

Catalyst Project Report – Final Report

VR N matched to yield potential

| Grower Information | |
|----------------------------|---------------------------------------|
| Grower Name: | Craig Keating |
| Entity Name: | |
| Trial Farm No/Name: | PCK-953A |
| Mill Area: | Wilmar – Plane Creek |
| Total Farm Area ha: | 169 |
| No. Years Farming: | 15 years – 3 rd Generation |
| Trial Subdistrict: | |
| Area under Cane ha: | 140 |

Background Information

Aim: To investigate the effect of variable rate nutrient applications based upon zone crop yield potential

Background: (Rationale for why this might work)

This project will build on previous Catalyst trials that have shown there is the potential to improve nitrogen use efficiency without compromising yield by reducing Nitrogen rates in zones with low cane yield potential.

Through analysis of archived satellite yield data over the previous 16 years, it is possible to identify the locations of potential low yield zones at an intra-paddock scale.

Being able to accurately identify these zones has previously been an impediment to the adoption of Precision Agriculture practices. Using this approach on a paddock scale will assist in validating the process and then measuring the effect of variable rate nutrient applications based on the analysis of the historical yield data.

Potential Water Quality Benefit:
Improved NUE with reduced losses

Expected Outcome of Trial:

Yield zones will be created and a VR map will be produced, lowering nutrient rates in locations of low yield potential and matching nutrient rates in locations of high yield potential.

Service provider contact: Farmacist

Where did this idea come from: Growers

| <u>Plan - Project Activities</u> | Date : (mth/year to be undertaken) | Activities :(breakdown of each activity for each stage) |
|---|---|--|
| Stage 1 | September 2017 | Harvest 2017 cane crop, collect soil samples |
| Stage 2 | October 2017 | Crop sensor block and apply treatments |
| Stage 3 | September 2018 | Harvest trial |

Project Trial site details

| | |
|--|--------------------------|
| Trial Crop: | Sugar Cane |
| Variety: Rat/Plt: | Q208 |
| Trial Block No/Name: | 5-1 |
| Trial Block Size Ha: | 125 |
| Trial Block Position (GPS): | 149.391195, -21.821123 |
| Soil Type: | Karoo, Grey Brown Duplex |

Block History, Trial Design:

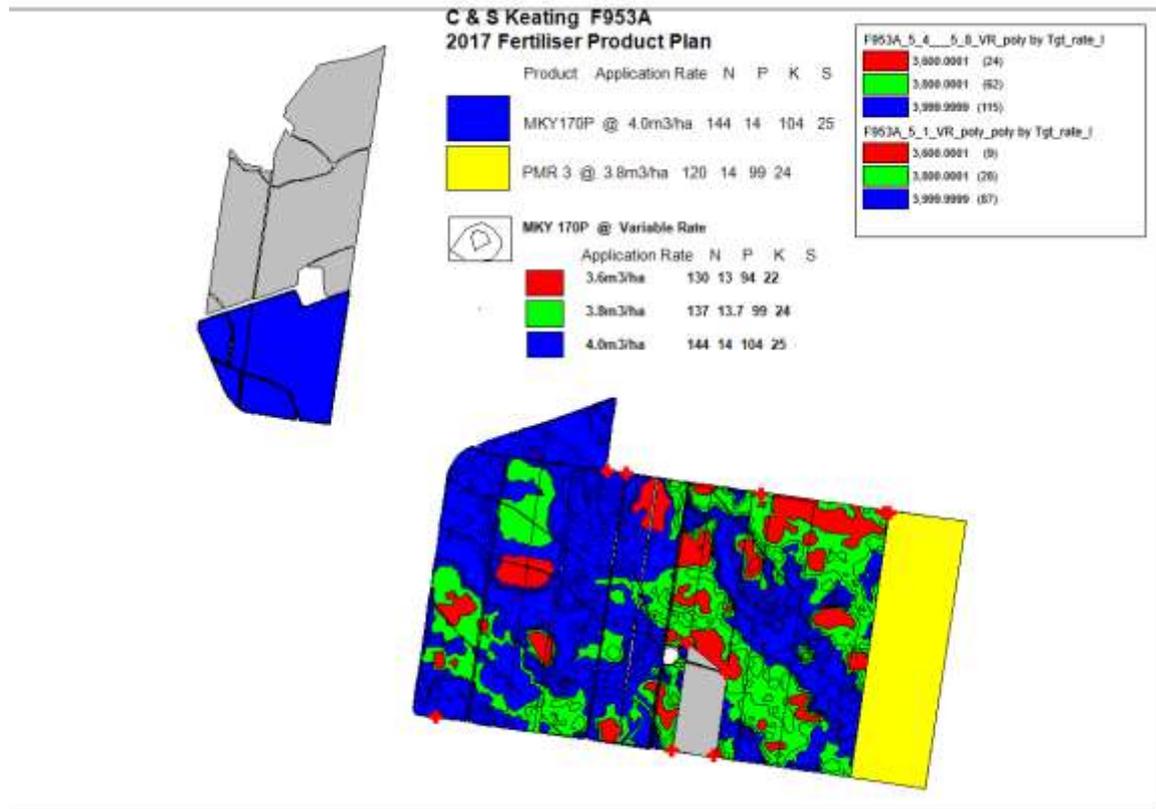


Figure 1 - Farm map indicating variable rate zones across the farm

As a significant investment is required to apply product variable rate, the grower wanted to implement the application method as vastly as possible across the farm as shown in Figure 6.

Treatments:

Results:

To assess the benefit of applying variable rate fertiliser, comparisons were made between the amount of fertiliser applied, compared to what would have been applied if the paddock was applied at a flat rate.

A total of 273 hectares was applied with variable rate fertiliser. The table below shows the areas that were applied at different rates and in turn the amount of nitrogen applied to the paddock.

Table 1 – Nutrient breakdown applied as variable rate compared to flat rate

| | Area (ha) | Total Nitrogen Applied (kg) | Total Phosphorus Applied (kg) | Nitrogen (kg/ha) | Phosphorus (kg/ha) |
|--|------------|-----------------------------|-------------------------------|------------------|--------------------|
| Applied at 3.4 m ³ | 163 | 23635 | 1467 | 145 | 9 |
| Applied at 3.2 m ³ | 81 | 10935 | 648 | 135 | 8 |
| Applied at 2.8 m ³ | 29 | 3480 | 203 | 120 | 7 |
| Total Nutrient Applied by VR | | 38050 | 2318 | | |
| If whole paddock was applied at Full Rate | 273 | 39585 | 2457 | 145 | 9 |
| Nutrient Saved by Applying VR | | 1535 | 139 | 6 | 0.5 |

As shown by the figures above (Table 1), for this paddock, a saving of 1535 kg of nitrogen and 139 kg of phosphorus was made by applying the product at a variable rate. This equated to 6 kg of nitrogen per hectare and 0.5 kg of phosphorus per hectare. Although this number seems small on a hectare basis, it can equate to a significant amount when carried out over a large area. When looking at just the cost of the nitrogen, approximately \$2164 was saved by applying variable rate to this area.

Overall, the product applied to the paddock was reduced by 36 cubic meters, significantly reducing grower costs.

Not only does this reduce cost but it also lowers the risk of adverse environmental impacts by lowering the amount of fertiliser product that is exposed to environmental losses.

Conclusions and comments

The grower was extremely happy with the result of this trial, experiencing no yield losses whilst lowering input costs. He will continue to apply variable rate across this non-uniform section of his farm.

Advantages of this Practice Change:
Decreased fertiliser use and increased profitability
Minimised environmental losses

Disadvantages of this Practice Change:
Cost of initial equipment set up

Will you be using this practice in the future:
Yes

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

Site complete

