

# Innovation Project Final Report

## Banded Mill Mud on Pre-Plant Crop

**Innovation Project Name : Catalyst**

**Project ID: RR-C-1415-252**

**Landholder ID: DATA FIELD**

**Project Completion Date: DATA FIELD**

### Background Information

**Grower Name:** David Morselli

**Entity Name:** Morselli R Family Trust

**Trial Farm No/Name:** HBT-00238A

**Total Farm Area:** 193ha

**Mill Area:** Victoria

**No. Years Farming:** 35

**Trial Subdistrict:** Lannercost

**Crop Type:** Sugar cane

**Area ha:** 193

**Crop Type:**

**Area ha:**

**Crop Type:**

**Area ha:**

**Crop Type:**

**Area ha:**

**Crop Type:**

Area ha:

**Aim: (What are you specifically testing)**

This project aims to investigate the use of varying rates of mill mud banded into the planting line before plant.

Whether transporting the mill mud is economically viable to a region outside of the traditional transportation area.

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

Mill mud has traditionally been used as an ameliorant to improve soil water holding capacity and as a source of nutritional value. By banding the mill mud into the planting line, the benefits are localised to the growing region of the soil and not lost to run off due to heavy rainfall events. Furthermore, banding the mill mud means that less is required to be transported. This may reduce costs associated with transporting mill mud to areas outside the usual region of transportation by the mill trucks.

**Why are you trying this: eg. Profitability**

Farms that are outside the traditional transportation area of the mill trucks find it unaffordable to utilise mill by products such as mill mud. By investigating more efficient uses of mill mud, these costs may be reduced, and productivity increased.

Mill Mud is also a good organic source of nutritional value. Being able to transport the mud out to these areas that traditionally don't receive these ameliorants can help improve productivity and soil health to regions that would gain many benefits from such a product.

**Potential Water Quality Benefit:**

Banding mill mud into the planting line reduces the risk of loss to run off to the Great Barrier Reef. This is particularly important in regards to phosphorous.

**Expected Outcome of Trial:**

That the varying rates of mill mud will have a positive impact on productivity. Though the rates in this trial are much lower than the commercially applied rates, banding will localise the benefits to the growing zone and reduce total volume of product required, predicted to reduce overall costs.

**Support Provided By:**

Megan Zahmel HCPSL

**Terrain NRM** Michael Waring

**Where did this idea come from: eg. Forum, Adviser**

The idea was brought forward by the grower and further developed by Farmacist, Terrain NRM and HCPSL.

<b>Plan - Project Activities</b>	<b>Date :</b> (mth/year to be undertaken)	<b>Activities :</b> (breakdown of each activity for each stage)	<b>Actions :</b> (as per contract actions)
<b>Stage 1</b>	18-Dec-2015	<ul style="list-style-type: none"> <li>• Design and establish trial <b>Completed</b></li> <li>• Farm Management Plans complete (CP, WMP, NMP), as per quote Attachment 2 <b>Completed</b></li> <li>• Progress report to include results and provided to Terrain NRM <b>Completed MW</b></li> </ul>	
<b>Stage 2</b>	30-Nov-2016	<ul style="list-style-type: none"> <li>• Harvest of 2016 season completed</li> <li>• Collation and statistical analysis of data completed</li> <li>• Progress report to include results and provided to Terrain NRM</li> </ul>	
<b>Stage 3</b> <i>Trial handed over to HCPSL Nov 2016</i>	01-Nov-2017	<ul style="list-style-type: none"> <li>• Harvest of 2017 season completed – 12/10/2017</li> <li>• Collation of data completed – 14/12/2017</li> </ul>	
<b>Stage 4</b>	01- Jan 2018	<ul style="list-style-type: none"> <li>• Poor germination due to 150ml of rain after this trial was planted has results in a poor-quality trial, that is showing unfair results.</li> </ul>	

**Project Trial**

Mill Mud used at pre-plant fallow

**Crop:** Sugarcane**Rat/Plt:** PLT 2016**Variety:** Q240**Crop Height/Stage:** Bare Fallow**Block History:(If Relevant)**

Grass Fallow after sugarcane

**Trial Block No/Name:**

B# 15-5

**Trial Block Size Ha:** 3.888**Trial Block Position (GPS):**

18° 13' 54.72" , 146° 03' 00.60"

**Soil Type:** Clay**No. Replicates:** 2**Control/Standard Practice:** No mill mud applied.**Application Method:** -

Rate: -

Date Applied: 8/8/2015

**Changed Practice: 1**

T2 Mill mud banded over row area with GPS &amp; rotary hoed into preformed bed

<b>Application Method:</b>	Rate: 30t/ha	Date Applied: 8/8/2015
<b>Changed Practice: 2</b>	T3 Mill mud banded over row area with GPS & rotary hoed into preformed bed	
<b>Application Method:</b>	Rate: 60t/ha	Date Applied:8/8/2015
<b>Changed Practice: 3</b>	T4 Mill mud banded over row area with GPS & rotary hoed into preformed bed	
<b>Application Method:</b>	Rate: 90t/ha	Date Applied: 8/8/2015
<b>Changed Practice: 4</b>		
<b>Application Method:</b>	Rate:	Date Applied:
<b>Conclusions</b>		

**Conclusions based on results:**

There was no significant difference between the treatment yields (tC/ha, CCS and tS/ha); however, due to the waterlogging that occurred very soon after planting the trial, it is not a fair representation of what the treatments may yield (Due to a 150mm rainfall event 3 days after planting). There was an upward trend in the treatment yields, as the rate of mill mud was increased; all the mill mud treatments yielded higher than the control treatment.

The trial should be re-harvested in 2016, or reimplemented on a new block for a fairer representation of the treatments.

The trial was followed through for another season into 2017. There was no statistical difference between treatments and due to the trial having a poor germination rate after plant, the decision was made to re-implement a new trial to gain a fairer representation of what the trial could achieve.

**Advantages of this Practice Change:**

Banding mill mud reduces the rate that it is applied, reducing the amount of nitrogen and phosphorous applied to the paddock, thus reducing the amount of these nutrients that may leave the farm in run off. This is especially important considering the proximity of the Herbert river catchment to the Great Barrier Reef.

There is potential for increases to sugarcane yields by banding mill mud on the stool; however, this hasn't been shown to be significant in this trial. There was an upward trend in cane and sugar yields (t/ha), where the mill mud was applied, compared to the control.

Traditionally, only growers that are close to the mill can afford mill mud applications due to the high rate that it is applied and the wet weight of the product. By banding mill mud on the stool, rates can be reduced. This may increase the number of growers that will be able to afford mill mud applications.

**Disadvantages of this Practice Change:**

If there is a heavy wet season, then getting onto the paddock to band the mill mud might cause damage to pre-formed mounds

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

I would recommend it.

The results of this trial are not a fair representation of what banded mill mud may yield under normal growing circumstances.

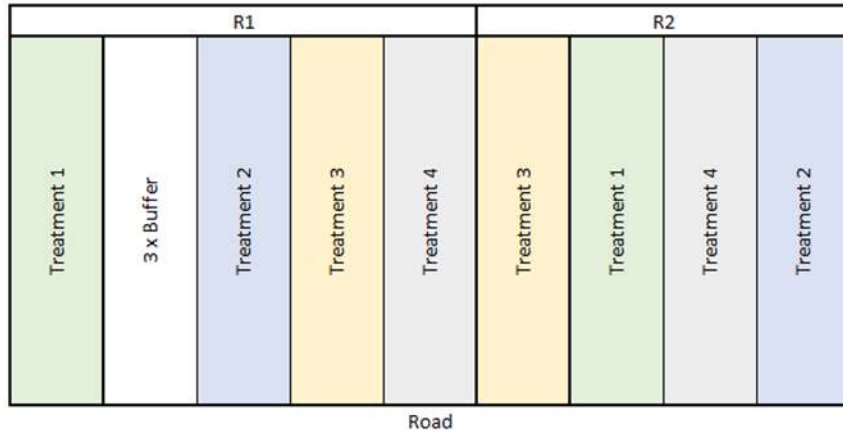
**% of farm you would be confident to use this practice :**

All Fallow/plant blocks

**Trial Map Attached**

**Y**

Moreseili's Trial Layout - 2015



Trial Number	1	HBT-00242A
Treatments	4	15
Replicates	2	
Drills per treatment	6	
Row spacing	1.8 m	
Row length	450 m	
Area per plot	0.486 ha	
Area per treatment	0.972 ha	
Area per trial	3.888 ha	

Treatment	Product	Rate (t/ha)
Treatment 1	Control	
Treatment 2	Mill Ash	30
Treatment 3	Mill Ash	60
Treatment 4	Mill Ash	90

**Attach Trial Results Attached Y/N**



## 2016 Harvest data

### Tonnes Cane per Ha

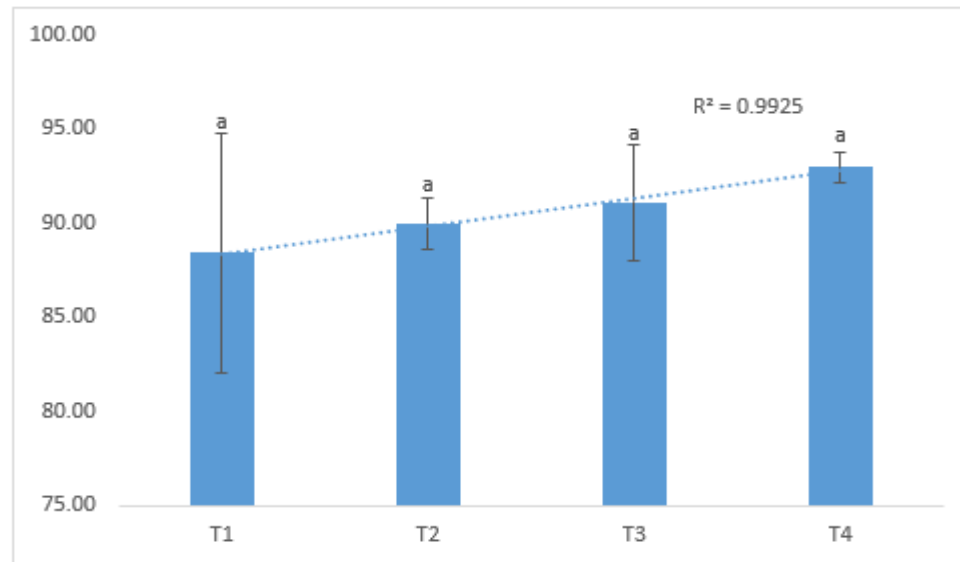


Figure 6 Tonnes of cane per hectare yields (tC/ha)

Table 3 Tonnes of cane per hectare values

Treatment	Cane yield (tC/ha)	Significance
T1	88.41	a
T2	89.94	a
T3	91.11	a
T4	92.97	a

## Tonnes Sugar per Ha

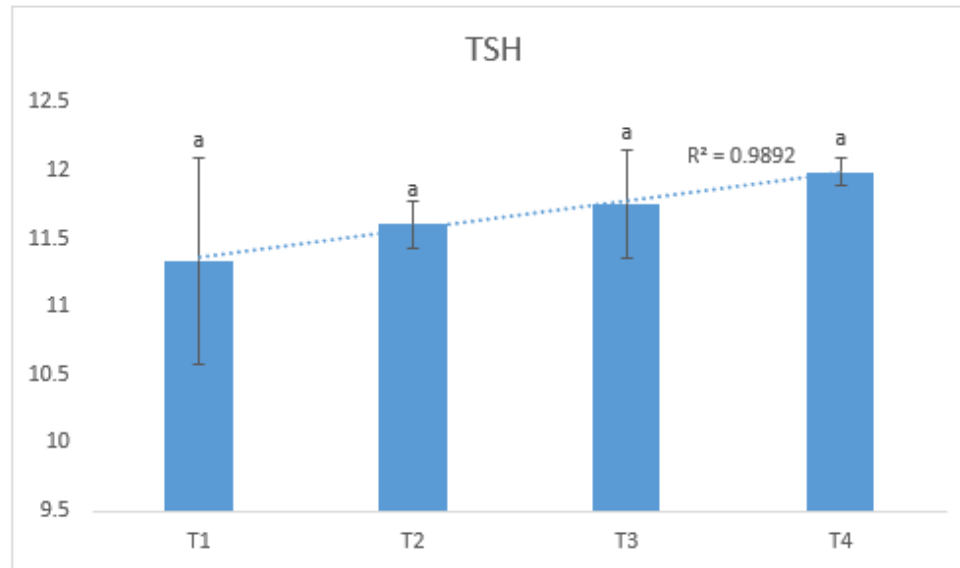


Figure 8 Tonnes of Sugar per hectare yields (tS/ha)

Table 5 Tonnes of sugar per hectare yield values

Treatment	Sugar yield (tS/ha)	
T1	11.34	a
T2	11.61	a
T3	11.76	a
T4	11.99	a

## CCS results 2016

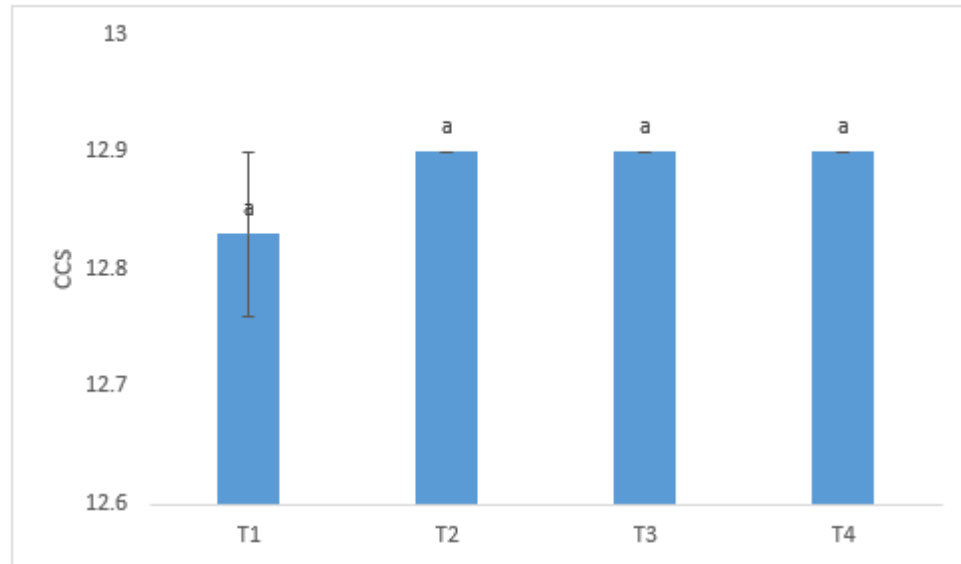


Figure 7 Treatment CCS values

Table 4 CCS values

Treatment	CCS	
T1	12.83	a
T2	12.9	a
T3	12.9	a
T4	12.9	a

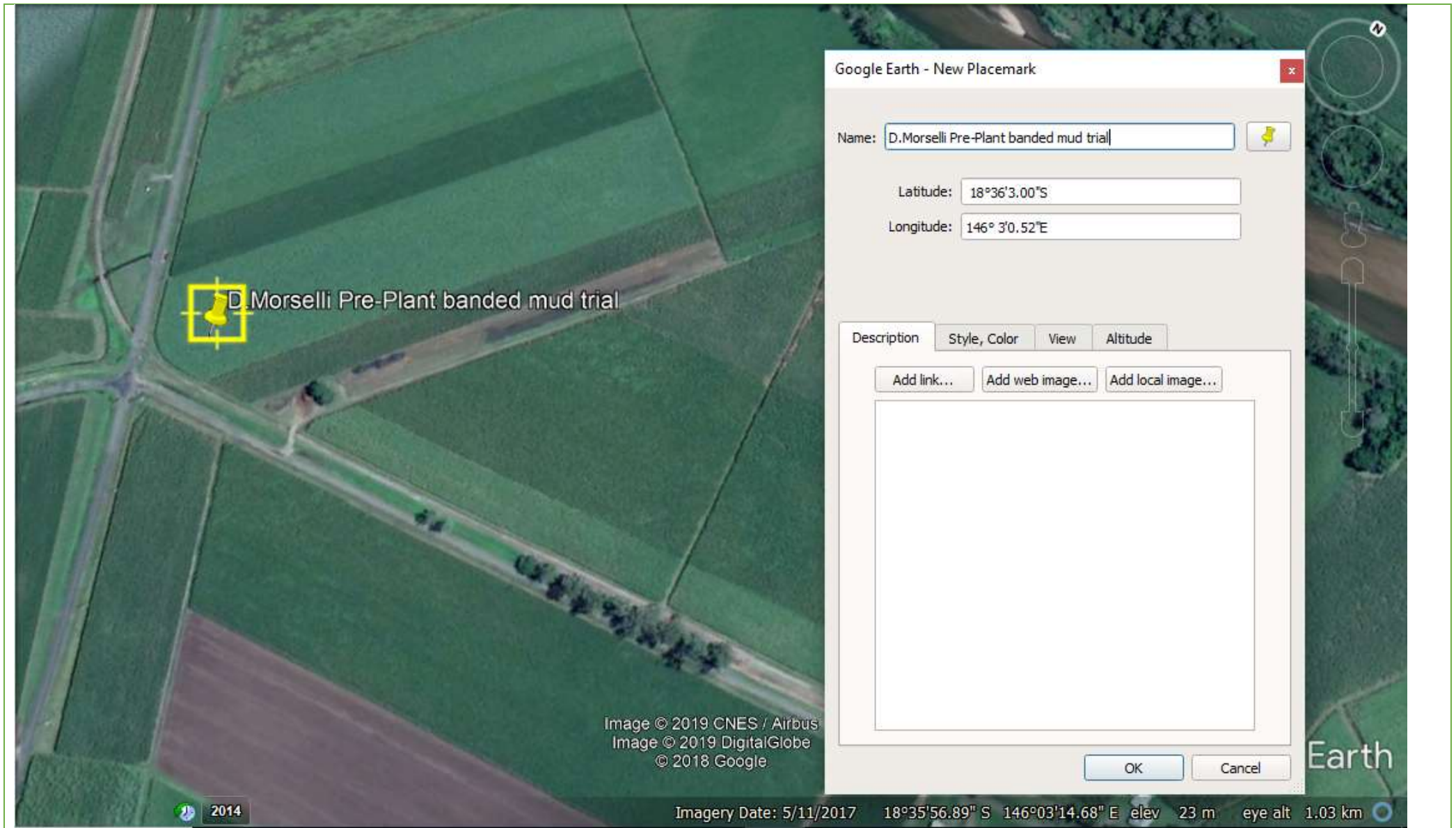
2017 Harvest data

Summary of results for 2017 Harvest of Pre-plant mill mud trial

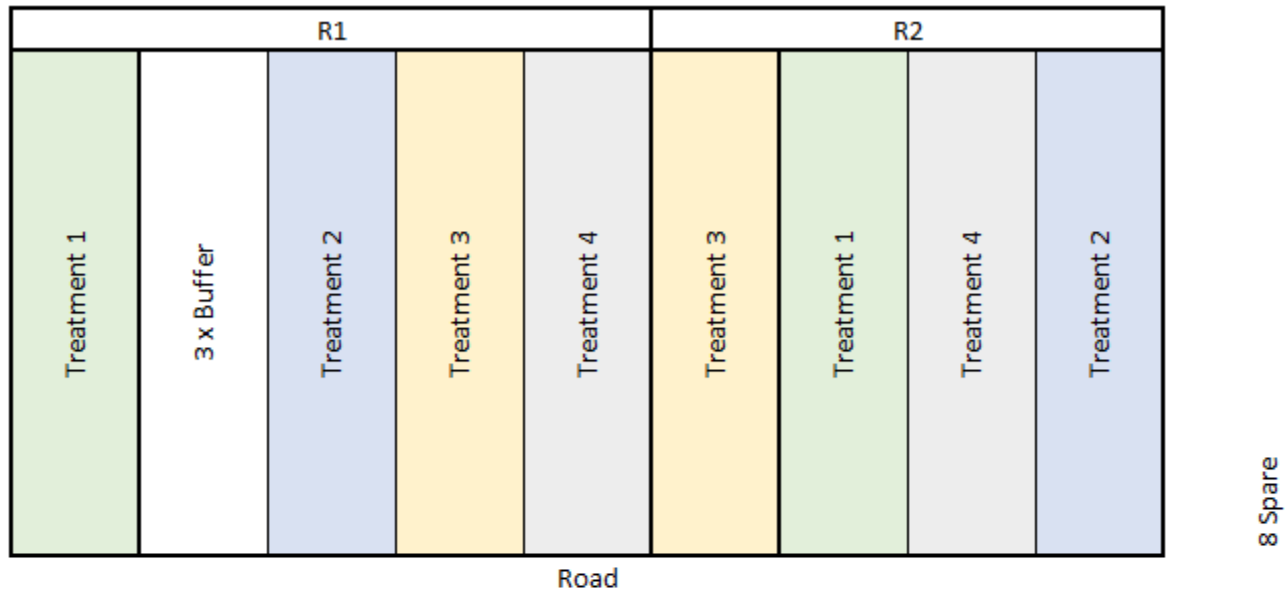
Summary 2017 1 <sup>st</sup> Ratoon				
	Trt 1 - Control	Trt 2 - 30t/ha	Trt 3 - 60t/ha	Trt 4 - 90t/ha
Average CCS	14.53	14.4	14.55	14.65
Average T/C/Ha	77.26	73.90	78.74	77.84
Average T/S/Ha	11.22	10.47	11.46	11.40



<b>Photos of Trial Attached</b>	<b>Y/N</b>
<b>Farm Map attached Indicating Trial Position (from grants officer)</b>	<b>Y/N</b>



Moreselli's Trial Layout - 2015



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