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Molecular and Physiological Insights into Plant Stress Tolerance and Applications in Agriculture is an edited volume that presents research on plant stress responses at both molecular and physiological levels. Key Features: - Emphasizes the morphological and physiological reactions of plants and the underlying molecular mechanisms when faced with stress from environmental or pathogenic factors. - Explores microbial dynamics within the plant rhizosphere and the application of plant growth-promoting bacteria as biofertilizers and endophytes as biocontrol agents to enhance crop growth and productivity for sustainable agriculture. - Systematically summarizes molecular mechanisms in plant stress tolerance and discusses the current applications of biotechnology, nanotechnology, and precision breeding to obtain stress-tolerant crops, contributing to climate-smart agriculture and global food security. - Includes contributions and references from multidisciplinary experts in plant stress physiology, plant molecular biology, plant biotechnology, agronomy, agriculture, nanotechnology, and environmental science. The content of the book is aimed at addressing UN SDG goals 2, 12, and 15 to achieve zero hunger and responsible consumption and production, and to sustainable use of terrestrial ecosystems, respectively. This comprehensive resource is suitable for researchers, students, teachers, agriculturists, and readers in plant science, and allied disciplines. Readership: Researchers, students, teachers, agriculturists, and readers in plant science, and allied disciplines.