



Plant Genetic Resources Conservation and Management: Principles, Practices and Challenges

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About the Book

Plant Genetic Resources Conservation and Management provides, in-depth description of principles and practices of the techniques of both ex situ conservation strategy (seed and field genebanks, *in vitro*, DNA and pollen storage), and *in situ* conservation strategy (on-farm and nature reserves) for plant genetic resources (PGR), and current status of their applications. The book covers all aspects of plant germplasm conservation and management including plant domestication and crop evolution, history of conservation, exploration, exchange, quarantine, conservation techniques, characterization and evaluation, information management, intellectual property rights and conservation under climate change. In the area of management of plant germplasm, the book has focused on topics such as sampling techniques during collecting, strategies for enhancing exchange, biosafety and regulation of genetically modified (GM) crops, role of evaluation, core collection and pre-breeding in germplasm utilization. Additionally, it focuses on intellectual property rights (IPRs) and various international treaties on plant germplasm which have made access to genetic resources, a debated topic. It also includes the challenges of conservation in the event of climate change and their potential solutions. The content of the book provides comprehensive knowledge about plant germplasm conservation and management to help understand the basic principles, practices and future challenges involved. With its coverage and specific focused topics, it will be useful to researchers, conservationists, teachers, as well as students who are involved or interested in PGR conservation and management.

Salient Features

Provides methodologies, status and challenges of application of the techniques of *ex-situ* conservation (seed, field, *in vitro* & DNA genebanks) and of *in-situ* conservation (on-farm & nature reserves) of plant genetic resources.
 Focuses on topics of germplasm management like sampling during collecting, enhancing exchange, genetically modified crops in quarantine, core collection in management, evaluation and utilization.
 Deals with intellectual property rights, access to plant genetic resources, and challenges and potential strategies for germplasm conservation under climate change.

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About the Author

Binay B. Mandal :- served as a Professor of Plant Genetic Resources Division at the Indian Agricultural Research Institute (IARI), New Delhi and, a Principal Scientist at the National Bureau of Plant Genetic Resources (NBPGR), New Delhi. He did his graduation and post- graduation from Calcutta and Kalyani University, West Bengal and was recipient of University Merit Scholarship. He obtained his Ph.D. from IARI, New Delhi and did Post-Doctoral Research with Prof. T.A. Thorpe at the University of Calgary, Canada. He also did short-term advanced research on plant cryopreservation with Dr. Erica E. Benson at the University of Abertay, Dundee, Scotland. Dr. Mandal served as scientist (Genetics) at CRRRI, Cuttack and developed selected breeding lines in rice through hybridization of inter- geographic races (*indica* × *japonica*). He treated developing embryos of rice, instead of commonly used matured seeds, with chemical mutagen which resulted in two- fold increase in mutation frequency. Dr. Mandal's major research work, for over 20 years as Principal Scientist at NBPGR, was on conservation of Plant Genetic Resources (PGR) using in vitro and cryopreservation techniques. His ground-breaking research work leading to development of the first cryopreservation protocol for yams (*Dioscorea* spp.), is considered one of the early significant contributions in plant cryopreservation. Subsequently, he has made some of the most exhaustive cryopreservation studies on both edible and medicinal species of yams. Dr. Mandal served as Professor in the Division of PGR for 10 years and was involved in teaching and guiding Ph.D. and M.Sc. students. He published research articles including contributory, review articles and book chapters on aspects mostly related to conservation of plant germplasm. He has two books on conservation of PGR to his credit.