

POSTER SUMMARY

SUGARCANE *IN VITRO* GERMPLASM CONSERVATIONBANASIAK M¹ AND SNYMAN SJ^{1,2}¹South African Sugarcane Research Institute, P/Bag X02, Mount Edgecombe, 4300, South Africa²School of Life Sciences, University of KwaZulu-Natal, P/Bag X54001, Durban, 4000, South Africa

marzena.banasiak@sugar.org.za sandy.snyman@sugar.org.za

Abstract

As sugarcane is vegetatively propagated, germplasm collections of commercial lines and ancestral breeding material are maintained in the field. These valuable assemblages are costly to maintain and vulnerable to environmental hazards. Consequently, *ex situ* conservation options have been developed using *in vitro* storage methodologies through slow growth and cryopreservation. For medium-term storage (i.e. a few years) *in vitro* plantlets of sugarcane cultivar NCo310 were maintained in slow growth conditions at both 18°C and 24°C and on four semi-solid media: (i) SG1-Murashige and Skoog (MS) salts and vitamins with 20 g L⁻¹ sucrose; (ii) SG2-½MS with 10 g L⁻¹ sucrose; (iii) SG3-MS with 20 g L⁻¹ sucrose and 1 mg L⁻¹ abscisic acid (ABA); and (iv) SG4-½MS with 10 g L⁻¹ sucrose and 1 mg L⁻¹ ABA. At 18°C, all media supported storage for 48 months with sub-culturing every 12 months. Shoot multiplication post-retrieval was significantly higher on the SG2 medium compared with the non-stored control (362 ± 84 and 126 ± 26 shoots per recovered shoot after two months, respectively). In addition, shoots could be maintained for 48 months on SG2 medium with one subculture without compromising post-storage multiplication ability. At 24°C, storage on all four media supported recovery and multiplication of shoots for eight months. Cryopreservation (i.e. long term storage at -196°C) of cultivar NCo376 *in vitro*-derived shoot meristems using the V-cryo-plate method demonstrated survival rates of 41.7 ± 4.8 to 69.4 ± 10%. Both the above storage methods are being used to conserve valuable germplasm at the South African Sugarcane Research Institute.

Keywords: minimal growth, slow growth, cryopreservation, apical meristem, shoot retrieval, shoot multiplication