

## Cryopreservation technology for conservation of selected vegetative propagules

### Abstract

Cryopreservation is the science of freezing biological materials and their subsequent storage at very low temperature in liquid nitrogen ( $-196^{\circ}\text{C}$ ). At such low temperature, metabolic rates are low or completely halted. Recently the need to conserve plant materials has increased tremendously due to extinction. Plants that produce orthodox seeds can be easily stored in the form of desiccated seeds at low temperature being the most convenient method to preserve plant germplasm. However, it is not applicable to crops that do not produce seed (e.g. bananas) or with recalcitrant or intermediate seed. In addition cryopreservation is now recognized as a powerful tool for the preservation of the unique genomic constitution of cultivars, tissue cultured lines and hybrids such as orchids. Various protocols, ranging from conventional slow freezing to the more modern vitrification based protocols have been established and utilized for various plant materials. To date there is still only limited number of plants whereby cryoconservation is readily used mainly because the techniques need to be adapted for each species. Therefore, continued efforts are needed in cryopreservation techniques to develop protocols for a wider range of plants. Conservation of plant germplasm has moved forward from the more costly slow cooling to vitrification based strategies. For effective adoption of the technique, simple reliable method with high regeneration ability has to be established. Our research in various plants has shown selection of plant material to be one of the most important steps in obtaining successful cryopreservation. In addition, different vitrification protocol can influence the success rate as well. This paper will highlight the importance of explant selection and the importance of method selection for successful cryopreservation using some selected crops.

**Keyword:** Conservation; Cryoconservation; Propagule; Vitrification