**Session Proposal**

# Session Title

# Health Maintenance and Sustainable Management of Acidified Soils

# Session Organizers

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# Session Description

Soil acidification has emerged as a globally challenge, posing significant threats to agricultural productivity, ecosystem health, and sustainable land management. Acidified soils are typically characterized by declining pH, aluminum toxicity, and nutrient imbalances, leading to reduced crop yields, biodiversity loss, and land degradation. In recent years, global climate change and intensified anthropogenic activities have further highlighted the intimate relationships of soil acidification with environmental pollution, Carbon sequestration, and other critical issues. Consequently, the amelioration and sustainable utilization of acidified soils have become pivotal research frontiers in soil science.

This session will focus on the genesis, impacts, and remediation of soil acidification, with special emphasis on cutting-edge topics such as microbiome-based theories and technologies, interactions between soil acidification and contaminants, linkages between soil acidification and carbon neutrality.

Internationally renowned experts will share latest research advances and practical insights, covering diagnosis and monitoring of acidified soils, application of soil amendments (e.g., liming materials, organic amendments, and biochar), and evaluation of agricultural management practices (e.g., crop rotation, intercropping, and fertilization management).

The session will further explore the role of microbial communities in ameliorating acidified soils, including the regulation of microbial community structures, screening and application of functional microorganisms, and the potential of microbial-plant interactions in mitigating acidification stress.

In environmental and ecological contexts, the session will focus on the interactions between acidified soils and contaminants, including heavy metals, organic pollutants, and emerging contaminants like microplastics. Discussions will address how soil acidification influences contaminant migration, transformation, and associated ecological risks.

Additionally, the relationship between soil acidification and carbon neutrality will be thoroughly examined. Key topics include analyzing the impacts of acidified soils and their remediation on soil carbon sequestration and greenhouse gas emissions. Strategies to achieve carbon neutrality through soil management will be explored.

This session aims to foster international academic collaboration, drive innovation in acidified soil remediation technologies, and contribute to the sustainable utilization of global land resources. We warmly invite colleagues worldwide to participate and collectively advance solutions to this pressing global challenge.

# Relevance *(Explain how the session aligns with the overall theme of the congress and addresses key challenges or innovations in soil science, limited to 100 words total)*

This session is closely aligned with the theme of "Soil Chemical Degradation Control and Restoration" under the broader framework of "Soil Degradation Control, Remediation and Reclamation". Soil acidification represents a primary manifestation of soil degradation, making the amelioration and sustainable utilization of acidified soils a critical component of soil degradation control and restoration. The key challenges in this field include complex interactions in acidified soils, limitations of conventional amelioration techniques, interplay between soil acidification and global change, and regional variability and technological adaptability. The innovation emphasizes microbiome-driven remediation, novel soil amendments, intelligent soil management, carbon-neutral synergy through acid soil improvement, and regional specific technology application.

# Format *(Indicate whether the session will feature* *oral presentations, panel discussions, workshops, or any other interactive format)*

# Oral presentations, panel discussions, and workshops

# Proposed Speakers *(List potential speakers (if any) you intend to invite, including their affiliations and a brief description of their contributions to the session)*

Fangbai Li, Institute of Eco-environmental and Soil Sciences, Guangdong Academy of Sciences, Migration and transformation of heavy metals and biochar improvement in acidified soil, cefbli@soil.gd.cn

Jianming Xu, Zhejiang University, Microbial remediation and soil health regulation in acidified soil, jmxu@zju.edu.cn

Jin Chen, Jiangxi Academy of Agricultural Sciences, Red soil acidification and crop nutrient utilizati, chenjin2004777@163.com

Jinshui Wu, Institute of Subtropical Agriculture, Chinese Academy of Sciences，Fertility of red paddy soil, jswu@isa.ac.cn

Renfang Shen, Institute of Soil Science, Chinese Academy of Sciences, Mechanism of aluminum acid resistance in plants, rfshen@issas.ac.cn

Renkou Xu, Institute of Soil Science, Chinese Academy of Sciences, Soil acidification and improvement, rkxu@issas.ac.cn

Wenfeng Tan, Huazhong Agricultural University, Soil chemistry and environment, tanwf@mail.hzau.edu.cn，

Wenju Zhang, Institute of Agricultural Resources and Regional Planning CAAS, Soil acidification monitoring technology for cultivated land, zhangwenju01@caas.cn

Xiaojun Shi, Southwest University, Purple soil acidification remediation, shixj@swu.edu.cn

Ying Teng, Institute of Soil Science, Chinese Academy of Sciences, Bioremediation of acidified red soil pollution, yteng@issas.ac.cn

Yuji Jiang, Fujian Agriculture and Forestry University, Acidified soil biological networks, yjjiang@fafu.edu.cn

Yuting Liang, Institute of Soil Science, Chinese Academy of Sciences, Mechanisms and techniques of acidified soil microbiome remediation, ytliang@issas.ac.cn

Hans Lambers, University of Western Australia, Plant nutrition and plant ecology, hans.lambers@uwa.edu.au

Johan Six，Eidgenössische Technische Hochschule Zürich, Soil carbon cycling and sustainable management, johan.six@usys.ethz.ch

Kazumichi Fujii, Forestry and Forest Products Research Institute, Japan, Acid deposition impacts, fjkazumichi@gmail.com

Kazuyuki Inubushi, Tokyo University of Agriculture, Japan, Soil ecology under global change, inubushi@faculty.chiba-u.jp

Magalhães, Jurandir Vieira de, Brazilian Agricultural Research Corporation, Plant genetics and stress tolerance, jurandir@cnpms.embrapa.br

Pallavi Thimmappa, University of Agricultural Sciences, India, ​Soil silicon dynamics, pallavisac15@gmail.com

Peter R Ryan, CSIRO Agriculture and Food, Plant response to soil stress, Peter.Ryan@csiro.au

Prakash Nagabovanalli, University of Agricultural Sciences, India, Biochar, Mineral and waste utilization, nagabovanalliprakash@rediffmail.com

Rafiqul Islam, Bangladesh Agricultural University, Mitigation of greenhouse gas emissions, rafiqss69@bau.edu.bd

Rosazlin Abdullah, University of Malaya, Sustainable soil management and biochar applications, rosazlin@um.edu.my

Yakov Kuzyakov, University of Göttingen, Germany, Soil biogeochemistry, kuzyakov@gwdg.de

Zdenko Lončarić, Faculty of Agrobiotechnical Sciences, University of Osijek, Croatia, Sustainable agroecology, zdenko.loncaric@pfos.hr

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