1. Record Nr. UNINA9910830548503321 Plant ionomics: sensing, signaling and regulation / / edited by Vijay **Titolo** Pratap Singh and Manzer H. Siddiqui Pubbl/distr/stampa Hoboken, New Jersey:,: John Wiley & Sons, Inc.,, [2023] ©2023 **ISBN** 1-119-80304-7 1-119-80302-0 Descrizione fisica 1 online resource (273 pages) Disciplina 572.82 Soggetti Plant molecular biology Plants - Nutrition Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Cover -- Title Page -- Copyright Page -- Contents -- List of Contributors -- Preface -- Chapter 1 Regulation of Metabolites by

Nutrients in Plants -- Introduction -- Nitrogen (N) -- Phosphorus (P) --Potassium (K) -- Sulfur (S) -- Magnesium (Mg) -- Calcium (Ca) --Boron (B) -- Chlorine (CI) -- Copper (Cu) -- Iron (Fe) -- References --Chapter 2 Agricultural Production Relation with Nutrient Applications -- Introduction -- Soil as a Basic Element in Agriculture --Constituents and Ingredients of Soil -- Essential Nutrients in Agriculture Especially in Plants -- Beneficial/Valuable Nutrients --Issues Related to Plant Nutrition -- Fertilizers and Fertilization Strategies -- References -- Chapter 3 Role of Nutrients in the ROS Metabolism in Plants -- Introduction -- Oxidative Defense System --Reactive Oxygen Species (ROS) and Reactive Nitrogen Species (RNS) --ROS Generation and Functions in Plants -- RNS and ROS Signaling in Plants in Response to Environmental Stresses -- Antioxidant Compounds -- Antioxidant-Mediated RNS/ROS Regulation -- Role of Nutrients in ROS Metabolism Under Salinity -- Role of Nutrients in ROS Metabolism Under Drought -- Role of Nutrients in ROS Metabolism Under Heavy Metal Stress -- Role of Nutrients in ROS Metabolism Under Low- and High-Temperature Stress -- References --Chapter 4 Polyamines Metabolism and their Regulatory Mechanism in

Plant Development and in Abiotic Stress Tolerance -- Introduction -- Distribution, Biosynthesis, and Catabolism of Polyamines -- Role of Polyamines in Plant Development -- Polyamines as Biochemical Markers for Abiotic Stress Tolerance -- Crosstalk of Polyamines with Other Signaling Molecules -- Plant Growth Regulators -- Conclusion -- References -- Chapter 5 Mycorrhizal Symbiosis and Nutrients Uptake in Plants -- Introduction -- Mycorrhizal Association and Its Types.

Establishment of Arbuscular Mycorrhiza in Soil -- Root Modifications for Accumulation of Nutrients -- Nitrogen Uptake Mechanisms of Mycorrhizal Symbionts -- Phosphorus Accumulation Mechanisms of Mycorrhizal Fungus -- Potassium (K) and Sodium (Na) Uptake Mechanisms of Mycorrhizal Fungi -- Metabolism of Sulfur in Mycorrhizal Symbiosis -- Role of Mycorrhizal Lipid Metabolism in Nutrients Accumulation -- Mechanism of Micronutrients and Heavy Metal Uptake in Mycorrhizae -- Carbons-Based Triggering of Nutrients Accumulation in Mycorrhizal Symbiosis -- Conclusion -- References --Chapter 6 Nutrient Availability Regulates Root System Behavior --Introduction -- Nutrients Importance in Root Growth and Development -- Morpho-Physiological Responses of Plant Roots to Nutrients Availability -- Nano Nutrients and Root System Modifications --Management Strategies for Maximizing Root Systems -- Conclusions and Future Perspectives -- References -- Chapter 7 Potassium Transport Systems at the Plasma Membrane of Plant Cells. Tools for Improving Potassium Use Efficiency of Crops -- Potassium (K+) as a Macronutrient for Plants -- K+ Transport Systems -- Key Points for K+ Homeostasis and Transport Systems Involved -- General Mechanisms of Regulation -- Agriculture for the Future: K+ Use Efficiency and Stress Tolerance -- Biotechnological Approaches and Emerging Techniques for Crop Improvement -- References -- Chapter 8 Role of Nutrients in Modifications of Fruit Quality and Antioxidant Activity --Introduction -- Short Overview About Fruit Quality -- Main Role of Mineral Elements on Trees Growth, Development, and Fruit Quality --The Ionomic Analysis of Fruit Crops -- Requirements of Fruit Trees to Chemical Elements -- The Role of Elements in the Metabolism of Fruit Trees and in Improving Quality -- Conclusion and Future Prospects --References.

Chapter 9 Nutrients Use Efficiency in Plants -- Introduction -- Nutrient Use Efficiency (Concepts and Importance) -- Role of Nutrient-Efficient Plants for Improving Crop Yields -- Physiological Mechanisms in Plant Nutrient Use Efficiency -- Conclusion and Future Prospects --References -- Chapter 10 Nutrients Uptake and Transport in Plants: An Overview -- Introduction -- Routes from the Soil to the Stele -- Passive Transport -- Active Transport -- Radial Transport of Mineral Ions --Long Transport of Mineral Ions -- Conclusion and Future Prospects --References -- Chapter 11 Regulation of Phytohormonal Signaling by Nutrients in Plant -- Introduction -- Phytohormones: Structure, Sites of Biosynthesis, and its Effects -- Interaction between Nutrient Availability and Phytohormone Signaling -- Conclusions and Prospects -- References -- Chapter 12 Nutrients Regulation and Abiotic Stress Tolerance in Plants -- Introduction -- How Abiotic Stresses Affect Plants -- Plant's Response to Abiotic Stress -- Mineral Nutrients in the Alleviation of Abiotic Stress in Plants -- Plant Growth-Promoting Rhizobacteria (PGPR), Mineral Nutrients, and Abiotic Stress --Conclusion -- References -- Chapter 13 Nutrient Management and Stress Tolerance in Crops -- Introduction -- Implications of Abiotic Stress in Plants -- Role of Nutrients in Stress Tolerance -- Conclusion -- References -- Index -- EULA.