

DEVELOPMENT OF BANANA CULTIVARS RESISTANT TO PHYSIOLOGICAL DISORDER THROUGH GENETIC MANIPULATION TECHNIQUES

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Introduction

Banana has a potential to be a major exporter commodity of Malaysia. The major constraints of banana production are stress factors, which resulted in physiological disorders and poor agronomic characteristics. Conventional breeding of bananas to produce desirable plants remains a problem because of high sterility and polyploidy level. Hence, *in vitro* and molecular genetic techniques have great potential for the genetic improvement of bananas. The objectives of the study was to develop superior stress-tolerant banana plants using *in vitro* manipulation.

Materials and Methods

Shoot tips from different banana cultivars were used to study the shoot multiplication capacity using BAP. Callus induc-

tion studies were carried out with different types of explants (shoot-tip, rhizome, basal leaf-sheath, leaf and scalp) using different levels of auxins. Regeneration into plants from selected callus tissues were investigated with different concentration of BAP.

Results and Discussion

Direct regeneration studies were successfully carried out using BAP in 35 bananas cultivars and high multiplication rate was observed in treatments supplemented with 5 mg/L BAP. Callus tissues were easily initiated but 2,4-D was observed to produce desirable callus with characteristics conducive for plant regeneration. Callus cultures initiated on MS media with low 2,4-D produced somatic embryos within two months of culture. Regeneration has been achieved by somatic embryogenesis where embryos give rise to whole plant using 5 mg/LBAP. When callus were transferred to liquid media and agitated, suspension cultures initiated and established. Determination of cell viability in suspension culture was carried out by reading the absorbance at 485nm. Plantlets, callus and cell suspension cultures obtained the study were selected for tolerance to different stress factors, acidity, drought, salinity and aluminium toxicity.

Conclusions

Bananas plants tolerant to different stress conditions have been selected and now are being further tested in the glass-house.