

# Project Catalyst Trial Report

## Variable Rate Phosphorus Trial

### Grower Information

Grower Name:	Stephen & Brendan Accornero
Entity Name:	Accornero Family Trust T/A
Trial Farm No/Name:	F# 416A B# 7-6
Mill Area:	Victoria, Herbert region
Total Farm Area ha:	491
No. Years Farming: (Grower Experience)	
Trial Subdistrict:	Bambaroo
Area under Cane ha:	

### Trial Status

Completed /  Continuing

## **Background Information**

### **Aim:**

Strategic application of phosphorus where it is required as opposed to broad rate application of phosphorus.

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

Soil testing on the block showed a wide range in phosphorus measurement. With some points wanting 60kg/ha of P while other points only required 20kg/ha  
By using variable rate technology, the grower can target phosphorous application to where it's most needed. This will have other benefits like, a more even yield across the block, reduced weed pressure from better germination of cane and possibly better NUE from the plant.

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

benefits will be through reduced P losses through targeted application.  
There is a potential reduction in N losses as improved crop growth across the paddock allows improved N utilisation.

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

By applying P at a VR, the grower can target and improve yield across his block.  
Economic benefits could be achieved through improved profitability by reduced costs of applied phosphorous or through improved yield for same total phosphorous applied.

**Service provider contact:** Megan Zahmel: 0447 317 102

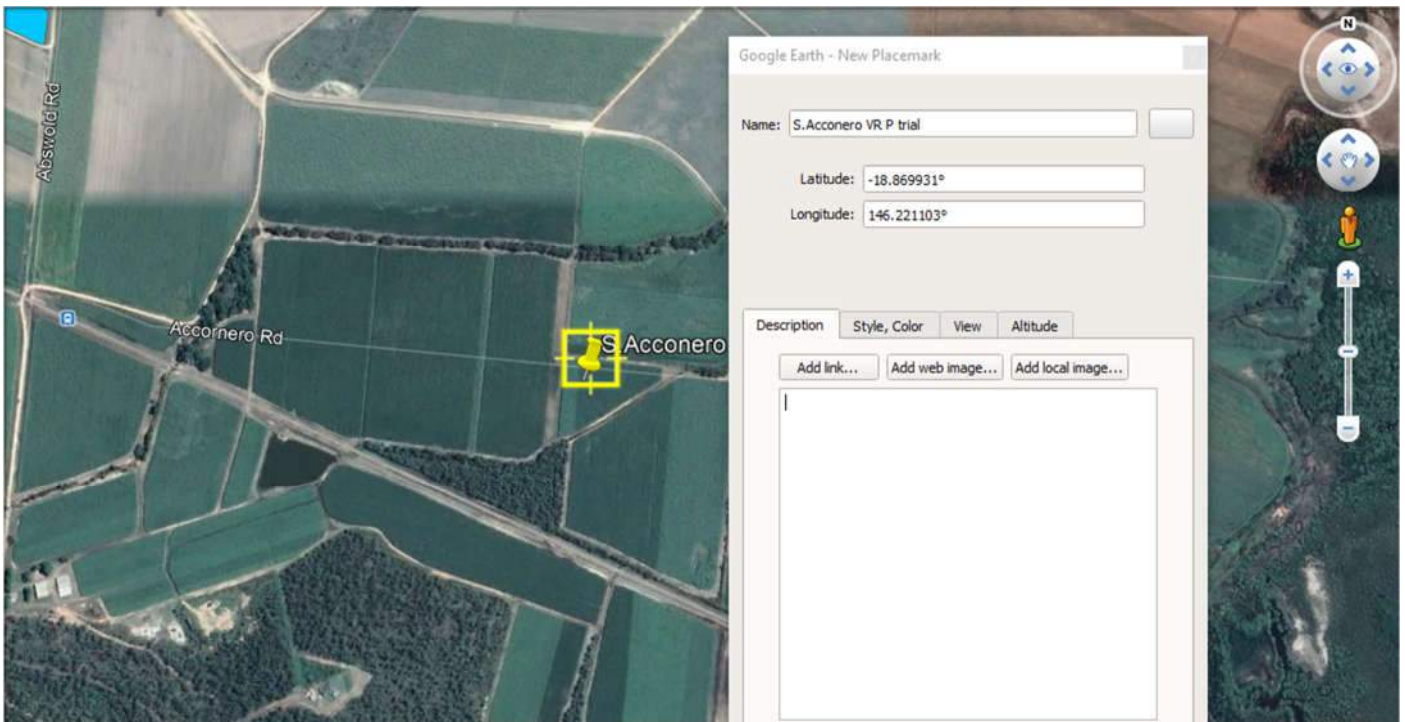
### **Where did this idea come from:** Stephen and Brendan Accornero

Grower's frustration with lack of response to lime and other treatments for the poor strike in section of his paddocks. Further investigations found a huge variation in available phosphorous, so grower would like to trial the use of his crop management approach.

<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>	Establish trial	<ul style="list-style-type: none"> <li>- 1/11/2019 – Soil tests taken at all soil points</li> <li>- 17/11/2019 – Soil tests are interpreted, and variable rate map is created</li> <li>- 21/11/2019 – Trial design is created</li> <li>- 24/11/2019 – Trial is marked out</li> <li>- 24/11/2019 – Fertiliser is applied with VR box according to trial design</li> <li>- 19/12/2019 – KPI water samplers installed at the trial</li> </ul>
<b>Stage 2</b>	Sampling 2020	<ul style="list-style-type: none"> <li>- 29/01/2020 – Water samples collected. 200ml Rain recorded. Trial site flooded. Some KPI samplers failed to collect sample.</li> <li>- 24/02/2020 – Water samples collected. 157ml rain recorded. Trial site flooded at one end of block. Some KPI samplers failed to collect sample.</li> <li>- 1/03/2020 - 1st set of water sample were send to TropWaters lab for analysis. Only three samples were captured due to faulty water samplers in the field. 2<sup>nd</sup> set of water samples were not sent for analysis due to flooding compromising the trial data.</li> <li>- 3/08/2020 - Trial was harvested for mill data.</li> </ul>
<b>Stage 3</b>		
<b>Stage 4</b>		
<b>Stage 5</b>		
<b>Stage 6</b>		
<b>Stage 7</b>		

## Project Trial site details

<b>Trial Crop:</b>	Sugarcane
<b>Variety:</b>	Q250
<b>Rat/Plt:</b>	Planted 2019
<b>Trial Block No/Name:</b>	B# 7-6 VR P
<b>Trial Block Size Ha:</b>	5.78 ha
<b>Trial Block Position (GPS):</b>	Refer to google earth map
<b>Soil Type:</b>	Clay



## Block History, Trial Design:

### History:

Block has consistent uneven germination of cane. Lack of response to lime and other treatments for the poor strike in section of his paddocks.

### Trial Design:



### Treatments:

Trt 1: Standard 20kg/ha P rate

Trt 2: VR P rates according to soil testing



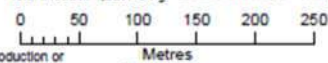
Results:

Variable Rate Map



**ACCORNERO  
BLOCK 0416A-7-6**

Total Area: 6.26Ha  
Total Product: 1,226.45 Kg Scale All Maps - 1:4,000



1mPcon = ~0.6m  
2mPcon = ~1.2m  
1mHcon = ~1.5m  
4mPcon = ~2.4m  
2mHcon = ~3m  
4mHcon = ~6m



**Variable Rate P**  
1mPcon  
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2mPcon Date: 19/11/2019

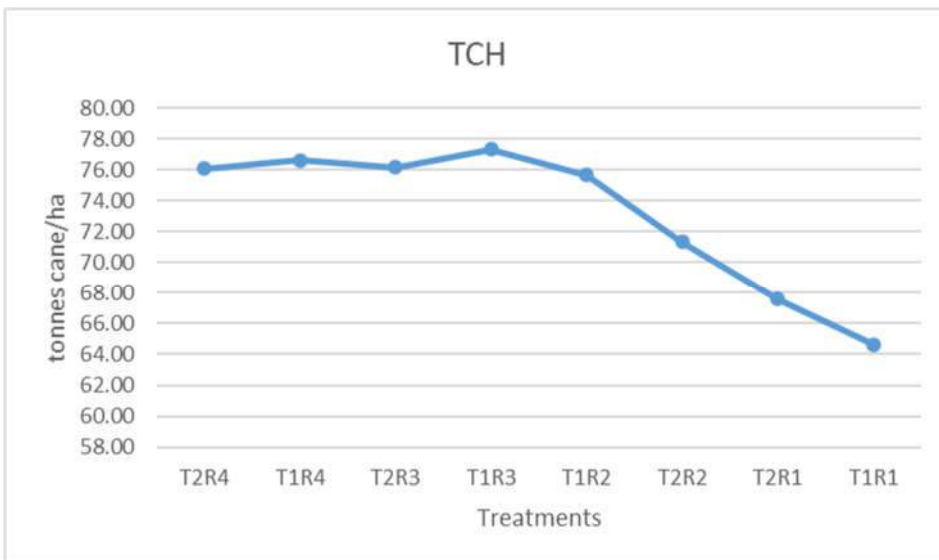
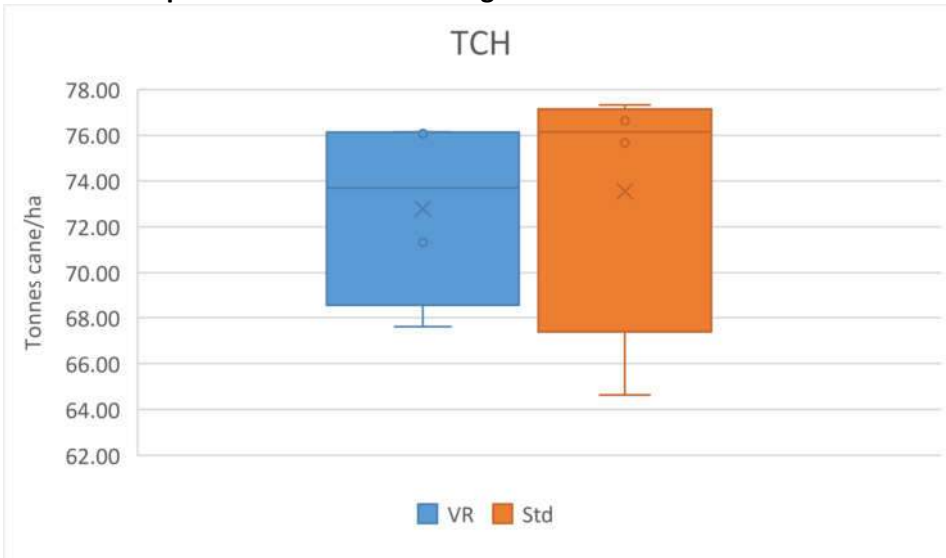
1mHcon



**Water Samples results collected in Jan 2020**

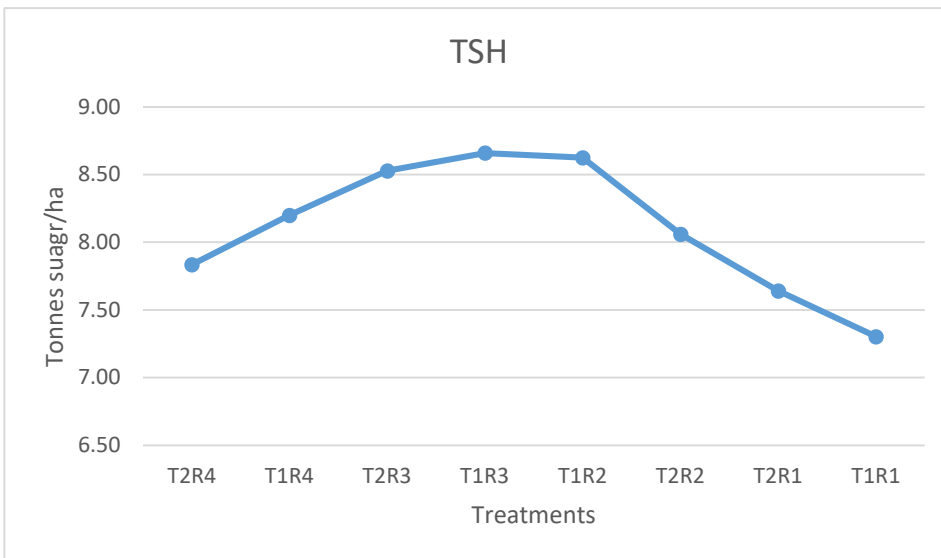
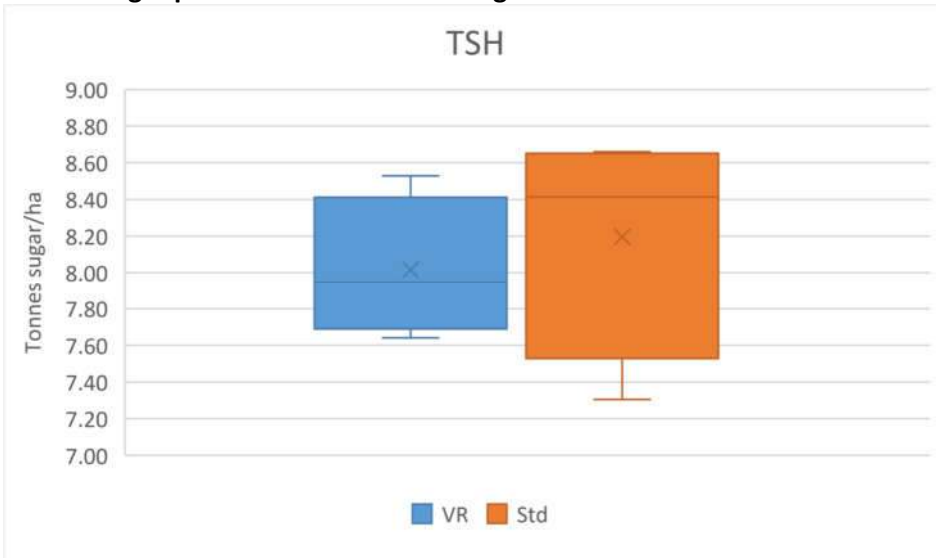
Sample #	Treatment	Result for Total P	Results for Total dissolved P	Filterable Reactive P
A1	Standard 20kg/ha P	83	42	15
A2	Variable Rate P	86	15	3
A3	Variable Rate P	160	48	22

### Tonnes Cane per Hectare Harvested Aug 2020





**Tonnes Sugar per hectare. Harvested Aug 2020.**



### Economics Table

\$400 per t of sugar														
	TCH		TSH		Gross income		Harvesting cost		P Fertiliser cost		Minus variable costs		Difference	Difference percent
	VR	Standard	VR	Standard	VR	Standard	VR	Standard	VR	Standard	VR	Standard		
R4	76.08	76.63	7.84	8.20	\$3,134	\$3,280	\$654.3	\$659.0	\$219.7	\$261.3	\$2,260.37	\$2,359.51	-\$99.14	-4.39%
R3	76.15	77.32	8.53	8.66	\$3,412	\$3,464	\$654.9	\$664.9	\$219.7	\$261.3	\$2,537.00	\$2,537.59	-\$0.59	-0.02%
R2	71.33	75.66	8.06	8.63	\$3,224	\$3,450	\$613.4	\$650.7	\$219.7	\$261.3	\$2,390.92	\$2,538.18	-\$147.27	-6.16%
R1	67.62	64.64	7.64	7.30	\$3,056	\$2,922	\$581.5	\$555.9	\$219.7	\$261.3	\$2,255.15	\$2,104.42	\$150.73	6.68%
	72.79	73.56	8.02	8.20	\$3,207	\$3,279	\$626.0	\$632.6	\$219.7	\$261.3	\$2,360.86	\$2,384.92	-\$24.07	-1.02%
* Assuming NKS fert has remained constant, spraying, cultivation, man hours and levees have remained constant. Harvesting cost is @ \$8.60. P cost is @ \$4.7/kg														
Average kg of P/ha in VR treatment is 17.25kg/ha														

## Conclusions and comments

Unfortunately, the trial had several issues to deal with.

- Extreme dry weather when the trial was planted effected cane growth and cause variation within the block.
- Then flooding in early 2020 effected the cane growth again.

These events have resulted in bias variations within the block affecting cane vigour and yields. The trial should be run again to fully understand the potential benefits of targeted phosphorus.

The KPI water samplers failed due to faults with the type of samplers used. Several technical issues were encounter such as:

- One sampler has completely burnt out and cannot be fixed.
- Two of the floats will not prime, so even though the float rises the sampler is not collecting the water runoff.
- Float switches are very temperamental in that on occasions they will work then other times they will get stuck and not actuate.

Due to these issues the water quality data could not be captured arcuately and therefore no comprehensive results were capture to analysis water quality data

### Advantages of this Practice Change:

By applying P where it is most needed should improve plant germination rates and overall yield.

Also, there could be economic advantages because the grower may reduce the amount of overall P needed or the benefits will return with a better consistent yield across the block.

### Disadvantages of this Practice Change:

Growers would have to take multiple soil samples across there blocks to get variable P rates which can get expensive.

Growers would need to up to date with Precision agriculture and the technology

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

At this stage no. The trial needs more study and more reliable data to confidently suggest that it would be beneficial.

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

More trial work is needed. Unfortunately, the grower is too busy at this stage to rerun the trial.