Special Issue

Fruit Tree Germplasm Innovation Driven by Molecular Breeding and Genomics

Message from the Guest Editors

Fruit crops are indispensable pillars of global food security. However, escalating multifaceted challenges—including climate change-induced environmental stressors, soil degradation, water resource constraints, and emerging pathogens—threaten the sustainability of fruit production systems. The genetic complexity of perennial crops (e.g., high heterozygosity, polyploidy, and extended juvenile phases) further complicates traditional breeding efforts. Addressing these systemic bottlenecks necessitates a paradigm shift toward molecular breeding integrated with genomic innovation, leveraging cutting-edge technologies to unlock the genetic potential of fruit germplasm. Recent breakthroughs in plant genomics, CRISPR-based gene editing platforms, and multi-omics approaches (genomics, transcriptomics, proteomics, and metabolomics) have revolutionized our capacity to dissect complex agronomic traits and accelerate precision breeding. This Special Issue aims to bridge the gap between fundamental research and practical applications, fostering interdisciplinary translational studies that address critical challenges in fruit crop improvement.

Guest Editors

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