

**DETERMINATION OF OPTIMAL AUXIN AND  
CYTOKININ LEVELS FOR MERISTEM  
CULTURE OF SUGARCANE (*Saccharum* HYBRID  
SPP.): VARIETY SL 96 328**

A dissertation submitted to the  
Faculty of Animal Science and Export Agriculture of  
Uva Wellassa University  
in partial fulfillment of the requirements for the award of the degree of  
Bachelor of Science in Export Agriculture

By  
**RATHNAYAKA MUDIYANSELAGE BHAGYA SAMANMALI RATHNAYAKA**

**Faculty of Animal Science and Export Agriculture  
Uva Wellassa University**

**2013**

## ABSTARCT

Sugarcane plants can be multiplied rapidly by aseptic culture of meristematic explants under controlled nutritional and environmental conditions to produce disease free planting materials even at commercial scale. Though there is a standard meristem culture protocol, perfection of this protocol with respect to phyto hormone levels is important in maximizing the efficiency of this technology when it deals with different varieties. This research was conducted to find out the optimum cytokinin [6-Benzylaminopurine (BA) and Kinetin] levels for shoot germination from meristematic explants and for shoot multiplication under passage culture of variety SL 96 328. Optimum Auxin [ $\alpha$ -Naphthalene acetic acid (NAA) and Indol-3-butyric acid (IBA)] levels for root development in *in-vitro* generated multiple shoots were also investigated for the variety SL 96 328. The results revealed that increased levels of BA lead to increase the mortality of meristematic explants in culture. The treatment combinations with BA and Kinetin levels (mg/l) 0.01 BA + 0.05 Kinetin, 0.01 BA + 0.02 Kinetin, 0.05 BA + 0.05 Kinetin, 0.05 BA + 0.001 Kinetin, 0.1 BA + 0.02 Kinetin and 0.1 BA + 0.001 Kinetin were found as the best combinations to be used in shoot germination. The tested combinations of same hormones with levels, BA and Kinetin (mg/l) 0.05 BA + 0.01 Kinetin, 0.03 BA + 0.02 Kinetin, 0.2 BA + 0.05 Kinetin, 0.03 BA + 0.01Kinetin, 0.01 BA + 0.1 Kinetin were found to be the best combinations for shoot multiplication in passage culture. Use of auxins with concentrations (mg/l) of IBA and NAA (mg/l) 0.5 IBA + 0.05 NAA mg/l, 3.0 IBA + 0.2 NAA mg/l, 3.0 IBA + 0.05 NAA mg/l and 3.0 IBA + 0.03 NAA mg/l were found to be the best for root development in multiple shoots of variety SL 96 328.

Key words – auxins, cytokinins, sugarcane, meristem culture, *in-vitro* propagation.