Project Catalyst Final Report

Nitrogen Use Efficiency on Q253

Grower Information	
Grower Name:	Wayne Dal Santo
Entity Name:	DalSanto Farming Co
Trial Farm No/Name:	BKN-00327A
Mill Area:	Invictor
Total Farm Area ha:	367ha
No. Years Farming:	
Trial Subdistrict:	Clare
Area under Cane ha:	337.4

Trial Status

- Completed

Background Information

Aim:
This project aims to investigate different Nitrogen rates to determine the Nitrogen Use efficiency of some of the newer varieties in the Burdekin.

Background: (Rationale for why this might work)

There has been much anecdotal data to suggest that some of the newer varieties (Q240, Q253 and Q232) have the potential to be much more efficient users of Nitrogen. This has been found by growers who have suffered CCS losses when applying high rates of N. To verify this, we need to find what %N reduction can be achieved to maintain yield in varieties that have shown to be more efficient in N utilisation such as Q240, Q253 and Q232. As a result there is the potential to reduce amount of N applied, improve sugar production, reduce costs and improve water quality.

Potential Water Quality Benefit:
As the presence of Q240, Q253 and Q232 will be increasing in the future, if we can work out an optimised N rate that will give us both high tonnes and increased sugar accumulation there is the potential for significant reductions of N across the region. Henceforth, there will be a reduction in the amount of Nitrogen that is leaving our catchment and entering the Great Barrier Reef.

Expected Outcome of Trial:
It is expected that there will not be a reduction in yield tc/ha however there may be a CCS increase in the lower rates. Water quality leaving these locations will be improved.

Service provider contact: Farmacist

Where did this idea come from: Advisor

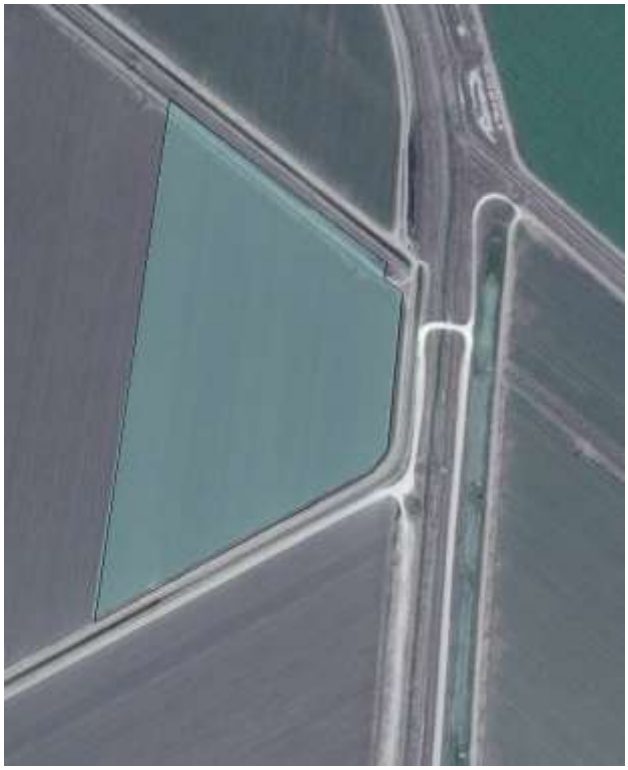
Plan - Project Activities	Date : (mth/year to be undertaken)	Activities :(breakdown of each activity for each stage)
Stage 1	**September 2016**	• Trial was implemented with 4 different rates (223N, 201N, 181N, 162N) along with a 50meter strip of 100N
Stage 2	**September 2017**	• Harvest trial site • Analysis of trial data
Stage 3	**October 2017**	• Reapplication of trial for year two data
Stage 4	**October 2018**	• Harvest trial site • Analysis of trial data

Project Trial site details

Trial Crop:	Sugarcane
Variety: **Rat/Plt:**	Q253 1st Ratoon
Trial Block No/Name:	BKN-00327A-5-8
Trial Block Size Ha:	10.38
Trial Block Position (GPS):	147.196619 -19.825188
Soil Type:	2Ugc Bottom Half of Block, 2Uge top half of block

Block History, Trial Design:

245kg/ha 100N	Rep 1	Rep 2	Rep 3
	Treatment 1 630 kg/ha	Treatment 2 560 kg/ha	Treatment 1 630 kg/ha
	Treatment 2 560 kg/ha	Treatment 3 500 kg/ha	Treatment 4 440 kg/ha
	Treatment 3 500 kg/ha	Treatment 1 630 kg/ha	Treatment 2 560 kg/ha
	Treatment 4 440 kg/ha	Treatment 4 440 kg/ha	Treatment 3 500 kg/ha

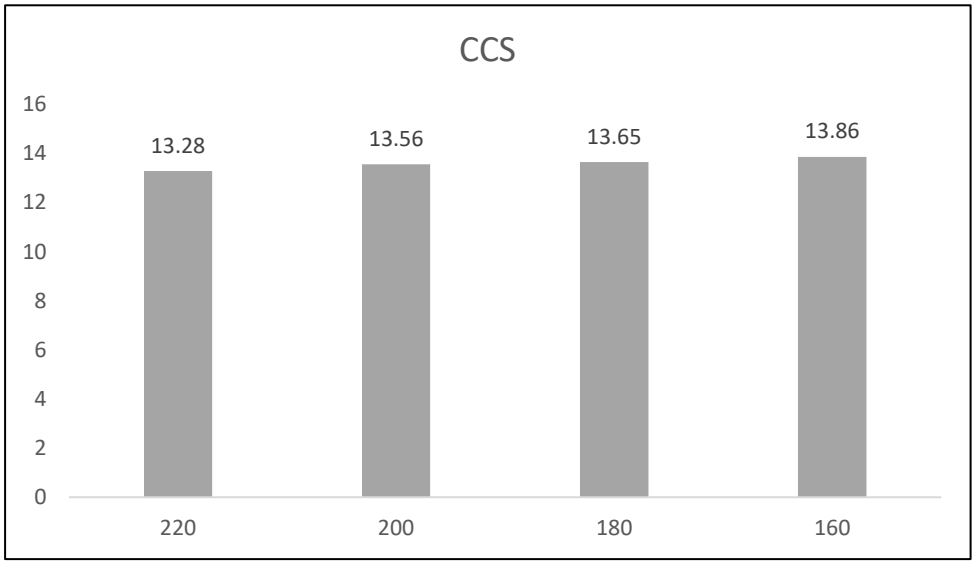


Treatments:
T1 – 220N
T2 – 200N
T3 – 180N
T4 – 160N
T0- 100N

Results:

Harvest Results Year 1:

	Tc/ha	CCS	Ts/ha
T1R1	89.09	13.35	11.89
T1R2	101.65	13.50	13.72
T1R3	103.73	13.00	13.49
T2R1	102.41	13.70	14.03
T2R2	98.78	13.90	13.73
T2R3	103.14	13.10	13.51
T3R1	100.86	13.70	13.82
T3R2	103.82	13.70	14.22
T3R3	101.16	13.55	13.71
T4R1	94.21	14.30	13.47
T4R2	95.51	13.80	13.18
T4R3	99.20	13.50	13.39

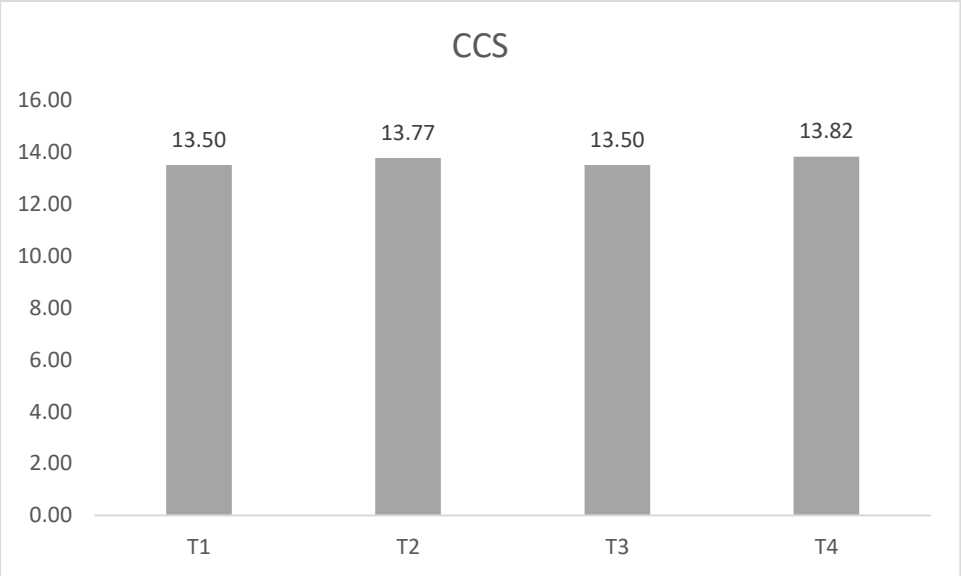


First year results did not show a statistical difference in tc/ha, CCS or ts/ha with yield results ranging from 89t/ha to 103t/ha.

This is unsurprising considering there may be residual N left in the soil from the plant cane crop. The trial has been re-established for a second year with harvest due in 2018

Harvest year 2

	Tc/ha	CCS	Ts/ha
T1R1	102.3	13.7	14.0
T1R2	98.1	13.4	13.2
T1R3	97.2	13.4	13.0
T2R1	101.2	13.6	13.8
T2R2	102.0	13.9	14.2
T2R3	99.1	13.8	13.7
T3R1	105.3	13.9	14.6
T3R2	98.6	13.1	12.9
T3R3	96.0	13.5	13.0
T4R1	101.8	13.4	13.6
T4R2	97.5	13.9	13.5
T4R3	97.8	14.2	13.9



The second year of results again showed no significant difference between any of the Nitrogen treatments in regards to the Tonnes of cane, CCS and ts/ha. This is surprising considering that this is the second continuous year of the trial within the paddock. The overall yield of the paddock is quite low and could be why we are not seeing any difference between the Nitrogen rates. Due to the lower than expected yielding of the paddocks and two consecutive years of no results, this trial has not been continued for a third year.

While the intended purpose of this trial was to identify a CCS difference while dropping Nitrogen rates and this was no recorded, it did show that on a low yielding paddock of Q253 it was possible to reduce the amount of Nitrogen applied by 30% without any noticeable yield penalties. However, this is only one paddock and results could potenetially change on different blocks that have differing soil characteristics, as well as in different years with differing rainfall events.

Conclusions and comments

Advantages of this Practice Change:
The advantage of this practice is that by reducing the amount of Nitrogen applied, the growers is able to save money and also maintain yield throughout the paddock. The grower was able tor reduce the amount of nitrogen by 30% without seeing any yield penalties in the short term.

Disadvantages of this Practice Change:
The disadvantages of this practice include potential yield penalites over the long term due to potential decline of residual Nitrogen in the soil. It is hard to know whether over many crop cycles that reducing the amount of Nitrogen applied will limit yield. Different climates/ weather events will also have a role to play in the loss pathways that may occur throughout the crop cycle. Throughout the duration of the trial it was an exceptionally dry period. Wetter years may have returned different results.

Will you be using this practice in the future:

This trial has allowed the confidence of recommending lower rates to growers in the Mulgrave area when yields are expected to be low. However this will not be the case for all blocks.

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

10%