Special Issue

Advances in Biochar and Carbon-Negative Technologies for Sustainable Soil Management and Enhanced Crop Productivity

Message from the Guest Editors

The global challenges of ensuring food security and combating climate change are driving the agricultural sector to seek sustainable, innovative solutions. Among the most promising of these is the application of carbon-negative technologies, particularly biochar, which offer the potential to enhance crop productivity while actively contributing to climate change mitigation:

- Investigating the synergistic effects of biochar and other organic and inorganic soil amendments (e.g., compost, manure, mineral fertilizers);
- Evaluating field-scale impacts on crop yield, quality, and resilience to biotic and abiotic stresses (e.g., drought, pests, disease);
- Assessing soil health indicators such as pH, organic matter content, and enzymatic activities in biochar-amended soils;
- Analyzing the long-term effects of repeated or high-rate biochar applications across different soil types and climatic zones.
- Life cycle assessments (LCAs) to evaluate the environmental footprint of biochar production and application;
- Economic analyses assessing the cost-effectiveness and scalability of biochar use in different farming contexts;

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