**Session Proposal**

# Session Title

Forest Soil Management: Processes, Challenges, and Sustainable Production

# Session Organizers

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# Session Description

Forest soils play a crucial role in sustaining ecosystem productivity and resilience through complex nutrient cycling processes. This session will explore key aspects of nutrient dynamics in forest soils, including decomposition, microbial interactions, nutrient loss, and the impacts of climate change and forest management practices. Researchers and practitioners will discuss the relationship between above ground growth and soil nutrient cycling, the role of mycorrhizal networks, and strategies for maintaining soil fertility under changing environmental conditions. By integrating perspectives from soil science, forestry, and ecology, this session aims to advance sustainable forest soil management and conservation strategies that support long-term ecosystem health.

# Relevance

This session aligns with the congress’s theme by addressing critical challenges in forest soil nutrient cycling, emphasizing its role in ecosystem sustainability, carbon storage, and biodiversity conservation. As primary forests are decreasing in productivity due to disturbance and climate impacts, more insight into soil resource productivity is needed. Planted forests are resource intensive and require intensive management. The session highlights innovative research and management approaches to optimize nutrient retention and enhance forest resilience in the face of environmental change.

# Format

The format of the proposed session will be oral presentations from globally recognized experts in the fields of soil nutrient cycling in forest. A pre-session survey will be emailed to global experts in this field. The survey will focus on identifying key challenges and knowledge gaps related to maintaining soil fertility, enhancing nutrient cycling, and mitigating the impacts of climate change and forest management practices on forest soils.

# Proposed Speakers

1. **Speaker 1: Xiaogang Li, Nanjing Forestry University.**

A leading expert in plant-microbe interactions and soil processes within forest ecosystems. A recipient of the Natural Science Foundation of China for Excellent Young Scholars and a key contributor to major national talent programs. His research focuses on microbial mechanisms underpinning soil fertility in plantations, tree-microbe interactions in challenging environments, and the sustainable cultivation of industrial resource trees. With over 100 publications in high-impact journals such as Science, Nature Communications, PNAS, ISME J, and Soil Biology & Biochemistry, he brings invaluable expertise on soil microbial dynamics and forest soil sustainability.

1. **Speaker 2: Junwei Luan, International Center for Bamboo and Rattan (ICBR).**

A renowned expert in forest ecosystem processes, particularly in belowground dynamics related to biodiversity loss, human disturbances, and climate change. He serves as Deputy Director of the Research Institute of Tropical Bamboo, Rattan, and Flower at ICBR. Before joining ICBR in 2016, he was a postdoctoral research fellow at Memorial University of Newfoundland, Canada. He has secured multiple research grants, including funding from the National Natural Science Foundation of China and the National Key Scientific Research Projects of China. An active contributor to the scientific community, he is an editorial board member for Forest Ecosystems and CABI Agriculture and Bioscience. With over 40 SCI papers in esteemed journals such as PNAS, Soil Biology and Biochemistry, Journal of Ecology, Agricultural and Forest Meteorology, Forest Ecology and Management, and Plant and Soil, his work provides significant insights into soil nutrient dynamics and forest soil sustainability

1. **Speaker 3: Qiaoling Yan, Institute of Applied Ecology, Chinese Academy of Sciences.**

A distinguished researcher in forest silviculture and ecosystem management. A recipient of the Natural Science Foundation of China for Excellent Young Scholars, she serves as Deputy Director of the Key Laboratory of Forest Ecology and Management and Deputy Station Director of the Qingyuan Forest Ecosystem Observation and Research Station. Her research is centered on sustainable forest management, nutrient cycling, and ecosystem resilience. With over 100 publications, including more than 50 SCI papers in top-tier journals such as Agricultural and Forest Meteorology, Forest Ecology and Management, and Plant and Soil, she provides critical insights into forest soil processes and their responses to environmental change.

1. **Speaker 4: Richard Bardgett,** **Lancaster Environment Centre, Lancaster University, Centre for Sustainable Soils.**

Professor Richard Bardgett is soil ecologist whose research explores how and why interactions between plants, their roots, and soil microbial communities regulate biogeochemical cycles and their response to climate change. He has bridged plant and soil ecology to gain a predictive understanding of how plant functional traits shape soil microbial communities and biogeochemical cycles from local to global scales, and how vegetation shifts in response to climate change impact biogeochemical cycles. A major focus of his recent research is ecological resilience, and understanding how below-ground communities and the biogeochemical cycles they regulate respond to and recover from climate extremes.

1. **Simard, Suzanne, Professor, Department of Forest and Conservation Sciences, University of British Columbia.**

Suzanne Simard is renowned for her groundbreaking research on forest ecosystems. She is best known for her discovery of the "wood wide web," a vast underground network of mycorrhizal fungi that connects trees and facilitates the exchange of nutrients, water, and chemical signals. Simard's work has revealed how trees communicate and cooperate, challenging traditional views of forest competition. Her research highlights the importance of biodiversity, tree kinship, and the resilience of forest soils, offering valuable insights for conservation and sustainable forestry practices.