

## POSTER SUMMARY

**YIELD VARIABILITY MAPPING FOR A CUT AND STACK SYSTEM**TWEDDLE PB<sup>1</sup>, HARRIS A<sup>2</sup>, MAKHAYE A<sup>1</sup> AND RAPSON B<sup>2</sup><sup>1</sup>South African Sugarcane Research Institute, P/Bag X02, Mount Edgecombe, 4300, South Africa<sup>2</sup>Tongaat Hulett Limited, Amanzimnyama Hill Road, Tongaat, 4400, South Africa

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**Abstract**

The development of infield yield maps is an essential component of precision agriculture enabling refined and more accurate investigation and treatment of infield variability. In a collaborative effort between SASRI and Tongaat Hulett on a miller cum planter (MCP) cut and stack operation, two field operations of adjacent proximity totalling 16 hectares were surveyed and analysed for yield variability. Individual daily cutter task areas were surveyed and used to determine the yields from the corresponding stack weights measured on the transloading zone. The two sites represented a range of field conditions across variable aspects, slopes and field positions. The results indicate a wide yield variability, ranging from approximately 30 to 160 tons per hectare across the two fields. Such yield variations across fields indicates the importance of further research that is required to develop practical, effective means of determining yields and yield variability routinely. This research forms part of a SASRI project investigating yield variability mapping using various techniques across a range of commercial harvesting and loading practices. This poster provides an overview of the results obtained from the field surveys, showing the yield variability across the fields. Techniques to practically obtain such yield variability maps are explored. GIS techniques to smooth the results are proposed in order to develop variable application maps for precision agriculture use. A case study to determine the economic benefit of applying precision agricultural techniques to optimise fertilizer use is explored. Further research and development opportunities are highlighted.

*Keywords:* cut and stack, precision agriculture, yield mapping