

Project Catalyst Final Report

Nitrogen Use Efficiency on Q232

Grower Information

Grower Name:	Wilmar
Entity Name:	Wilmar Farms
Trial Farm No/Name:	BKN-00674A 68-3
Mill Area:	Invictor
Total Farm Area ha:	1442.55
No. Years Farming:	
Trial Subdistrict:	Stockham Rd. BRIA
Area under Cane ha:	

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

<u>Plan - Project Activities</u>	Date : (mth/year to be undertaken)	Activities :(breakdown of each activity for each stage)
Stage 1	September 2016	<ul style="list-style-type: none"> • Trial was implemented with 3 different rates (206N, 164N, 147N) along with a 50meter strip of 100N
Stage 2	September 2017	<ul style="list-style-type: none"> • Harvest trial site • Analysis of trial data
Stage 3	October 2017	<ul style="list-style-type: none"> • Reapplication of trial for year two data
Stage 4	October 2018	<ul style="list-style-type: none"> • Harvest trial site • Analysis of trial data

Project Trial site details

Trial Crop:	Sugarcane
Variety:	Q232
Rat/Plt:	1 st Ratoon
Trial Block No/Name:	BKN-00674A 68-3
Trial Block Size Ha:	10.2
Trial Block Position (GPS):	-19.757992° 147.111591°
Soil Type:	2Uge

Block History, Trial Design:

1R → 2R		Aiming for (kg/ha):							Total treatment plot area	Amt. product req. (kg/ha)
Treatments	Products	Rate (kg/ha)	N	P	K	S	Ca			
Zero N	CB 76254	350	0	18	71	23	40	2.67	934	
110 N	CB 91696	500	116	18	71	23	nil	2.67	1335	
150 N	CB 91176	575	150	18	73	20	nil	2.67	1535	
190 N	CB 42697	650	192	18	70	18	nil	2.67	1735	
† Q208 †										
21 rows Q208 with T1										
T1	R3	STOCKHAM ROAD						Plot width	9.780	
T3	R3							Plot length (Google Earth)	910	
T4	R3							Plot area (ha)	0.89	
T2	R3							Rows per plot	6 for fert box	
T1	R2							Reps	3	
T4	R2							No. of treatments	4	
T2	R2									
T3	R2									
T4	R1									
T1	R1							Total rows required	72	
T2	R1							Estimated rows in paddock	80	
T3	R1							Spare rows	8	

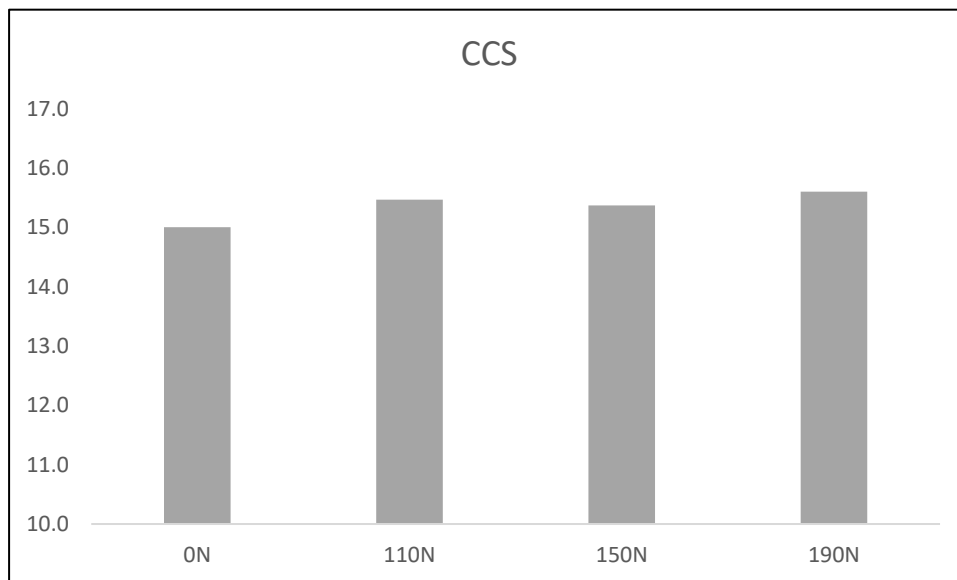
Treatments:

- T1 – 0N
- T2 – 110N
- T3 – 150N
- T4- 190N

Results:

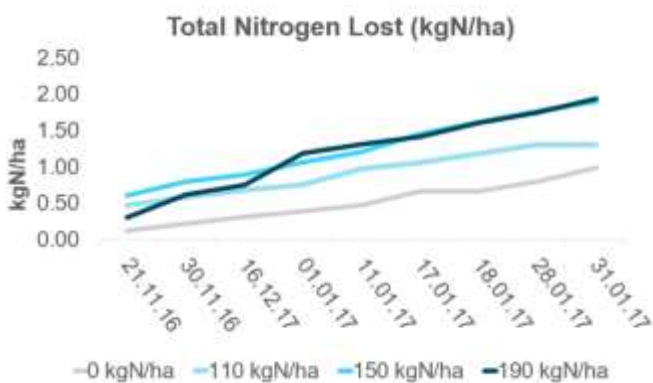
Harvest Results Year 1

	Tc/ha	CCS	Ts/ha
T1R1	51.5	15.1	7.8
T1R2	43.9	15.3	6.7
T1R3	47.1	14.6	6.9
T2R1	87.8	14.9	13.1
T2R2	72.6	16	11.6
T2R3	77.8	15.5	12.1
T3R1	97.1	15.2	14.8
T3R2	81.6	15.7	12.89
T3R3	80.4	15.2	12.2
T4R1	91.8	15.6	14.3
T4R2	84.2	16	13.5
T4R3	87.8	15.2	13.3



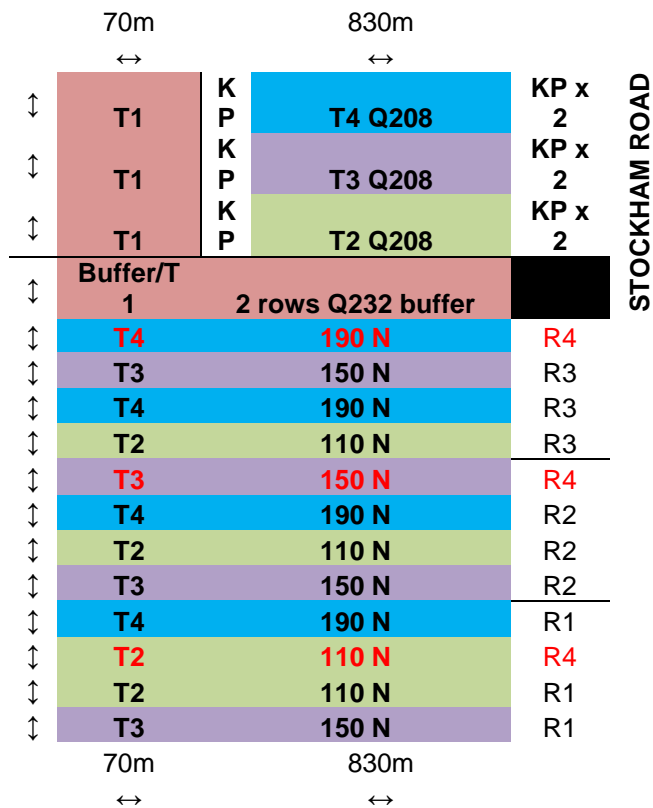
Statistically there was no difference in the CCS for the different Nitrogen Rates.

Water Quality Runoff



The water quality monitoring showed a correlation between applying a higher rate of nitrogen and having a higher % of runoff. However the total amount of runoff was only 1.5% of the total nitrogen applied in this paddock.

The trial has been reapplied for a second year with a slight change of trial plan as seen below.

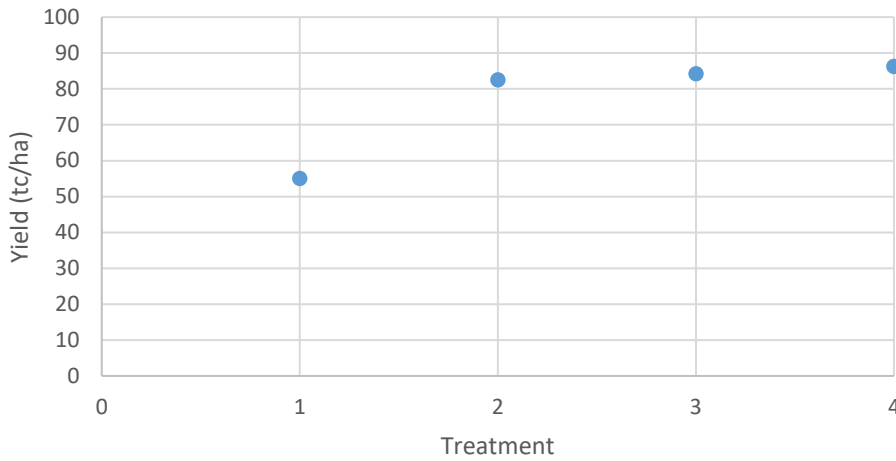


The results from year 2 include:

Treatment	tc/ha		CCS		TS/ha	
	Q232-3R	Q208-3R	Q232-3R	Q208-3R	Q232-3R	Q208-3R
1	55	36	16.9	18.6	9.3	6.6
2	82	73	16.4	18.6	13.5	13.6
3	84	75	16.5	18.6	13.9	14.0
4	86	73	16.6	18.6	14.3	13.6

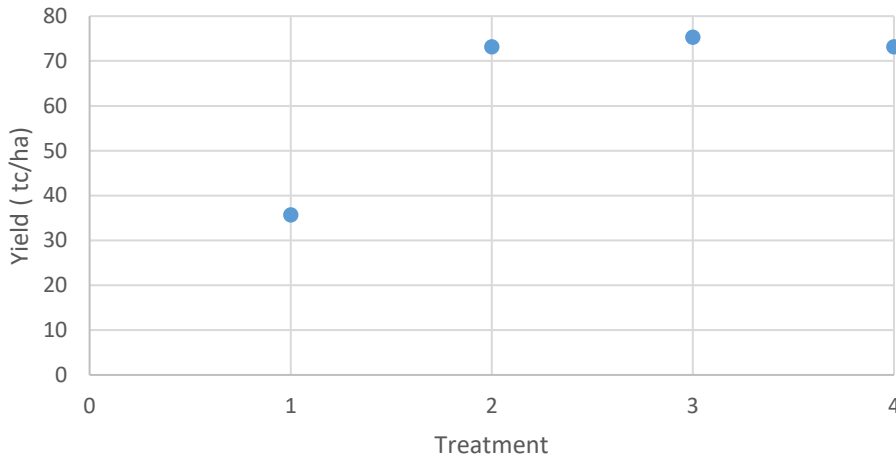
Nitrogen response v yield

Nitrogen Reponse v Yield (Q232)



The above graph shows the increase in cane yield corresponding with an increase in Nitrogen applied in Q232. However once the Nitrogen rate was above 110KgN/ha the response was minimal.

Nitrogen response v Yield (Q208)



This pattern was also observed in the Q208.

Conclusions and comments

Advantages of this Practice Change:

The advantages of this practice change include reduced cost input for fertiliser and decrease in potential losses of fertiliser to the Great Barrier Reef Catchment.

Disadvantages of this Practice Change:

The disadvantages of this practice could include yield loss over time. If the soil has a natural Nitrogen reserve that is aiding the lower N rate treatments, this could be slowly diminished over time, results in yield decline. There is also a risk that during a wet season when N losses are high, the lower Nitrogen rates might not be enough to maintain the crops yield.

Will you be using this practice in the future:

When using these nitrogen rates in the future, it will be done on a block by block basis taking into account many things including soil type, soil constraints both chemical and physical, water availability, flooding potential, yield potential etc. This is to ensure that we are not reducing our rates too far and end up with yield decline.

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

20% + - 15%