Project Catalyst Final Report

Proximal Sensing of Nitrogen

Grower Information	
Grower Name:	Wilmar
Entity Name:	Wilmar Farms
Trial Farm No/Name:	BKN-00674A
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 the use of Proximal sensors to determine crop N uptake infield.

Background: (Rationale for why this might work)
Proximal sensors have been used for many years in horticultural industries to determine crop N uptake. It is thought that this technology can be used within cane, along with satellite imagery to validate N management zones. This has the potential to facilitate structured N application across blocks for site specific management of N.

Potential Water Quality Benefit:
Once data is collected and validated it will be possible to determine high and low yielding zones to zonally apply Nitrogen which can lead to a net reduction of the amount of Nitrogen applied and therefore the amount that can potentially leave the field and enter the Great Barrier Reef

Expected Outcome of Trial:
The expected outcome of this trial is that we will be able to use proximal sensors to distinguish between high and low yielding zones and effectively manage nitrogen surrounding that.

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 (116N, 150N, 192N 0N)
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:**	Q232 1st 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:

Trial Design.

1R → 2R

				Aiming for (kg/ha):					
				18	70	21			
Treatments	**Products**	**Rate (kg/ha)**	**N**	**P**	**K**	**S**	**Ca**	**Total treatment plot area**	**Amt. product req. (kg/ha)**
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

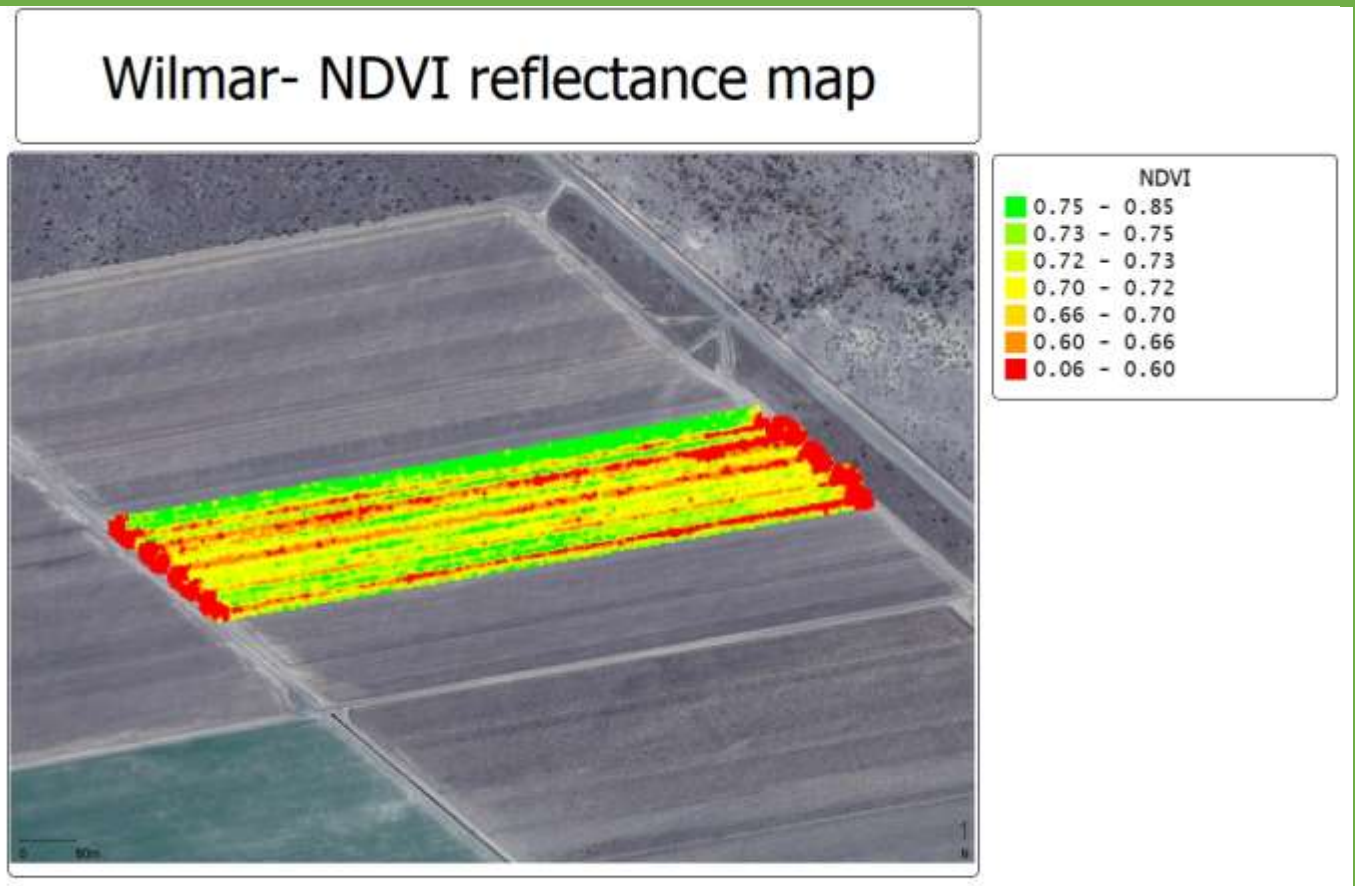
↑ Q208 ↑

21 rows Q208 with **T1**				
T1	R3			
T3	R3		Plot width	9.780
T4	R3		Plot length (Google Earth)	910
T2	R3		Plot area (ha)	0.89
T1	R2		Rows per plot	6 for fert box
T4	R2		Reps	3
T2	R2		No. of treatments	4
T3	R2			
T4	R1			
T1	R1		Total rows required	72
T2	R1		Estimated rows in paddock	80
T3	R1		Spare rows	8

STOCKHAM ROAD

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

Results:



The wilmar site showed very distinct “strips” throughout the trial which were representative of the Zero N treatments. However the other treatments were not obviously distinguishable throughout the trial.
This is representive of what we have found in similar trials, with the 0N nearly always distinguishable, yet the other lower Nitrogen rates are not.

Conclusions and comments

Advantages of this Practice Change:
Advantages of using this practice include visually inspecting what is happening to your cane mid season. Whereas normally growers are unaware of what is happeneing within their paddocks from canopy closure till harvest.

Disadvantages of this Practice Change:
The disadvantages of this practice include that it is not able to be used for nitrogen management as it is only able to pick up 0N plots, not other rates of nitrogen. Drone imagery can only be collected on either full sun days or full cloud cover with no rain or wind. However ground based sensors can only get on the paddock once it is dry which is difficult in an irrigated area.

Will you be using this practice in the future:
Using drones to detect nitrogen is not a viable option at this point in time. While this may change in the future currently not enough information is available to add it to our tool kit for managing nitrogen. However drone's still have their place for identifying other issues in growth which can then be ground truthed to verify the problems.

% of farm you would be confident to use this practice :
0%