

## POSTER SUMMARY

## LEAF NITROGEN ANALYSIS AND INTERPRETATION: A PRELIMINARY INVESTIGATION INTO IMPROVING THE RELIABILITY OF CRITICAL CONCENTRATIONS THROUGH THE INCLUSION OF CROP BIOMASS

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### Abstract

Leaf analysis is widely used for sugarcane nitrogen (N) management since difficulties are associated with the accurate diagnosis of crop N requirements and status through soil testing. However, it is known that leaf N concentrations decline sharply with advancing crop age (biomass accumulation) and this phenomenon introduces uncertainties in terms of identifying threshold (critical) values for interpretive purposes. Currently, in order to minimise the complications of ageing effects on the interpretation of data, specific ranges in physiological age are stipulated for the taking of leaf samples. However, a method of more accurately accommodating the effects of age on critical N concentrations is urgently required, and is the focus of this paper. Field N response trials were established in the rainfed and irrigated regions of the South African sugar industry and data were collected for two crops from each trial. Leaf sample composition and biomass measurements were undertaken from crop ages of three to seven months. Critical N concentrations were established from relationships between leaf N concentrations and final stalk yields. Critical N values established at each sampling event were also related to stalk biomass. It was found that critical N values declined exponentially with increasing biomass ( $R^2=0.73$  for the irrigated region,  $R^2=0.77$  for the rainfed cane and for combined data  $R^2=0.74$ ). These findings point to the potential for improving the reliability of the interpretive process for leaf N through the inclusion of estimates of stalk biomass at the time of sampling.

*Keywords:* sugarcane, leaf analysis, nitrogen, biomass accumulation, critical nutrient concentrations, crop age