

1. Record Nr.	UNINA9910962936203321
Titolo	Agricultural crop issues and policies // Committee on Managing Global Genetic Resources: Agricultural Imperatives, Board on Agriculture, National Research Council
Pubbl/distr/stampa	Washington, D.C., : National Academy Press, 1993
ISBN	9786610203994 9781280203992 1280203994 9780309598262 0309598265 9780585025346 0585025347
Edizione	[1st ed.]
Descrizione fisica	1 online resource (475 pages) : illustrations
Collana	Managing global genetic resources
Disciplina	333.95/316
Soggetti	Crops - Germplasm resources - Management Germplasm resources, Plant - Management
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references (p. 381-406) and index.
Nota di contenuto	MANAGING GLOBAL GENETIC RESOURCES -- Copyright -- Preface -- Acknowledgements -- Contents -- Executive Summary -- AN AGRICULTURAL ENDOWMENT -- THE NEED FOR GENETIC RESOURCES -- ACCESSING GENETIC RESOURCES -- The Role of Science and Technology -- In Situ or Ex Situ Conservation? -- Managing the Numbers -- Describing Collections -- Regeneration: Essential but Overlooked -- The Role of Biotechnology -- Exchange and Ownership -- Quarantine -- Ownership -- BUILDING COOPERATION -- National Programs -- International Cooperation -- LOOKING TO THE FUTURE: RECOMMENDATIONS -- Managing Crop Vulnerability -- Management and Use -- Technology Development and Research -- Policy and Politics -- Institutions -- Multilevel Collaborations on Genetic Conservation -- An Overview of Genetic Resources Management -- THE IMPORTANCE OF GERMPLASM -- THE ORIGINS OF CONSERVATION -- THE USEFULNESS OF GERMPLASM -- THE THREAT OF GENETIC

VULNERABILITY -- EMERGENCE OF GLOBAL CONCERNS -- DISSENTING VIEWS -- THE PROBLEM OF ECONOMIC ANALYSIS -- MICROORGANISM COLLECTIONS -- PART I BASIC SCIENCE ISSUES -- 1 Genetic Vulnerability and Crop Diversity -- WHAT IS GENETIC VULNERABILITY? -- Critical Factors and Assumptions -- The Role of Uniformity -- The Role of Monoculture -- The Role of Environment -- Measuring Genetic Vulnerability -- PLANT, PATHOGEN, PEST, AND ENVIRONMENTAL RELATIONSHIPS -- Evolutionary Nature of the Relationship -- Types of Relationships -- Evolution of Major Pathogens -- Minor Pathogen Enhancement -- Environmental Enhancement of Pathogen Effects -- Varieties Vulnerable in New Regions -- Varieties Vulnerable to Exotic Pathogens -- Agronomically Related Vulnerability -- Change in Vulnerability to Discounted Pests -- BREEDING STRATEGIES AND THEIR IMPACT ON GENETIC DIVERSITY -- Genetic Diversity in Primitive and Modern Varieties.

Germplasm Varietal Development and Vulnerability -- Gains in Productivity -- Vulnerability and Varietal Replacement Over Time -- Alternative Strategies to Enhance Diversity and Increase Stability -- VULNERABILITY AND CROP DIVERSITY SINCE 1970 -- Dry Beans -- Wheat -- Maize -- Rice -- Minor Crops -- Genetic Vulnerability Today -- RECOMMENDATIONS -- 2 Crop Diversity: Institutional Responses -- GERmplasm COLLECTION AND CONSERVATION WORLDWIDE -- Role of IBPGR in Catalyzing Collection and Conservation -- Germplasm Banks Worldwide -- Evaluation -- IBPGR Interactions with the IARCs -- Interactions with National Programs -- Roles of Other International Agencies -- DEVELOPMENT OF INTERNATIONAL CROP BREEDING PROGRAMS -- Progress with Legumes, Root Crops, and Vegetables -- Nurseries and the Enhancement of Exotic Germplasm -- Networks and Interactions with National Programs -- Concerns -- GLOBAL IMPACT OF ACTIVITIES IN THE UNITED STATES -- Changes in the U.S. National Plant Germplasm System -- Impact of Plant Varietal Protection and Patents -- Genetic Diversity and Germplasm Exchange -- International Impact -- Changing Public and Private Sector Roles -- The Decline of Public Sector Breeding Programs -- The Growth of Private Sector Breeding Programs -- Restructuring of the Seed Industry -- Balancing Public and Private Sector Roles -- International Implications --

RECOMMENDATIONS -- 3 In Situ Conservation of Genetic Resources -- THE IMPORTANCE OF IN SITU CONSERVATION -- WILD SPECIES AS GENETIC RESOURCES -- Genetic Conservation Areas -- THE STATUS OF IN SITU CONSERVATION OF WILD TYPES -- Obstacles to In Situ Conservation of Wild Genetic Resources -- The Potential of Using Existing Protected Areas as Germplasm Banks -- THE STATUS OF IN SITU CONSERVATION OF DOMESTICATED TYPES -- RECOMMENDATIONS -- 4 The Science of Collecting Genetic Resources -- TYPES OF COLLECTIONS.

Base Collections -- Back-Up Collections -- Active Collections -- Breeders' Collections -- SAMPLING STRATEGIES -- PARAMETERS OF GENETIC DIVERSITY -- Neutral Allele Model -- EMPIRICAL STUDIES OF GENETIC DIVERSITY: NUMBERS OF ALLELES AND ALLELIC PROFILES -- Quantitative Characters -- Qualitative or Discretely Inherited Characters -- Enzyme Variants -- FORMULATION OF SAMPLING STRATEGIES -- EMPIRICAL STUDIES OF ALLELIC DIVERSITY AND ENVIRONMENTALLY INFLUENCED GENETIC DIFFERENTIATION -- A Wild, Predominantly Self-Pollinating Species -- Isozyme Variation Within and Among Cultivated Races of Maize, An Outbreeding Species -- SAMPLE SIZES FOR EACH COLLECTION SITE -- Capturing Lower-Frequency Alleles -- Size of the Sample -- NUMBER OF SITES TO SAMPLE -- RECOMMENDATIONS -- 5 The Science of Managing Genetic Resources -- SEED REGENERATION --

Breeding Systems -- Principles Involved in Maintaining Genetic Integrity During Regeneration -- Contamination from Outcrossing -- Differential Survival -- Isolation -- Population Size in Relation to Inbreeding Depression and Drift -- Maintaining Effective Population Sizes -- The Effect of Genetic Drift and Natural Selection -- Regeneration of Predominantly Inbreeding Species -- Maintenance of Landraces or Wild Species -- CHARACTERIZATION -- EVALUATION -- Increase of Seed or Plant Parts -- Multidisciplinary Approach to Evaluation -- Planning and Implementing Evaluation Tests -- Choice of Representative Environments or Sites -- Preventing Exotic Germplasm from Becoming a Serious Pest -- Verification of Evaluation Data -- Communication Among Plant Germplasm Users -- Documentation -- MONITORING OF SEED VIABILITY AND GENETIC INTEGRITY DURING STORAGE -- REDUNDANCY AMONG COLLECTIONS -- Core Subsets of Collections -- Advantages of Core Subsets -- Disadvantages of the Core Concept -- Practical Problems with Core Subsets. RECOMMENDATIONS -- 6 Using Genetic Resources -- AN EXAMPLE OF GERmplasm USE -- BREEDERS' PERCEPTIONS AND PRACTICES -- Monitoring Advanced Materials -- Performance Advances -- USERS' PERCEPTIONS OF THE GERmplasm SYSTEM -- BREEDERS' PERCEPTIONS OF ACTIVE COLLECTIONS -- Passport and Descriptor Information -- Maintenance, Rejuvenation, and Sample Size -- Redundancy -- Obsolescence -- Evaluation -- MODERNIZATION OF ACTIVE COLLECTIONS -- EVOLUTIONARY PROCESSES AND GERmplasm USE -- Barley -- Maize -- RECOMMENDATIONS -- 7 Biotechnology and Germplasm Conservation -- ALTERNATIVES TO STORING SEEDS AND WHOLE ORGANISMS -- In Vitro Conservation of Plants -- In Vitro Storage -- Collecting Germplasm In Vitro -- In Vitro Exchange of Germplasm -- In Vitro Conservation of Animals -- MOLECULAR CONSERVATION TECHNOLOGIES -- DNA as a Genetic Resource -- DNA Sequence Data Banks -- Restriction Fragment length Polymorphisms -- Polymerase Chain Reaction -- Randomly Amplified Polymorphic DNA Markers -- Other Uses for Probes -- RECOMMENDATIONS -- 8 Documentation of Genetic Resources -- INFORMATION ON GERmplasm COLLECTIONS -- Management Information -- Descriptive Information -- Sources of Additional Information -- Information on Other Collections -- Information on Related Topics -- Standardization of Information -- COMPUTERIZATION OF GERmplasm COLLECTION DATA -- Hardware -- Software -- Standardization of Systems -- Information Supply to Users -- CURRENT STATUS OF GENETIC RESOURCES DOCUMENTATION -- Collection Data Bases -- Central Crop Data Bases -- Other Sources of Information -- FUTURE DEVELOPMENTS -- RECOMMENDATIONS -- 9 The Conservation of Genetic Stock Collections -- IMPORTANCE AND USE OF GENETIC STOCK COLLECTIONS -- GENETIC STOCK COLLECTIONS -- Development and Location -- Development of Genetic Stock Collections -- Maintaining Genetic Stock Collections. Components of Collections -- Single-Gene or Single-Trait Variants -- Cytogenetic Stock -- Other Genetic Stocks -- Breeding Lines Versus Genetic Stock Collections -- MAINTAINING GENETIC STOCK COLLECTIONS OF AGRICULTURAL CROPS -- Special Needs and Requirements -- EXAMPLES OF GENETIC STOCK COLLECTIONS -- The Charles M. Rick Tomato Genetics Resource Center -- Operations of the TGSC -- Future Operations -- Barley Genetic Stock Collections -- The Barley Genetic and Aneuploid Stock Collection -- Operations of the Barley Genetic and Aneuploid Stock Collection -- Future Operations -- TOWARD A MORE SECURE FUTURE -- RECOMMENDATIONS -- 10 The Genetic Resources of Microorganisms -- ORGANIZATION OF MICROBIAL

CULTURE COLLECTIONS -- MICROBIAL RESOURCES IN CULTURE COLLECTIONS -- CONSERVING MICROBIAL DIVERSITY -- Numbers and Richness of Microbial Species -- MAINTENANCE OF GENETIC STABILITY IN CULTURE -- Traditional Preservation Methods -- Freeze-Drying and Liquid Nitrogen Preservation -- MAINTENANCE IN NATURAL HABITATS -- POTENTIAL OF MICROBES IN THE AGRICULTURAL, BIOTECHNOLOGICAL, AND INDUSTRIAL SECTORS -- Exploitation of Metabolites -- Genetic Engineering -- Application of Microorganisms in Agriculture -- RECOMMENDATIONS -- Part II POLICY ISSUES -- 11 Exchange of Genetic Resources: Quarantine -- REDUCING THE RISKS FROM PESTS AND PATHOGENS -- QUARANTINE AND GLOBAL TRANSFER OF PLANT GENETIC RESOURCES -- Quarantine as a Pest Control Strategy -- Quarantine and Genetic Resources -- Legal Basis of Quarantine -- Biologic Basis of Quarantine -- Geographic Basis of Quarantine -- Pests and Pathogens of Quarantine Significance -- Pathways for the Entry of Pests and Pathogens -- Pest Risk Analysis -- IMPORTATION OF GENETIC RESOURCES -- RECOMMENDATIONS -- 12 Exchange of Genetic Resources: Proprietary Rights -- PROPRIETARY RIGHTS ON LIVING BEINGS -- Plants -- Animals -- Microbes. Related Rights.

---

Sommario/riassunto

This anchor volume to the series Managing Global Genetic Resources examines the structure that underlies efforts to preserve genetic material, including the worldwide network of genetic collections; the role of biotechnology; and a host of issues that surround management and use. Among the topics explored are "in situ" versus "ex situ" conservation, management of very large collections of genetic material, problems of quarantine, the controversy over ownership or copyright of genetic material, and more.

---