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Abiotic Stress of Crops

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Environmental factors represent critical constraints on agricultural productivity. Abiotic stresses, including drought, heat, freezing, and salinity, driven by climate change, significantly reduce agricultural crop yields. Consequently, plants have evolved a diverse array of defense mechanisms to mitigate these stresses. Investigating the core regulatory genes implicated in plant stress tolerance and deciphering their underlying molecular mechanism establishes a critical theoretical framework for breeding stress-resistant crops. Advances in high-throughput genomic technologies, coupled with the availability of high-quality reference genomes for a wide range of crops, has substantially accelerated the identification of stress-resistant genes. This Reprint presents twelve research articles that investigate the molecular mechanisms underlying crop stress adaptation, including detailed analyses of drought, heat, freezing, and salinity responses in key species such as wheat, rice, maize, soybean, tomato, zanthoxylum, and alfalfa. Collectively, these investigations offer valuable genetic resources and molecular insights to support molecular breeding and genome-wide selection strategies in agriculture.

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