

POSTER SUMMARY

BIOTECHNOLOGY ADVANCES IN SUGARCANE AGRICULTURESNYMAN SJ^{1,2}¹South African Sugarcane Research Institute, P/Bag X02, Mount Edgecombe, 4300, South Africa²University of KwaZulu Natal, School of Life Sciences, Westville Campus, Private Bag X54001, Durban, 4000, South Africa

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Abstract

Biotechnology can be broadly defined as ‘the use of living things to make or change products and processes’. Over the past 20 years, the South African Sugarcane Research Institute has advanced sugarcane agriculture by developing and capitalising on these modern techniques. For example, conventional breeding efforts have been strengthened by marker assisted breeding where screening populations for the presence of certain DNA markers, e.g. *Bru1* for brown rust resistance, can indicate whether the desired characteristic is present in progeny and parents. In addition, significant research progress has been made using genetic modification (GM) technology and proof of concept in the field has been demonstrated for traits such as herbicide tolerance and *Eldana saccharina* Walker (Lepidoptera: Pyralidae) stalk borer resistance. Similarly, pathogen detection and identification has been greatly enhanced with diagnostic molecular techniques such as tissue blots for Sugarcane Yellow Leaf Virus and reverse transcription polymerase chain reaction for Sugarcane Mosaic Virus. The use of tissue culture has facilitated the micropropagation of disease-free and true-to-type seedcane via NovaCane®, and valuable germplasm can be conserved by storage at 18°C in small containers in a laboratory growth cabinet. Cultivar identity can be verified using DNA fingerprinting, and strides are being made to sequence the sugarcane genome to gain further knowledge on how to maximise yields in this important and diverse crop.

Keywords: biotechnology, fingerprinting, pathogen detection, tissue culture, breeding, marker assisted selection, genome sequencing