**Session Proposal**

# Session Title

Survey-Based Soil Spectral Library for Agricultural Management

# Session Organizers

Jianping Qian, Chinese Academy of Agricultural Sciences, qianjianping@caas.cn, primary contact person

Eyal Ben-Dor, Tel Aviv University, bendor@tauex.tau.ac.il

Yijian Zeng, University of Twente in Enschede, y.zeng@utwente.nl

Zhou Shi, Zhejiang University, shizhou@zju.edu.cn

# Session Description

Soil spectral libraries (SSLs), built upon standardized soil surveys, are becoming central to modern soil science by enabling rapid, cost-effective, and scalable assessment of key soil properties. This session explores cutting-edge strategies to transform raw survey-based spectral measurements into robust, interoperable spectral libraries that support soil health diagnostics, agronomic management, and environmental assessment. Attendees will gain insights into recent advances in laboratory protocols, field-deployable sensors, chemometric modeling, and cross-institutional data harmonization driving the next generation of soil spectral infrastructure. Key topics include but are not limited to: (1) Protocol Standardization: Establishing unified soil sampling and spectral acquisition methods to minimize inter-survey and inter-lab variability and ensure spectral data consistency. (2) Spectral Modeling: Developing and validating models for accurate prediction of soil attributes such as organic carbon, pH, nutrient content, and contamination levels. (3) Agricultural Management: Using spectral libraries for rapid soil fertility assessment, nutrient recommendation systems, and field-scale variability analysis in support of precision agronomy. (4) Soil Degradation monitoring: Detecting and quantifying indicators of soil decline such as salinization, acidification, and nutrient depletion. (5) Global Data Integration: Building internationally compatible SSLs by aligning metadata standards, calibration transfer techniques, and data sharing mechanisms across institutions and national survey programs.

# Format

Oral presentations

# Proposed Speakers

Jianping Qian, Chinese Academy of Agricultural Sciences, qianjianping@caas.cn, primary contact person

Eyal Ben-Dor, Tel Aviv University, bendor@tauex.tau.ac.il : EBD is leading the P4005 Working Group under IEEE SA UBMELRA to standardize soil spectral measurements and was a founder of the soil spectral library concept 40 years ago.

Yijian Zeng, University of Twente in Enschede, y.zeng@utwente.nl

Zhou Shi, Zhejiang University, [shizhou@zju.edu.cn](mailto:shizhou@zju.edu.cn)

Nikolaos Tziolas,  University of Florida, [ntziolas@ufl.edu](mailto:ntziolas@ufl.edu) : NZ is a senior researcher at Florida University USA. He is a mathematician specializing in soil spectral analysis and recently has developed the federal analysis concept for utilizing soil spectral libraries from multiple sources while preserving copyrights and IP.