

PRACTICE FACT SHEET

EVALUATING THE APPLICATION OF REDUCED NUTRIENTS ON OLD RATOONS WITH A LOW YIELD POTENTIAL



Project Catalyst is a grower-led innovation project in sugar cane that was formed to explore and validate farm management practice change leading to improved water quality for the Great Barrier Reef.

BACKGROUND

Sugarcane is generally a 4 to 6-year crop depending upon the number of times a grower will ratoon their blocks. Despite the best management efforts of growers, yield loss associated with aging ratoons occurs within the majority of sugar cane blocks and across all cane varieties. There are several reasons why crop vigor is lost and yield potential declines, but it is mostly driven by a combination of compaction, harvester damage and soil degradation. The Moses project conducted in the Mackay region between 2011 and 2013 reviewed multiple cane yield datasets and established that cane yields in plant and 1st ratoon are generally the same, however there is a decline in yield in 2nd ratoons and that this decline continues at a constant rate of between 4 and 5 percent per year. Cumulatively, the

yield loss (as expressed against the yield achieved as plant cane) reaches approximately 15% by 5th ratoon, 25% by 7th ratoon and accelerates sharply to more than 37% reduction for ratoons 7 years and older. Historically, no formal trials have been undertaken to investigate the nutrient requirements in older ratoons, however anecdotal evidence suggests nutrient inputs could likely be reduced without impacting crop growth and yield.

Forward-thinking growers have identified that the diminishing returns of older ratoons presents an opportunity to progressively lower the amount of nutrient input each year a block is ratooned, with no impact to crop growth. The primary saving has been identified in nitrogen application, with additional savings to phosphorous, sulphur and potassium typically applied

with nitrogen. Adapting fertiliser use to the yield potential is a valuable strategy to increase nutrient use efficiency, reduce losses and increase net profitability. Furthermore, additional environmental benefit can be achieved through reducing excess nutrient entering waterways in irrigation run-off.

A number of innovative growers across all catchments involved with Project Catalyst have been involved in a series of trials in their regions investigating reducing nutrient input in older ratoons. It was anticipated that these trials would provide evidence for decreasing nutrient input with crop age, whilst having no impact to crop growth and yield. In order to test this, growers compared the cane yield between older ratoon blocks (5R+) which had conventional nutrient rates applied versus reduced nutrient rates.

TRIAL RESULTS

In all trials undertaken, the results demonstrated that reducing the nutrient applied to older ratoons did not impact cane yield. The results of a trial from the Mackay-Whitsunday region are provided in Table 1, where analysis of the harvest cane yield results demonstrated no statistical difference in production between three treatments of varying nitrogen applications conducted on fifth and sixth ratoon cane.

Treatment	Nitrogen (kg/ha)	Cane (t/ha)	Sugar (t/ha)
1	160	64	11.3
2	140	65	11.2
3	120	65	11.3

Table 1 - Trial results from a reduced nutrient trial on 5R and 6R blocks in the Mackay region, showing no statistical difference in yield between conventional (160 kg/ha nitrogen) and reduced (120 kg/ha nitrogen) nutrient applications



Results from a separate trial are provided in Figure 1, demonstrating little variation to yield (ts/ha) across three different nitrogen application rates on late harvest cane with a low yield potential.

A similar trial undertaken in the Plane catchment at Carmila reported a saving of approximately 3,350kg of

nutrient product was made across the farm, equating to a nutrient saving of 40kg/ha by reducing rates on older cane.

All growers involved in the trials are now using reduced nutrient rates on older ratoons as standard practice, due to the extremely positive results achieved. The result achieved at the

Catalyst project sites would indicate a significantly positive environmental outcome. If this practice were to be broadly adopted, a reduction of approximately 1,250 tonnes of applied nitrogen per annum across all catchments adjacent to the GBR lagoon could be achieved.

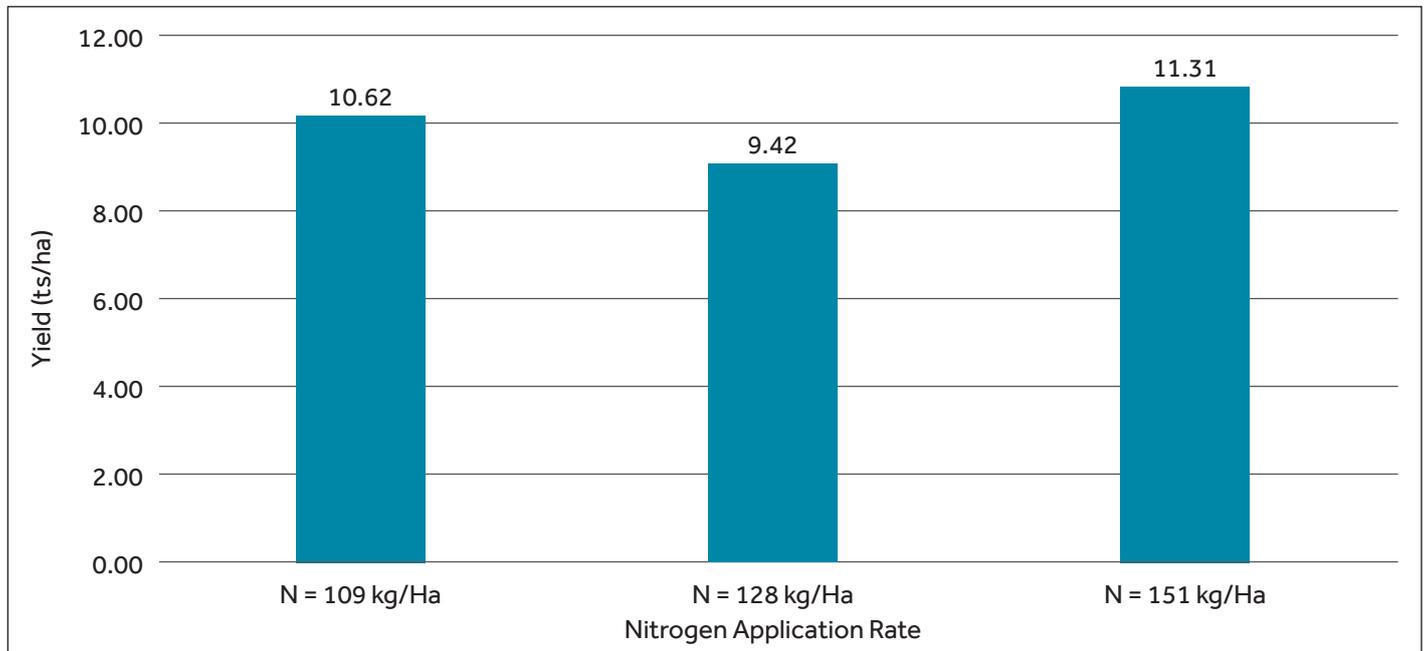


Figure 1 - Trial results show little variation to yield (ts/ha) across different nitrogen application rates on late harvest cane with a low yield potential.

FURTHER APPLICATION

This practice has also proved beneficial in other situations through additional Project Catalyst trials. For example, split rate or variable rate within block nutrient application has shown identical results where paddocks with known low-yield zones have had varied rates of nutrient applied for economic

and environmental benefits, with no impact on yield. Decreasing nutrient application has also proven valuable in situations where a late harvest has reduced the yield potential of the subsequent crop with significant savings made through reducing inputs.

