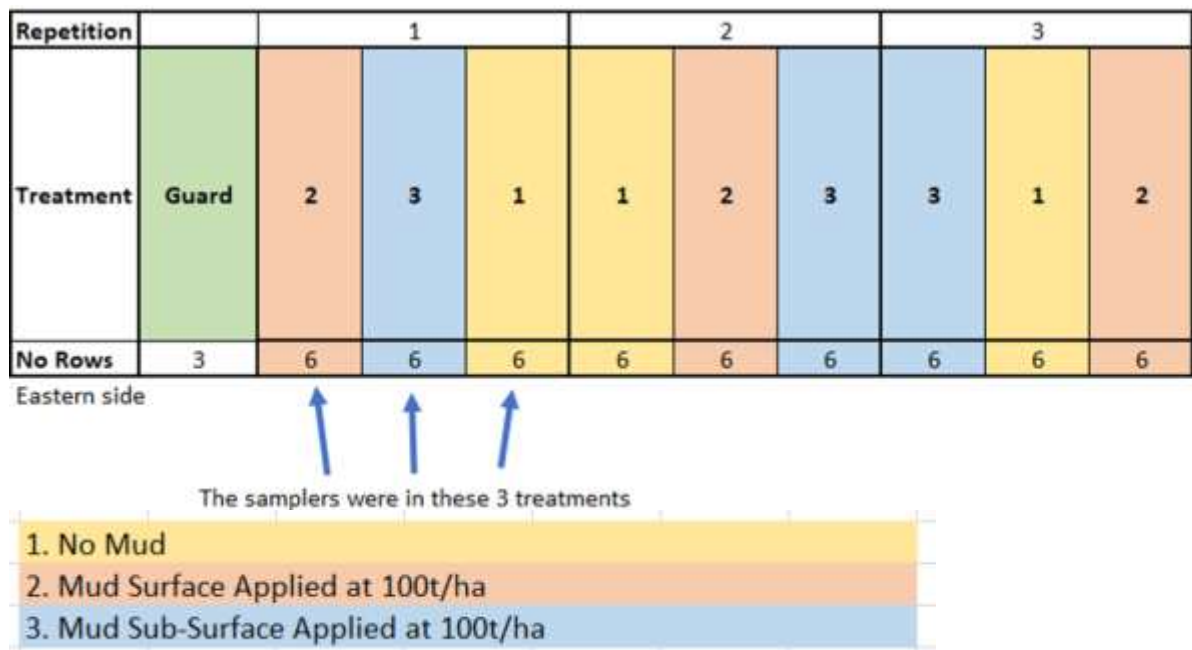


Figure 2 - Field layout with treatments and repetitions



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.

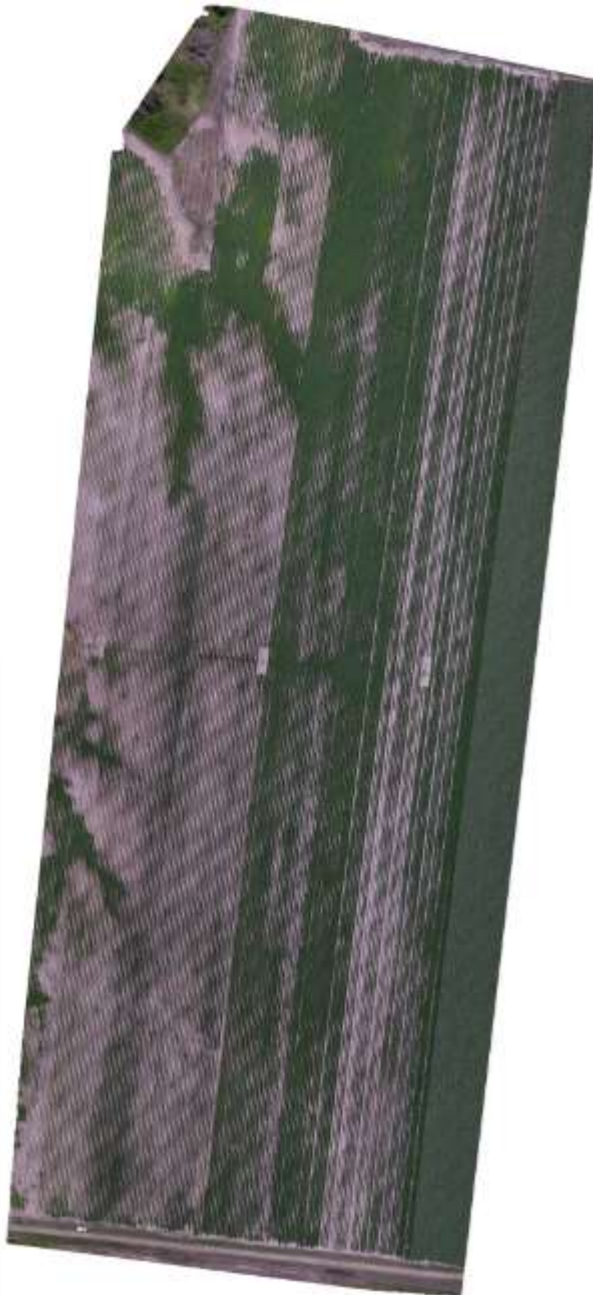


Figure 6 - Aerial image of soybean planted in December 2017

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.

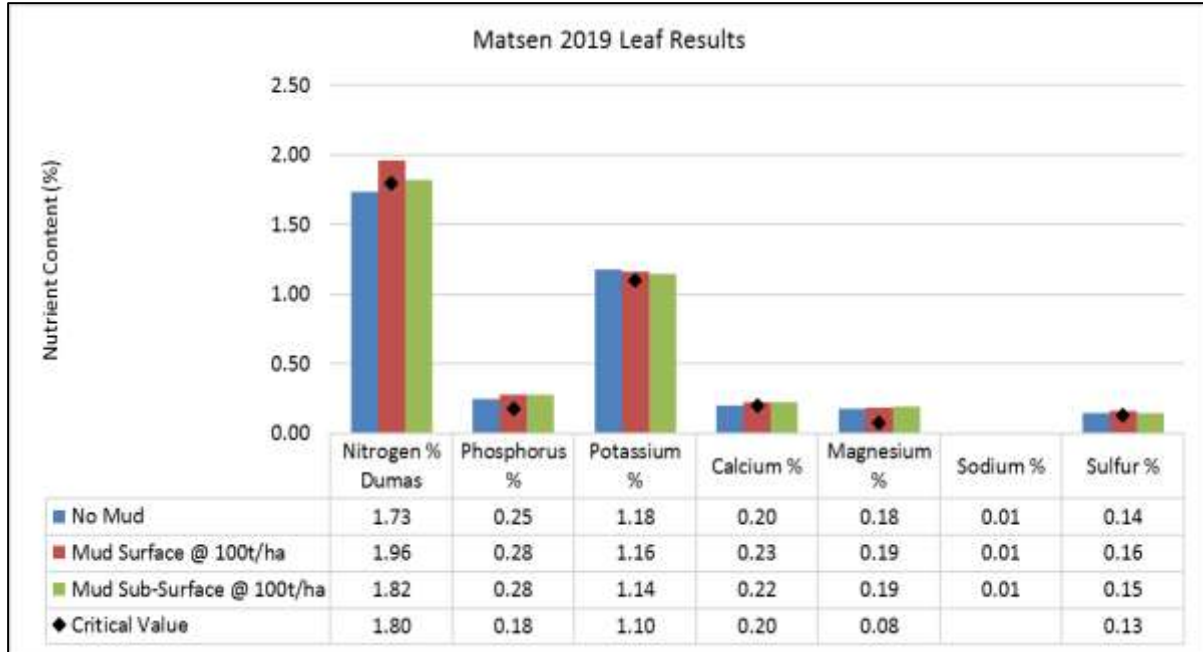


Figure 7 Leaf test results 2019

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

