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biosynthesis and accumulation; 1.6 Control of seed mass; 1.6.1 Genetic factors affecting seed mass; 1.6.2 Testa development and seed mass; 1.6.3 Endosperm development and seed mass; 1.6.4 Sugar transport and metabolism during seed development; 1.6.5 Metabolic control of seed development and size; 1.7 Perspective; References; 2 Seed coat development and dormancy; 2.1 Introduction; 2.2 Development and anatomy of the seed coat; 2.2.1 The seed envelopes
2.2.2 The Arabidopsis testa2.3 Role of the seed coat in seed dormancy and germination; 2.3.1 Constraints imposed by the seed coat; 2.3.2 Flavonoids in Arabidopsis seeds; 2.3.2.1 Main flavonoid end-products present in seeds; 2.3.2.2 Molecular genetics of flavonoid metabolism; 2.3.2.3 Effects of flavonoids on seed dormancy and germination; 2.3.3 Flavonoids in seed dormancy and germination of various species; 2.3.3.1 Solanaceae; 2.3.3.2 Water permeability of testae in Leguminosae and other species; 2.3.3.3 Flavonoids and other phenolics as direct and indirect germination inhibitors
2.3.3.4 Pre-harvest sprouting (PHS) in cereals2.3.3.5 Heteromorphism and physiological heterogeneity among seeds; 2.3.3.6 Interactions with endosperm; 2.4 Link between seed coat-imposed dormancy and longevity; 2.5 Concluding remarks; References; 3 Definitions and hypotheses of seed dormancy; 3.1 Introduction; 3.2 Classifications of dormancy; 3.2.1 Endogenous dormancy; 3.2.2 Exogenous dormancy; 3.3 Definitions of dormancy; 3.4 Primary dormancy; 3.4.1 Induction of primary dormancy; 3.4.1.1 Role of ABA in dormancy induction; 3.4.1.2 Developmental programs and dormancy induction
3.4.2 Release of primary dormancy3.4.2.1 After-ripening; 3.4.2.2 Regulation of dormancy in imbibed seeds; 3.5 Secondary dormancy; 3.6 Signaling in dormancy; 3.6.1 Stress signaling; 3.6.2 Signaling networks; 3.6.3 Environmental signals; 3.7 Challenges for the future; References; 4 Modeling of seed dormancy; 4.1 Introduction; 4.2 Types and phenology of seed dormancy; 4.3 Environmental control of dormancy; 4.3.1 Factors affecting dormancy levels of seed populations; 4.3.1.1 Temperature; 4.3.1.2 After-ripening; 4.3.1.3 Stratification; 4.3.2 Factors that stimulate germination
4.3.2.1 Fluctuating temperature

Sommario/riassunto

The formation, dispersal and germination of seeds are crucial stages in the life cycles of gymnosperm and angiosperm plants. The unique properties of seeds, particularly their tolerance to desiccation, their mobility, and their ability to schedule their germination to coincide with times when environmental conditions are favorable to their survival as seedlings, have no doubt contributed significantly to the success of seed-bearing plants. Humans are also dependent upon seeds, which constitute the majority of the world's staple foods (e.g., cereals and legumes). Seeds are an excellent system f