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Altri autori (Persone)	JenksMatthew A HasegawaPaul M
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Nota di contenuto	Plant Abiotic Stress; Contents; Contributors; Preface; 1 Eco-physiological adaptations to limited water environments; 1.1 Introduction; 1.2 Limited water environments; 1.2.1 Arid and semiarid regions of the world; 1.2.2 Plant strategies for water economy; 1.2.3 Ability to survive in water-limited environments; 1.2.4 Surviving water-deficit (drought) and severe; 1.3 Adaptation to limited water environments; 1.3.1 Evolution of land plants; 1.3.2 Tolerance to desiccation; 1.4 Refresher of the world - how to create more drought-tolerant; 2 Plant cuticle function as a barrier to water loss 2.1 Introduction2.2 Cuticle structure and composition; 2.3 Cuticle function as a barrier to plant water loss; 2.4 Genetics of cuticle permeability; 2.5 Conclusions; 3 Plant adaptive responses to salinity stress; 3.1 Salt stress effects on plant survival, growth and development; 3.1.1 NaCl causes both ionic and osmotic stresses; 3.1.2 Secondary effects of salt stress; 3.2 Plant genetic models for dissection of salt tolerance; 3.2.1 Arabidopsis thaliana as a model for glycophyte

responses to salt stress; 3.2.2 *Thellungiella halophila* (salt cress) - a halophyte molecular genetic model

3.3 Plant adaptations to NaCl stress

3.3.1 Intracellular ion homeostatic processes; 3.3.1.1 Na<sup>+</sup> influx and efflux across the plasma membrane; 3.3.1.2 Na<sup>+</sup> and Cl<sup>-</sup> compartmentalization into the vacuole; 3.3.1.3 K<sup>+</sup> / Na<sup>+</sup> selective accumulation; 3.3.2 Regulation of Na<sup>+</sup> homeostasis in roots and shoots; 3.3.3 Sensing and regulatory pathways that control ion homeostasis; 3.3.4 Osmotic homeostasis: compatible osmolytes; 3.3.5 Damage response and antioxidant protection; 3.4 Plant salt tolerance determinants identified by functional genetic approaches; 3.4.1 Effector genes; 3.4.1.1 Na<sup>+</sup> homeostasis; 3.4.1.2 Genes involved in osmotic homeostasis: synthesis of compatible solutes; 3.4.1.3 Genes involved in ROS scavenging; 3.4.1.4 Genes involved in protection of cell integrity; 3.4.2 Regulatory genes; 3.4.2.1 Kinases; 3.4.2.2 Transcription factors; 3.4.2.3 Other salt tolerance determinants; 3.5 Global analysis of transcriptional activation of salt-responsive genes; 4 The CBF cold-response pathway; 4.1 Introduction; 4.2 Arabidopsis CBF cold-response pathway; 4.2.1 Discovery and overview; 4.2.2 CBF proteins; 4.2.2.1 General properties; 4.2.2.2 Mechanism of action; 4.2.3 Function of the CBF cold-response pathway; 4.2.3.1 Cryoprotective proteins; 4.2.3.2 Regulatory proteins; 4.2.3.3 Biosynthetic proteins; 4.2.4 Regulation of CBF gene expression in response to low temperature; 4.2.4.1 DNA regulatory elements controlling CBF expression; 4.2.4.2 Proteins with positive roles in CBF expression; 4.2.4.3 Proteins with negative roles in CBF expression; 4.2.4.4 Other potential CBF regulatory proteins; 4.2.4.5 Light and circadian rhythms; 4.2.4.6 Role of calcium; 4.2.4.7 Role of ABA; 4.3 Conservation of the CBF cold-response pathway; 4.3.1 Brassica napus; 4.3.2 Tomato; 4.3.3 Rice

## Sommario/riassunto

Over the past decade, our understanding of plant adaptation to environmental stress has grown considerably. This book focuses on stress caused by the inanimate components of the environment associated with climatic, edaphic and physiographic factors that substantially limit plant growth and survival. Categorically these are abiotic stresses, which include drought, salinity, non-optimal temperatures and poor soil nutrition. Another stress, herbicides, is covered in this book to highlight how plants are impacted by abiotic stress originating from anthropogenic sources. The book also addresses th