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Nota di contenuto	1. Introduction: Impact of Nanotechnology on Plant Cell Biology -- Part I Cellular Mechanisms -- 2. Effect of Nanomaterials on Water and Solutes Translocation in Plants -- 3. Response of Plant Photosynthesis to Nanomaterials -- 4. Impact of Nanomaterials on Chlorophyll Content in Plants -- 5. Interactions of Nanomaterials with Plant Pigments -- 6. Impact of Nanomaterials on Plant Secondary Metabolism -- 7. Toxic Effects of Nanomaterials on Plant Cellular Mechanisms -- Part II Cellular Macromolecules -- 8. Interaction of Nanoparticles with Plant Macromolecules: Carbohydrates and Lipids -- 9. Interaction of Nanomaterials with Plant Macromolecules: Nucleic Acid, Proteins and Hormones -- 10. Influence of Nanomaterials on Non-Enzymatic Antioxidant Defense Activities in Plants -- 11. 2D-Nanosheets Based Hybrid Nanomaterials Interaction with Plants -- Part III Agricultural Implications -- 12. Nanomaterial Impact on Plant Morphology, Physiology and Productivity -- 13. Role of Nanomaterials in Improving Crop Productivity -- 14. Role of Nanomaterials in Plant Cell and Tissue Culture -- 15. Role of Nanomaterials in Improving the Nutritional Value of Crops -- 16. Role of Nanomaterials in Improving Crop Tolerance to Abiotic Stress -- 17. Plant Mediation to Tolerate Cadmium Stress with Selenium and Nano-selenium -- 18. Synthesis and Applications of Cellulose Nanomaterials Derived from Agricultural Waste and Byproducts.

This book focuses on the recent progress of nanotechnology with emphasis on the interaction between nanoparticles and plants on the cellular level. It is devoted to understanding the pathways of nanomaterials entry into plant cell and their influence on cellular organelle processes and influence on crop yield. It consists of 16 chapters grouped in 3 parts: Part I Cellular mechanisms, Part II Cellular macromolecules, and Part III Implications of nanomaterials. Chapters present the plant response to nanomaterial applications including morphological, physiochemical, and anatomical changes and their effect on plant growth and productivity. The book discusses the mechanisms of absorbance and translocation of nanoparticles and their interaction with the plant cellular biochemical compounds and organelles. It presents the current perspective of nanomaterials influence on cellular processes which include photosynthesis, photorespiration and pigment synthesis and accumulation. In addition, it provides current understanding of the impact of nanomaterials on cellular macromolecules including carbohydrates, lipids, nucleic acids, proteins, hormones, and antioxidant defense activities. Collectively, these processes and biochemical compounds have implications on crop yield. Chapters are written by globally recognized scientists and subjected to a rigorous review process to ensure quality presentation and scientific precision. Chapter begins with an introduction that covers similar contexts and includes a detailed discussion of the topic accompanied by high-quality color images, diagrams, and relevant details and concludes with recommendations for future study directions. Chapter "Impact of Nanomaterials on Plant Secondary Metabolism" is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.
