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RESEARCH PAPER

Effect of various concentrations of plant growth regulators and commercial sugar on meristem tip culture on commercial sugarcane variety CoA92081 (87A298)

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Abstract : The effect of plant growth regulators and commercial sugar concentration on *in vitro* morphogenesis of commercial sugarcane variety CoA92081 (87A298) through meristem tip culture was tested. Data on initiation (%), multiplication (%), effect of NAA on rooting (%) and effect of NAA and sugar concentration on rooting (%) were subjected for statistical analysis. Initiation was found to be superior at MS media supplemented with 0.20mg/l BAP and 0.1mg/l KN (80.17) followed by multiplication at MS media supplemented with0.25mg/l BAP and 0.1mg/l KN (84.15) which was significantly superior over other treatments. Rooting per cent was found to be superior at ½ strength MS media supplemented with 5mg/l NAA with 3 per cent sugar (51.48). Among various concentrations tested, 3 per cent commercial sugar appeared to be optimum for shoot regeneration and the same can be used for multiplication and 4 per cent commercial sugar appeared good for rooting along with 5mg/l NAA (84.43). This protocol provides a successful technique that can be used for rapid propagation.

Key Words : BAP, KN, Micro propagation, NAA, Sugarcane

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INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) is one of the most efficient converters of solar energy into sugars and other renewable forms of energy. The plant has emerged as a multipurpose crop providing not only sugar but also a series of value added products such as paper, ethanol and other alcohol derived chemicals, animal feed, antibiotics, biofertilizers and raw material for generating electricity.

Sugarcane, being a vegetative propagated crop has a low seed multiplication rate. Hence, unavailability of quality seed material is one of the major problems faced by farmers in developing countries. Further, the bulky cane cuttings used for planting as seed harbour many pests and diseases there by decreasing cane yield and quality drastically. In fact, poor quality seed is a major constraint in sugarcane production. Plant tissue culture techniques are emerging as a powerful tool for rapid and large scale multiplication of newly released and commercially important varieties of sugarcane. Initial attempts to regenerate plants through *in vitro* techniques were conducted on sugarcane by Nickell (1964) and Heinz and Mee (1969). Protocols for *in vitro* plant regeneration of sugarcane through callus culture, axillary bud and shoot tip culture have been developed by many authors (Lee, 1986, 1987; Nagai, 1988; Baksha *et al.*, 2002). One of the major obstacles to the *in vitro* micro propagation of plants is the genotype / media interaction and rooting of the plantlet. Sugarcane is a highly heterozygous, polyploid and aneuploid crop (Jannoo *et al*., 1999) and as a consequence the frequency of shoot differentiation from apical shoots in most sugarcane varieties varies greatly in number (Siddiqui *et al.*, 1994). Mulleegadoo and Dookun (1999) examined the effect of

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