

# Catalyst Project Report

## Trialling Different Ameliorant Methods to Improve Poor Soakage

### Grower Information

<b>Grower Name:</b>	Mark Castalanelli
<b>Entity Name:</b>	
<b>Trial Farm No/Name:</b>	
<b>Mill Area:</b>	
<b>Total Farm Area ha:</b>	
<b>No. Years Farming:</b>	
<b>Trial Subdistrict:</b>	
<b>Area under Cane ha:</b>	

## Background Information

**Aim: To compare different methods of amelioration to improve soakage across beds during furrow irrigation.**

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

Furrow irrigation is used on approximately 95% of farms in the Burdekin. In this method, the water is applied down furrows (space between the beds) and the water needs to both reach the end of the paddock and soak across to the center of the bed for effective irrigation. When the water doesn't soak across, this is described as poor soakage.

This is an issue for a large number of Burdekin growers. Current strategies to improve soakage include:

- **Gypsum applications (changes the salt content in the soil, displacing sodium)**
- **Cultivating the sides of the beds (to break up the sides of the hill to encourage water movement)**
- **Slowing the water flow rate down (water is on the paddock longer, more chance of soaking across)**

The grower wants to trial new ways of managing soakage issues on his farm. One of the treatments he's trialling is called Aqua-sil. This is a polymer compound developed by CHT. CHT claim that Aqua-sil will improve soakage by creating a hydrophilic environment that will encourage the water to soak across. They also state that it will improve the water holding capacity of the soil, which may lead to less irrigations being required.

([https://www.cht.com/cht/web.nsf/id/pa\\_soil-conditioner-en.html](https://www.cht.com/cht/web.nsf/id/pa_soil-conditioner-en.html))

Thiocal is a liquid fertiliser that calcium and sulphur (the same elements contained in gypsum) that is applied to the surface of the soil. It is supposed to work like gypsum; however, because it is in a liquid form, it may be more soluble, resulting in a faster reaction. (<http://www.campbellsfert.com.au/product/product-type/liquid-fertilisers/thiocal/>)

These treatments are being compared to gypsum (@ 5t/ha) as a standard practice and a control (no treatment).

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

Improving soakage will have a number of benefits. This may help reduce excess water being applied (especially if the grower is using a slower flow rate), which in turn increases the risk of water leaving the paddock (taking nutrients and pesticides). It may reduce the need for cultivation in the ratoons. Additionally, by irrigating the crop more effectively, this gives the plant a better chance to take up the applied nutrients, reducing the amount available to run off.

Furthermore, a more effectively irrigated crop is expected to yield higher, leading to productivity gains.

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

The soakage treatments will perform better than the untreated control.

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**Where did this idea come from: The grower (Mark Castalanelli)**

<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>June – Dec 2018</b>	<ul style="list-style-type: none"> <li>- Design and implement a trial comparing gypsum, thoidal and Aquasil to a control</li> </ul>
<b>Stage 2</b>	<b>Dec 2018 – Dec 2019</b>	<ul style="list-style-type: none"> <li>- Harvest trial (2R)</li> <li>- Analyse Data</li> <li>- Fertilise trial with a standard fertiliser across all plots (all treatments were applied upfront so the trial only needs to be fertilised)</li> </ul>
<b>Stage 3</b>	<b>Dec 2019 – Dec 2020</b>	<ul style="list-style-type: none"> <li>- Harvest trial (3R)</li> <li>- Analyse Data</li> <li>- Fertilise trial with a standard fertiliser across all plots (all treatments were applied upfront so the trial only needs to be fertilised)</li> </ul>
<b>Stage 4</b>	<b>Dec 2020 – Dec 2021</b>	<ul style="list-style-type: none"> <li>- Harvest trial (4R)</li> <li>- Analyse Data</li> <li>- Fertilise trial with a standard fertiliser across all plots (all treatments were applied upfront so the trial only needs to be fertilised)</li> </ul>
<b>Stage 5</b>		
<b>Stage 6</b>		

## Project Trial site details

<b>Trial Crop:</b>	Sugarcane
<b>Variety: Rat/Plt:</b>	2R Q209
<b>Trial Block No/Name:</b>	BKN-07931A-02-01
<b>Trial Block Size Ha:</b>	
<b>Trial Block Position (GPS):</b>	
<b>Soil Type:</b>	Clay loam

## Block History, Trial Design:

### Paddock History:

- Soakage issue
- As a 1<sup>st</sup> ratoon, the paddock yielded 120tC/ha, 16.01 CCS
- One side of the paddock (not in the trial) was treated with lime and gypsum after the crop was cut as plant. This section yielded 15tC/ha higher than the untreated area, with no difference in CCS
- In 2018, the paddock was cut between 02/08 and 16/09.
- After the trial was implemented, the grower implemented 2 extra treatment plots outside of the trial. There are 6 rows of a different gypsum (4t/ha) and 6 rows of mill ash (80t/ha). There are two rows separating these plots and 6 rows guard between the trial and the extra plots.

### Trial Implementation:

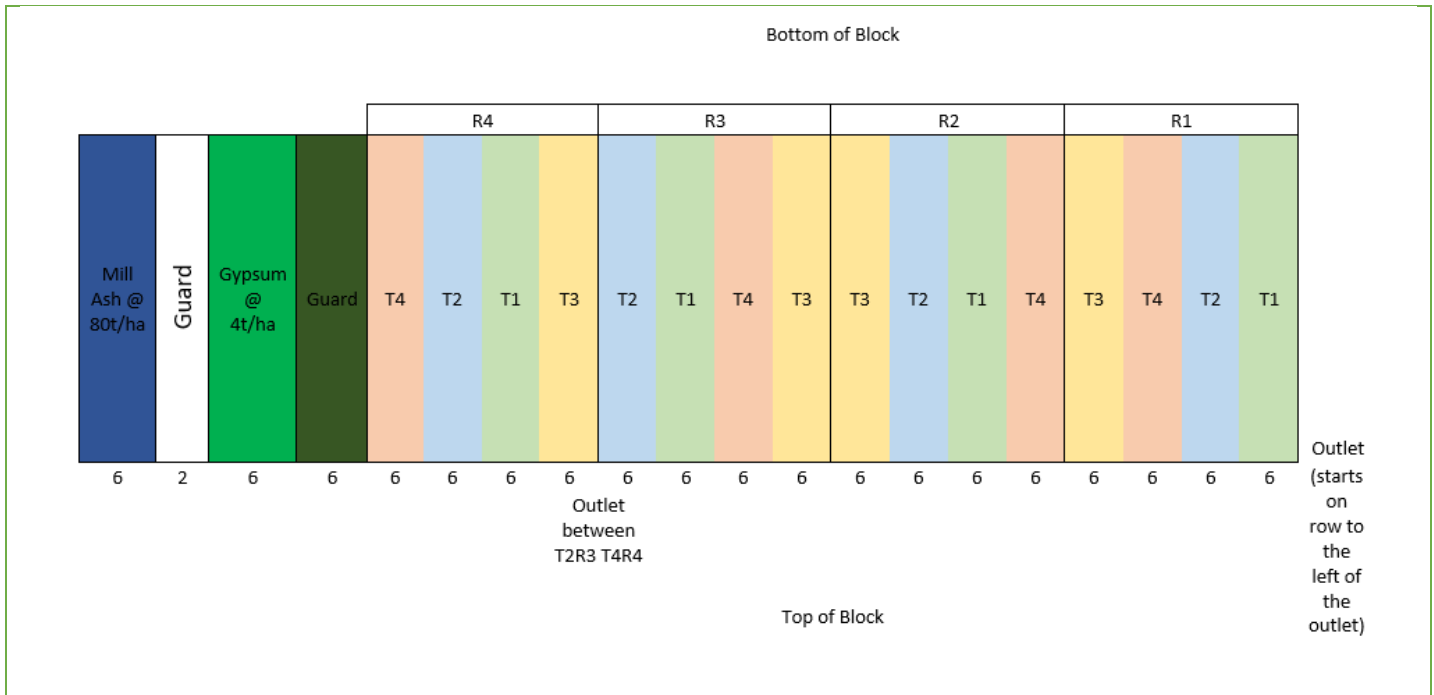
- The gypsum treatment was applied (broadcast) using an auger truck
- The paddock was fertilised with a liquid fertiliser blend (LIQUID EZY 3: 15.9/0/8.3/2.1) @ 1200L/ha. This applied 190N 0P 100K 25S.
- The Aqua-Sil treatment was applied through the Liquaforce Liquid Fertiliser Applicator @ 35L/ha
- The Thiocal treatment was applied using Irvin legs

Fertiliser Blend (Applied to whole trial)						
Product	Rate	N rate (kg/ha)	P (kg/ha)	K (kg/ha)	S (kg/ha)	Date Applied
Liquid EZY 3	1200	190	0	99	25	3/10/2018

### Treatments:

#### Trial Treatments:

Treatment	Product	Applicator	Date Applied
T1	Control (No product)	None	-
T2	Aqua-sil @ 35L/ha	Liquaforce Liquid Fert Applicator	3/10/2018
T3	Gypsum @ 4t/ha	Gypsum Truck	13/09/2018
T4	Thiocal @ 150L/ha	Spray Rig (Irving Legs)	4/10/2018



## Results:

## Conclusions and comments

**Advantages of this Practice Change:**

**Disadvantages of this Practice Change:**

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

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