

Special Issue

Endophytic Fungi and Beneficial Microbes for Sustainable Crop Resilience

Message from the Guest Editors

Global climate change, soil degradation, and excessive use of agrochemicals pose severe threats to crop productivity and food security, thereby creating an urgent need to explore eco-friendly strategies—such as harnessing endophytic fungi and beneficial microbes—to sustainably enhance crop resilience. This Special Issue aims to consolidate research on the role of these microorganisms in boosting crop resilience, with its scope covering microbial symbiosis mechanisms, stress tolerance (to drought, salinity, and pathogens), soil health improvement, and their applications in sustainable agriculture. Notably, the study of microbe-crop interactions dates back decades: early research focused on rhizobial nitrogen fixation and mycorrhizal nutrient uptake, and as sustainable agriculture gained global traction, the field has expanded to investigate the multifunctional roles of endophytic fungi in enhancing crop resilience. Current cutting-edge research includes deciphering microbial metabolic pathways that regulate crop stress responses, developing microbe-based biofertilizers and biopesticides, and applying omics technologies to unravel the complex microbe-crop-soil interactions.

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