



Special Issue Reprint

Omics Approaches for Crop Improvement

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The growing human population and climate change are imposing unprecedented challenges on the global food supply. Crop improvement demands enhancing agronomical essential traits such as yield, resistance, and nutritional value by pivoting direct and indirect genetically assisted approaches to cope with these pressures. The development of last-generation high-throughput screening technologies, known as omics, promises to speed up plant trait improvement. Large-scale techniques such as genomics, transcriptomics, proteomics, metabolomics, and phenomics have already retrieved large volumes of data, as never before, which merged through bioinformatics and machine learning approaches; they are helping us to understand the mechanisms behind crop features. Omics datasets are not only generated from the tissues of a single genotype but also permeate macro-scale interactions to deepen our knowledge of crop behavior across the microbial and environmental continua. However, despite these massive technological and computational developments, cohesive efforts to combine contrasting omics studies within common pathways and cellular networks of crop systems are in their infancy. Therefore, this reprint envisions offering updated views on multidimensional large-scale omics-based approaches by compiling studies that explore the uses of the omics paradigm and their integration through trans-disciplinary bioinformatics as tools to improve the qualitative and quantitative traits in crop species.



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