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Special Issue Reprint

Molecular Breeding and Germplasm Improvement of Rice

www.mdpi.com/books/reprint/10461

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ISBN 978-3-7258-3010-7 (Hardback)

ISBN 978-3-7258-3009-1 (PDF)

Rice is frequently subjected to various biotic stresses, such as diseases, pests, and weeds, as well as abiotic stresses, including extreme temperatures, drought, waterlogging, salinity, heavy metals, and nutrient deficiencies. These stressors negatively impact rice yield and quality to varying degrees, resulting in significant annual economic losses for the global rice industry. Consequently, developing rice varieties with enhanced adaptability remains necessary. The substantial advancements made over the past decade have broadened our understanding of rice responses to biotic and abiotic stresses. Consequently, the investigation of genes and haplotypes that have adapted to diverse environments provides valuable genetic resources for breeding additional resistant varieties.

This Special Issue aims to provide a comprehensive overview of advancements in the resistance of rice to biotic and abiotic stresses, covering recent research on molecular breeding and germplasm improvement. We believe that the articles and insights discussed here will provide readers with relevant knowledge of resistance resources with which to sustainably increase crop yields—a necessity for ensuring future food security. Combining modern biotechnology with traditional breeding methods, these studies offer actionable strategies for addressing stress-related challenges in rice production and supporting sustainable agriculture.



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