CONSERVATION OF PLANT GENETIC RESOURCES USING CRYOPRESERVATION

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Plant Cryopreservation is the preservation of plant species in the form of plant materials outside natural habitats (ex situ conservation), including DNA, pollen, buds, dormant buds, embryonic axes, zygotic and somatic embryos, and seeds at ultra-low temperature (-130°C) but generally prefer to store plant materials using liquid nitrogen at -196°C. The physical and metabolic cellular processes are effectively stopped, and then cryopreserved plant materials can be recovered and grown to regenerate a whole plant after cryopreservation. Plant cryopreservation has been developed since 1960 with the principles of slow cooling and vitrification. There are 7 major steps (1. preculture, 2. osmoprotection, 3. dehydration, 4. store in liquid nitrogen, 5. rapid thawing, 6. unloading, and 7. recovery) generally used for successful plant cryopreservation. The developed methods from the beginning are: 1. Dormant buds, 2. Slow freezing, 3. Vitrification, 4. Encapsulation-dehydration, Encapsulation-vitrification, 6. Droplet-vitrification, 7. V cryo-plate, and 8. D cryo-plate. It is an alternative method for a long- termed plant conservation using less space, less cost, and no environmental effects. Although in some cases, such as storing seeds at -20°C, is more appropriate and less expensive than storage in liquid nitrogen and buds can be stored at -4 to -80°C, but the storage cannot last long. At present, the recent cryopreservation methods use a shorter time, unskillful labors, simple equipment with high survival. In addition, many countries adopt these methods to use for their germplasm storage.

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