

## Special Issue

# Soil Phosphorus Availability and Utilization: Interfacial Reactions, Chemical–Microbial Processes and Agronomic Management

### Message from the Guest Editors

Phosphorus (P) is an essential yet often limiting nutrient in agroecosystems, and its inefficient utilization has long constrained crop productivity while contributing to environmental risks. Over past decades, research on soil phosphorus has evolved from bulk chemical characterization toward a process-based understanding that integrates chemical speciation, microbial mediation, and interfacial reactions occurring at micro- to sub-millimeter scales. Recent advances highlight that P availability and utilization are governed by coupled chemical–microbial processes at key interfaces, including soil–mineral, soil–water, rhizosphere, and residue–soil interfaces. This Special Issue welcomes cutting-edge research employing innovative experimental approaches, such as high-resolution chemical imaging, isotopic tracing, molecular microbial tools, and process-based modeling, to unravel phosphorus dynamics across scales. Contributions addressing the impacts of fertilization regimes, organic amendments, crop–microbe interactions, and management practices on phosphorus efficiency are especially encouraged.

### Guest Editors

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