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Stress Tolerance -- Chapter 9: Non-Thermal Plasma Technology: A Sustainable Solution for Agriculture -- Chapter 10:Application of Magnetic Resonance Imaging for Evaluation of Germination, Moisture Content and Seed Viability -- Chapter 11:Next-Gen Seeds: Harnessing Genetic Engineering for Improving Seed Quality Traits -- Chapter 12: Genetic Modifications and Gene Delivery using Nano-biotechnology for Improving Yield and Stress Tolerance -- Chapter 13:Molecular Markers and DNA Fingerprinting for Seed Traceability and Quality Control in Forest Genetic Resources -- Chapter 14:Application of Genetic Engineering, Marker assisted Breeding Programs for Improving Seed Quality Traits -- Chapter 15:Biotechnological Strategies for Seed Germplasm Maintenance and Plant Genetic Resource Conservation -- Chapter 16:Advanced Biotechnological Approaches for Seed Germplasm Conservation and Forest Genetic Resource Preservation -- Chapter 17: Synthetic Seeds: Innovation in Plant Propagation and Conservation for Sustainable Agriculture -- Chapter 18:Revolutionizing Tree Propagation by Exploiting the Power of Synthetic Seed Technology -- Chapter 19:Field Genebank: An efficient method for Conservation and Sustainable Utilization of Seeds -- Chapter 20:Enhancing Seed Quality and Predictive Accuracy in Indian Agriculture: Case Study at RARS, Kottayam, Kerala.

Sommario/riassunto

This book discusses various aspects of Seed Science and Technology including seed production, seed certification, seed quality enhancements, seed testing and harvesting, and post-harvest management. Continued efforts are being made to preserve plant genetic resources over long term in order to conserve biodiversity and provide food security. Seed and germplasm repositories hold high importance in this regard. Various technologies such as cryopreservation is being commonly employed to preserve seeds and plant tissues at extremely low temperatures. This book discusses the advancements of data storage and information management systems that have aided in the creation of extensive seed databases, and thus enabling researchers to quickly catalogue and access data on seed kinds, properties and availability. This book also explains the sophisticated technologies such as nanobiotechnology, machine learning, artificial intelligence, magnetic resonance and multispectral imaging which are currently being used for examining seed quality, genetic analysis, seed preservation and seed handling operations. The scope of these technologies in increasing the effectiveness and precision of seed research, developing better crop varieties and promoting sustainable environmental preservation has also been covered. This book is a reference source for Scientists, researchers and authorities involved in the production and certification of seeds. It is also valuable for seed experts working in the public and commercial sectors globally.