Special Issue

Biochar–Soil–Plant Interactions

Message from the Guest Editors

The relationship between plants and soil lies at the core of global food security, and biochar—produced through the pyrolysis of biomass—has emerged as a promising tool to strengthen this relationship. Its application has shown potential to improve nutrient and water retention, regulate microbial activity and biodiversity, stabilize soil organic carbon, and reduce the mobility and bioavailability of pollutants.

Despite these benefits, several uncertainties remain. The performance of biochar varies across different soil types, climates, and crop systems, while its long-term effects on soil health, plant physiology, and ecosystem services are not fully understood. Questions also persist regarding its role in carbon offsets and life cycle sustainability.

This Special Issue aims to provide a platform to advance knowledge in this area and to clarify biochar's potential and limitations in sustainable agricultural practices. We welcome studies ranging from mechanistic insights and field applications to modeling approaches and life cycle assessments, aiming to provide a comprehensive perspective on biochar's role in sustainable agriculture.

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Message from the Editor-in-Chief

Plants is an open access journal which provides an advanced forum for research findings in areas related to plant function, its physiology, biology, taxonomy, stresses, and its interactions with other organisms. It publishes original research articles, reviews, reports, conference proceedings (peer reviewed full articles) and communications. In original research papers, it is important that full experimental details are provided. We also encourage timely reviews and commentaries on topics of interest to the plant research community.

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