

Catalyst Project Final Report

Grower Information

Grower Name:	Mario Raccanello
Entity Name:	Raccanello Family Trust
Trial Farm No/Name:	F8571
Mill Area:	Tully
Total Farm Area ha:	420
No. Years Farming:	30
Trial Subdistrict:	Riversdale
Area under Cane ha:	350

Background Information

Aim: Reduce N Rates by 25 to 50 percent by the addition of potassium humate.

Background: (Rationale for why this might work)

Potassium humate is one of a number of humic compounds that international literature indicates as having high potential to improve many soil/plant properties and interactions eg: formation of organo-clay complexes and resulting in stable soil aggregates; improvement of water holding capacity; soil temperature regulation; electrochemical and ion exchange properties; formation of colloids; adsorption of organic chemicals including pesticides; control of plant pathogens, and hormone-like activity in plant growth.

One of the potential net results is increased nutrient use efficiency, particularly nitrogen use efficiency, in cropping systems. This potential has been confirmed in some crops, under some management, climate and geographic situations.

Potential Water Quality Benefit:

A 25% reduction in applied N would, if broadly adopted, have significant water quality benefit due to less surplus N available for loss.

Expected Outcome of Trial:

That some of the trial replicates will show no significant difference in yield between the control 100% N 6ES rates and the 50% and 25% reduced N rates used in addition with potassium humate. Additionally, to observe the differences between the higher and lower rates of potassium humate.

Service provider contact:

Charissa Rixon of T.R.A.P. Services & Kym Kruse of RegenAg

Where did this idea come from:

The grower's own research and informal experimentation.

Plan - Project Activities	Date : (mth/year to be undertaken)	Activities :(breakdown of each activity for each stage)
Stage 1	Nov-Dec 2016	Harvest of Trial – 1 st Harvest Fertilizer Applied Soil samples collected to conduct chromas Data collection and analysis
Stage 2	Jan- Mar 2017	Biofertilizer Application
Stage 3	Nov-Dec 2017	Harvest of Trial – 2 nd Harvest Fertilizer Applied Soil samples collected to conduct chromas Data collection and analysis
Stage 4	Jan- Mar 2018	Fertilizer Application
Stage 5	Nov-Dec 2018	Harvest of Trial – 3 rd Harvest Fertilizer Applied Soil samples collected to conduct chromas Data collection and analysis
Stage 6	Jan- Mar 2019	Fertilizer Application
Stage 7	Nov-Dec 2019	Harvest of Trial – 4 th Harvest Fertilizer Applied Soil samples collected to conduct chromas Soil sample of each plot for traditional soil analysis Data collection and analysis

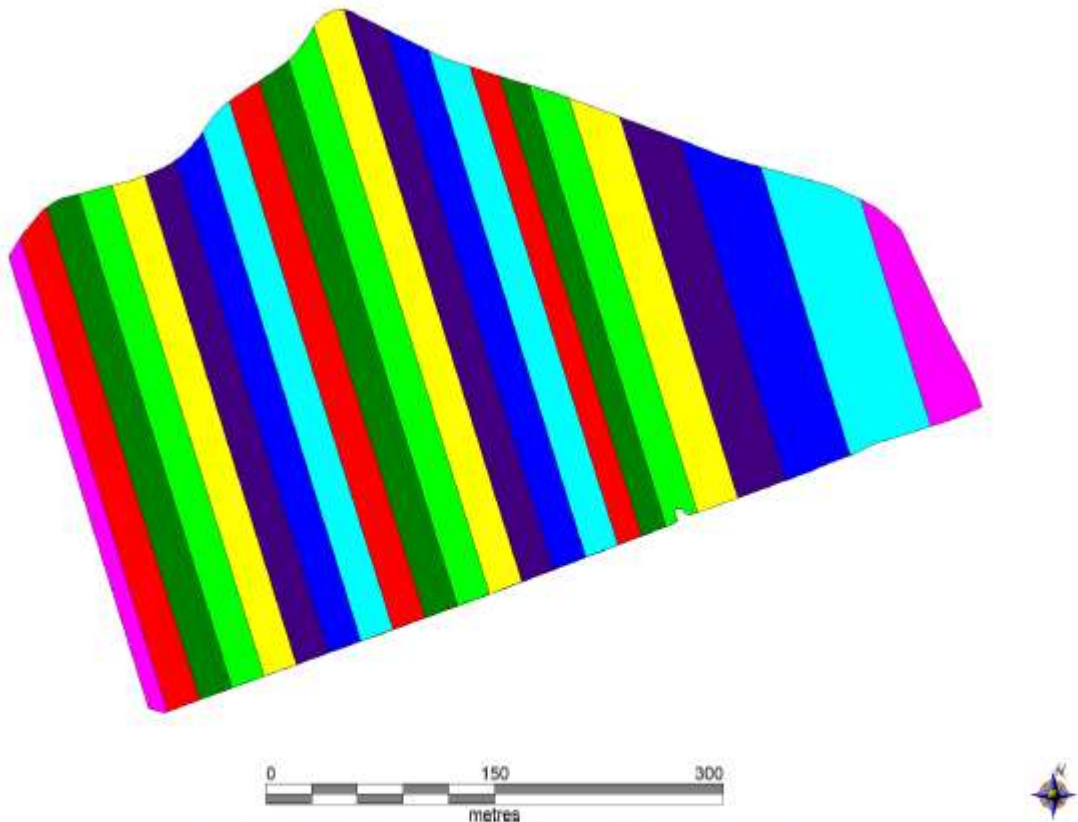
Project Trial site details

Trial Crop:	Sugarcane
Variety:	Q200
Rat/Plt:	2 nd Ratoon Onwards
Trial Block No/Name:	86
Trial Block Size Ha:	17
Trial Block Position (GPS):	S 17.9610 E 145.8162
Soil Type:	Tully Series

Block History, Trial Design:

This block was planted with bananas for 5 years, and was ploughed out in 2012 and planted to cane.

Trial Design: 3 replicate randomised complete block (RCB) design.



	50% N 6ES	2.52 ha		75% N 6ES + 20 L/ha K-Humate	2.47 ha
	50% N 6ES + 10 L/ha K-Humate	2.62 ha		100% N 6ES	2.17 ha
	50% N 6ES + 20 L/ha K-Humate	2.63 ha		Buffer	0.77 ha
	75% N 6ES	2.18 ha			
	75% N 6ES + 10 L/ha K-Humate	2.34 ha			

Treatments:

1. 100% 6ES
2. 75% 6ES
3. 75% 6ES + 10 L/Ha K-Humate
4. 75% 6ES + 20 L/Ha K-Humate
5. 50% 6ES
6. 50% 6ES + 10 L/Ha K-Humate
7. 50% 6ES + 20 L/Ha K-Humate

Results:

2016 Harvest

Treatment		tc/ha		CCS		ts/ha	
1	100% BAU	111.99	-	10.203	-	11.34	-
2	75% BAU	109.13	-	10.167	-	11.00	-
3	75% BAU + 10 L/Ha K-Humate	109.84	-	9.697	-	10.65	-
4	75% BAU + 20 L/Ha K-Humate	113.43	-	9.770	-	11.08	-
5	50% BAU	112.77	-	10.163	-	11.46	-
6	50% BAU + 10 L/Ha K-Humate	115.26	-	9.627	-	11.10	-
7	50% BAU + 20 L/Ha K-Humate	116.21	-	9.260	-	10.75	-
p-value		0.6631		0.5187		0.0915	
LSD (p = 0.05)		N/A		N/A		N/A	

2017 Harvest

Treatment		tc/ha		CCS		ts/ha	
1	100% BAU	98.17	-	12.91	-	12.61	-
2	75% BAU	93.06	-	12.77	-	11.83	-
3	75% BAU + 10 L/Ha K-Humate	93.02	-	12.92	-	12.01	-
4	75% BAU + 20 L/Ha K-Humate	94.47	-	12.95	-	12.23	-
5	50% BAU	88.21	-	12.97	-	11.43	-
6	50% BAU + 10 L/Ha K-Humate	91.71	-	12.69	-	11.61	-
7	50% BAU + 20 L/Ha K-Humate	94.65	-	12.44	-	11.76	-
p-value		0.9127		0.9002		0.5759	
LSD (p = 0.05)		N/A		N/A		N/A	

2018 Harvest

Treatment		tc/ha		CCS		ts/ha	
1	100% BAU	87.50	-	15.88	-	13.84	-
2	75% BAU	86.94	-	15.97	-	13.85	-
3	75% BAU + 10 L/Ha K-Humate	86.06	-	15.97	-	13.72	-
4	75% BAU + 20 L/Ha K-Humate	88.27	-	16.04	-	14.15	-
5	50% BAU	79.96	-	16.13	-	12.90	-
6	50% BAU + 10 L/Ha K-Humate	82.59	-	15.88	-	13.11	-
7	50% BAU + 20 L/Ha K-Humate	85.37	-	15.65	-	13.36	-
p-value		0.8375		0.8024		0.7882	
LSD (p = 0.05)		N/A		N/A		N/A	

2016-2018 Harvest Summary

Treatment		tc/ha		CCS		ts/ha	
1	100% BAU	99.22	-	13.00	-	12.59	-
2	75% BAU	96.38	-	12.97	-	12.23	-
3	75% BAU + 10 L/Ha K-Humate	96.31	-	12.86	-	12.13	-
4	75% BAU + 20 L/Ha K-Humate	98.72	-	12.92	-	12.49	-
5	50% BAU	93.65	-	13.09	-	11.93	-
6	50% BAU + 10 L/Ha K-Humate	96.52	-	12.73	-	11.94	-
7	50% BAU + 20 L/Ha K-Humate	98.74	-	12.45	-	11.96	-
p-value		0.9826		0.9993		0.8970	
LSD (p = 0.05)		N/A		N/A		N/A	



Conclusions and comments

After 2 years, there is still no statistical difference between any of the treatments, irrespective of fertilizer rate or the potassium humate rate.

Advantages of this Practice Change:

No advantage has been seen to date.

Disadvantages of this Practice Change:

None – no major changes to infrastructure if stool splitter is fitted with a confidor applicator.

Will you be using this practice in the future:

Yes. The results from this trial will better inform the application methodologies.

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

100%. Potassium humate is currently used as a fertilizer (N) stabilizer, but the use associated with reduced N rates will be reliant on the trial results.

Appendix I – Trial Diary

Date	Notes
12-Nov-15	1st Ratoon Cane Harvested
19-Nov-15	Soil Samples taken for Chromatography
25-Nov-15	Fertilized with Stool splitter with double disc openers – Potassium Humate was applied through the Confidor injection system.
20-Nov-16	2 nd Ratoon Cane Harvested
24-Nov-16	Soil Samples taken for Chromatography
25-Nov-16	Fertilized with Stool splitter with double disc openers – Potassium Humate was applied through the Confidor injection system.
11-Nov-17	3 rd Ratoon Cane Harvested
15-Nov-17	Soil Samples taken for Chromatography
16-Nov-17	Fertilized with Stool splitter with double disc openers – Potassium Humate was applied through the Confidor injection system.
20-Oct-18	4 th Ratoon Cane Harvested
22-Oct-18	Soil Samples taken for Chromatography