



GameChanger



CASE

STUDY



THE GAMECHANGER PROGRAM IS MANAGED BY **REEF CATCHMENTS (MACKAY WHITSUNDAY ISAAC) LIMITED NRM GROUP** IN THE MACKAY-WHITSUNDAY REGION.

TRIAL: Adjustment of nutrient application rates -
Based on yield potential of older ratoons

LANDHOLDER: Adam Keilbach

LOCATION: Munbura, 10 km west of Sarina

CATCHMENT: Alligator Creek

RAINFALL: 1750 mm

PROPERTY SIZE: 527 ha

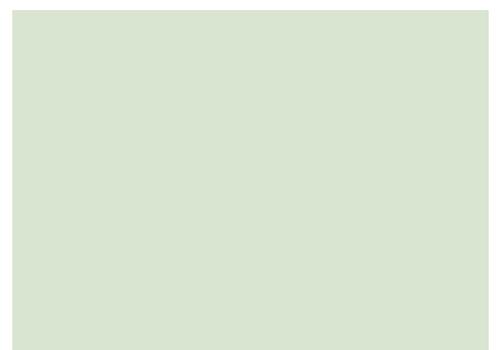
LANDUSE: Sugarcane



GameChanger... Innovation in SugarCane



The fast-tracking adoption of 'game changing' sugarcane nutrient and pesticide management practices (GameChanger) project is funded by the Australian Government Reef Programme. GameChanger management practices focus on the use of precision agriculture technologies and advanced planning to provide opportunities for cane farming to be more economically and environmentally sustainable.



GOAL

This project aims to determine the nutrient rates that need to be applied to match reduced cane yield potential in older ratoons. Quite clearly, there is scope to improve the nitrogen use efficiency of older ratoons by decreasing nitrogen application rates in line with yield decline.

OVERVIEW

YIELD LOSS EXPLAINED

Despite the best management efforts of any grower, yield loss associated with aging ratoons occurs within all sugar cane blocks and across all cane varieties.

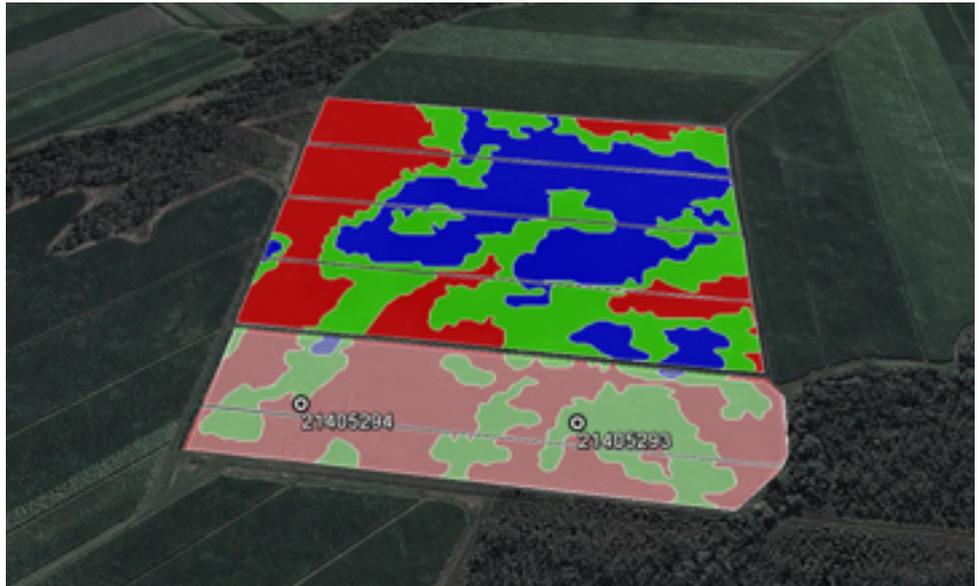
Some cane varieties have faster rate of decline than others, but the Moses project reported that on average, production yields for plant and first 1st ratoon are almost identical with yield loss beginning in the 2nd ratoon crop. Yield losses then continue at a constant rate of decline at approximately 4% – 5% each year. Predominantly yield decline in older ratoons is caused by the effects of harvester damage and the impacts of pest and disease on cane root systems.

Cumulatively the yield loss (as expressed against the yield achieved as plant cane) reaches 15% by 5th ratoon, 25% by 7th ratoon and accelerates sharply to 37% loss for ratoons older than 8 years (Figure 1).

WITH APPROXIMATELY 15% OF THE TOTAL CANE CROP EXPECTED TO BE IN THE FINAL STAGE OF THE CROP CYCLE IN ANY GIVEN YEAR, THERE IS AN OPPORTUNITY TO SIGNIFICANTLY REDUCE THE LEVEL OF NUTRIENTS IN THE CROP WITH MINIMAL RISK OF YIELD DECLINE IF WIDESPREAD ADOPTION IS ADVANCED.

THIS PROJECT IS COORDINATED ON-GROUND BY REEF CATCHMENTS, MADE POSSIBLE THROUGH FUNDING FROM THE AUSTRALIAN GOVERNMENT REEF PROGRAMME.

FIGURE 2 EC Deep soil boundary map and location of site specific soil samples.



CURRENT ACTION

The site chosen for the trial was a block of Q208 4th ratoon that Adam had indicated would be ploughed out after one more season. The site had been previously EC mapped and this showed relatively consistent soil across the trial block (Figure 2). This was confirmed with analysis of samples taken from the site that also showed consistency in the results obtained.

After the penultimate harvest in 2014, Farmacist staff and Adam developed a site plan to allow for commercial strips to be established with different nutrient rates as compared to the grower standard. Consultations with the grower established a program to lower application rates of all nutrients by 12.5% and 25% as compared to the normal grower rates (Table 1).

The trial site was harvested on September 30, 2015.

ECONOMIC ASSESSMENT UNDERTAKEN FOR THE SITE BY THE STATE DEPARTMENT OF AGRICULTURE AND FISHERIES (DAF) INDICATED GROWER COST SAVINGS OF 15% AND 8% RESPECTIVELY FOR T1 AND T2 IN COMPARISON TO THE CONTROL TREATMENT.

OUTCOMES TO DATE



Improvements in Nitrogen Use Efficiency (NUE) of more than 20% were realised in the 120 N application treatment compared to the grower standard rate.

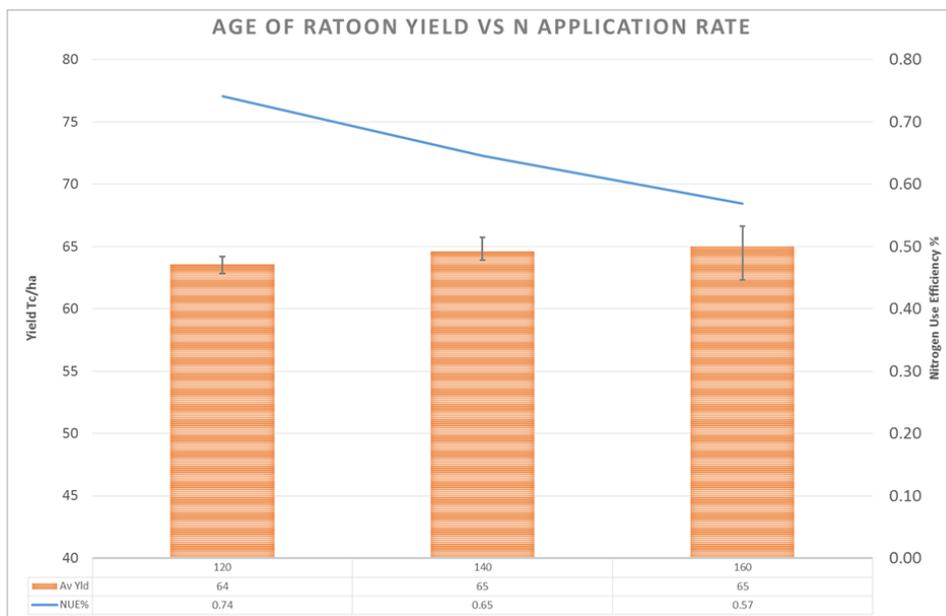
The results achieved at this site for the 2015 harvest would appear to indicate that lower levels of nutrients will not further decline yields, when applied at locations where the crop age has already diminished yield potential.

The trial has shown that reductions in nutrients in older ratoons has no impact on productivity and improves gross margins and offers water quality benefits for the Great Barrier Reef and surrounding local catchments.

TABLE 1

Treatment	Product	Rate (m3/ha)	N (kg/ha)	P (kg/ha)	K (kg/ha)	S (kg/ha)
T1	MKY-190P	3.1	120	11	80	20
T2	MKY-190P	3.6	140	13	93	23
Control	MKY-190P	4.2	160	15	108	26

FIGURE 3 2015 cane yield and NUE from Adam Keilbach aged ratoon site



KEY FINDING:

EVEN THOUGH THE FERTILISER APPLICATIONS WERE REDUCED BY 12.5% AND 25% THERE HAS BEEN NO DECLINE IN CANE OR SUGAR YIELD (FIGURES 3 AND 4).

FIGURE 4 2015 sugar yields from Adam Keilbach aged ratoon site

