1. Record Nr. UNINA9910830964103321

Titolo	Genes for plant abiotic stress [[electronic resource] /] / editors, Matthew A. Jenks, Andrew J. Wood
Pubbl/distr/stampa	Ames, IA, : Wiley-Blackwell, 2009
ISBN	1-282-30344-9 9786612303449 0-8138-0938-X 0-8138-0906-1
Descrizione fisica	1 online resource (345 p.)
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Disciplina	631.5233 632.1
Soggetti	Crops - Effect of stress on Crop improvement Crops and climate Crops - Physiology Crops - Development
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Genes for Plant Abiotic Stress; Contents; Contributors; Preface; Section 1: Genetic Determinants of Plant Adaptation under Water Stress; 1: Genetic Determinants of Stomatal Function; Introduction; Arabidopsis as a Model System; How Do Stomates Sense Drought Stress?; Signaling Events inside Guard Cells in Response to Drought; Cell Signaling Mutants with Altered Stomatal Responses; Transcriptional Regulation in Stomatal Drought Response; Summary; References; 2: Pathways and Genetic Determinants for Cell Wall-Based Osmotic Stress Tolerance in the Arabidopsis thaliana Root System; Introduction Genes That Affect the Cell Wall and Plant Stress ToleranceGenes and Proteins in Cellulose Biosynthesis; Pathways Involved in N-glycosylation and N-glycan Modifications; Dolichol Biosynthesis; Sugar-nucleotide Biosynthesis; Assembly of Core Oligosaccharide; Oligosaccharyltransferase; Processing of Core Oligosaccharides in the

ER; Unfolded Protein Response and Osmotic Stress Signaling; N-glycan Re-glycosylation and ER-associated Protein Degradation; N-glycan Modification in the Golgi Apparatus; Ascorbate as an Interface between the N-glycosylation Pathway and Oxidative Stress Response
Biosynthesis of GPI AnchorMicrotubules; Conclusion; References; 3: Transcription and Signaling Factors in the Drought Response Regulatory Network; Introduction; Drought Stress Perception; Systems Biology Approaches; Transcriptomic Studies of Drought Stress; The DREB/CBF Regulon; ABA Signaling; Reactive Oxygen Signaling; Integration of Stress Regulatory Networks; Assembling the Known Pathways and Expanding Using Gene Expression Networks' Predicted Protein Interactions; Acknowledgments; References; Section 2: Genes for Crop Adaptation to Poor Soil
4: Genetic Determinants of Salinity Tolerance in Crop PlantsIntroduction; Salinity Tolerance; Conclusion; References; 5: Unraveling the Mechanisms Underlying Aluminum-dependent Root Growth Inhibition; Introduction; Mechanisms of Aluminum Toxicity; Aluminum Resistance Mechanisms; Aluminum Tolerance Mechanisms; Arabidopsis as a Model System for Aluminum Resistance, Tolerance, and Toxicity; Aluminum-sensitive Arabidopsis Mutants; The Role of ALS3 in Al Tolerance; ALS1 Encodes a Half-type ABC Transporter Required for Aluminum Tolerance
Other Arabidopsis Factors Required for Aluminum Resistance/ToleranceIdentification of Aluminum-tolerant Mutants in Arabidopsis; The Nature of the alt1 Mutations; Conclusions; References; 6: Genetic Determinants of Phosphate Use Effciency in Crops; Introduction; Why Improve Crop Nutrition and the Relationship with World Food Security?; Phosphorus and Crops: Phosphorus as an Essential Nutrient and Its Supply as a Key Component to Crop Yield; Phosphorus and Plant Metabolism: Regulatory and Structural Functions Phosphate Starvation: Adaptations to Phosphate Starvation and Current Knowledge about Phosphate Sensing and Signaling Networks during Phosphate Stress

Sommario/riassunto

Abiotic stresses caused by drought, salinity, toxic metals, temperature extremes, and nutrient poor soils are among the major constraints to plant growth and crop production worldwide. While crop breeding strategies to improve yields have progressed, a better understanding of the genetic and biological mechanisms underpinning stress adaptation is needed. Genes For Plant Abiotic Stress presents the latest research on recently examined genes and alleles and guides discussion of the genetic and physiological determinants that will be important for crop improvement in the future.