

Poster paper

Does ratoon age impact on N-fertiliser requirements in the Wet Tropics?

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The continuous improvement and cyclical learning within the SIX EASY STEPS nutrient management program contributes to the productivity, profitability and environmental sustainability of the Australian sugar industry. Emphasis on fine-tuning the SIX EASY STEPS nitrogen (N) fertiliser guidelines for specific circumstances, including climate, harvest time, position in the landscape and older ratoons is the focus of many research projects.

The impact of increasing ratoon age on N requirements was evaluated using data generated from two small-plot N-response experiments conducted at Tully (T1 and T2) between 2011 and 2017 on a poorly drained soil formed on alluvium (Bulgun series). A linear mixed model, which considered the crop classes as repeated measurements, was fitted to the mean annual cane-yield data. In this model, N treatments (kg N/ha), crop classes (first ratoon to sixth ratoon at site T1 and first ratoon to fifth ratoon at site T2) and the interaction were considered as fixed effects. Where there were significant effects, a Tukey's multiple comparison test was used to determine which means differ at the 5% significance level.

There was no statistically significant interaction between N rate and crop class at these sites. This indicates that N requirements were similar for all crop classes. Crop class had a statistically significant effect on mean cane yields. However, older ratoons did not yield significantly less than young ratoons. For example, at site T1 there was no statistically significant difference in mean cane yields among the first-, third- and sixth-ratoon crops. The mean cane yields of all crops at both trial sites were comparable to the Tully mill annual average cane yields for 2012 to 2017. This suggests there were no other constraints affecting crop growth or responsiveness to applied N at the trial sites and that the climatic conditions experienced during the growing season were largely responsible for the year-to-year variability observed in mean cane yields.

The statistical analysis is being extended to investigate the interaction between N rate and crop class on N-use efficiency and profitability. In the meantime, greater emphasis should be placed on assessing crop performance to identify underlying crop growth and N-response constraints and ameliorating these where possible rather than simply reducing N rates in older ratoons.

Key words Ratoon, nitrogen, SIX EASY STEPS