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2nd INTERNATIONAL WORKSHOP DESICCATION TOLERANCE AND SENSITIVITY OF SEEDS AND VEGETATIVE PLANT TISSUES FRANSCHHOEK SOUTH AFRICA 6 - 11 JANUARY 1997

GUEST EDITORIAL

Furthering the understanding of biological mechanisms underlying desiccation sensitivity and tolerance of seeds and vegetative plant tissues is of direct relevance to the mandate of the International Plant Genetic Resources Institute (IPGRI), which is to advance the conservation and use of plant genetic resources for the benefit of present and future generations. For this reason IPGRI responded positively to the request of the workshop's organizers to sponsor this Special Issue of Seed Science Research.

IPGRI undertakes various research activities in collaboration with national programmes, research institutes and universities in Africa and elsewhere, which aim at developing and/or improving *ex situ* conservation technologies, with a strong focus on 'low-tech' approaches. Projects on orthodox seed conservation include research on the effect of ultra-dry storage with the aim of exploring practical low-cost techniques for safe storage in circumstances where refrigeration cannot be provided. Another example is the use of solar energy for drying seeds. The investigation of the relationship between critical seed water content and storage temperature as well the accuracy of different vigour assays to assess best the critical water content value are other examples of research in this category.

Many plant species produce seeds which cause problems in storage. A number of species, predominantly tropical or sub-tropical, produce recalcitrant seeds, i.e. they are unable to withstand much desiccation and are often sensitive to chilling, and therefore, cannot be stored in the long-term. Seeds with intermediate storage behaviour can tolerate desiccation to fairly low moisture content but the dry seeds are often injured by low temperature. The storage life of these seeds can be prolonged by further drying, but it is still impossible to obtain longevity comparable with that of orthodox seeds. For species which do not produce seeds or are predominantly vegetatively propagated, conservation in seed form is either impossible or has limited application in conserving specific genotypes. Cryopreservation of apices or embryos represents the only current option for long-term conservation of genetic resources of these problem species. Achieving sufficient desiccation of explants is of critical importance in cryopreservation protocols.

As regards recalcitrant seed research, IPGRI is coordinating an international project aimed at improving handling and storage conditions of tropical forest tree species with recalcitrant and intermediate behaviour. IPGRI is also participating in the development and application of cryopreservation protocols for numerous recalcitrant seed and vegetatively propagated species.

IPGRI has recently initiated the publication of Technical Bulletins which aim at transforming research outputs, especially developed technologies, into practical guidelines and suggestions for dissemination to scientists and technicians managing germplasm collections, with the objective of encouraging research under locally prevailing conditions. This publication series will maintain a focus on technical options, new or alternative techniques, methods and procedures appropriate for plant genetic resources programmes, particularly for those which operate under resource constraints.

Significant advances have been made in the understanding of desiccation sensitivity and tolerance mechanisms, as attested by the papers included in this Special Issue. However, research activities in this area are mainly performed within an academic framework, with limited links to scientists in genetic resources conservation programmes, who have to translate research results into practical applications. IPGRI intends to distribute this Special Issue to national

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programmes worldwide, to make the user community more aware of the progress achieved in this area. It is our hope that this will stimulate and strengthen collaboration between the academic and applied research communities, thus contributing to the improved conservation of plant genetic resources.

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