

## Special Issue

# Soil Carbon Decomposition and Management: Experimental Insights for Sustainable Agroecosystems

### Message from the Guest Editors

Managing agroecosystems sustainably requires understanding how soil organic carbon decomposes while nitrogen, phosphorus, and other nutrients cycle in tandem. Consequently, this Special Issue highlights experimental insights across a range of scales—from enzyme kinetics and microbial carbon use efficiency to field trials and long-term networks—that reveal mechanisms controlling stabilization, mineral association, and greenhouse gas fluxes. Contributions integrating isotopic tracers, spectroscopic imaging, and multi-omics with process-based models are especially welcome. We seek studies that test management strategies such as cover crops, reduced tillage, organic amendments, biochar, precision fertilization, and diversified rotation, quantifying trade-offs among soil carbon gains, nutrient use efficiency, yields, and environmental outcomes. By synthesizing mechanistic experiments and model-data fusion, the Special Issue aims to define actionable pathways toward climate-smart, nutrient-efficient agroecosystems under intensifying climate variability.

### Guest Editors

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### Deadline for manuscript submissions

closed (15 May 2026)



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