

Special Issue

Advancing Leaf Area Index (LAI) Measurement for Climate-Smart Agriculture: Field-Based and UAV-Driven Approaches

Message from the Guest Editors

Leaf area index (LAI) is a critical biophysical parameter that influences photosynthesis, evapotranspiration, and crop productivity. Accurate LAI measurement is essential for understanding plant health, modeling crop growth, and informing climate adaptation strategies. However, current methods vary widely in scale, precision, and accessibility. This Special Issue aims to bring together cutting-edge research on both in situ and UAV-based LAI measurement techniques. By integrating ground truth data with remote sensing and machine learning approaches, we seek to advance scalable, accurate, and cost-effective solutions for agricultural monitoring under changing climate conditions. The research objectives include the following: To develop and validate high-resolution LAI estimation methods using UAV multispectral and hyperspectral imagery; To assess the performance of deep learning models versus classical regression techniques for LAI prediction; To explore LAI dynamics under abiotic stress (drought, nutrient deficiency) and link them to crop resilience; To integrate LAI data into crop growth models for improved yield forecasting and climate adaptation strategies.

Guest Editors

Dr. Klára Pokovai

Department of Soil Physics and Water Management, Institute for Soil Sciences, HUN-REN Centre for Agricultural Research, 1116 Budapest, Hungary

Prof. Dr. Chengming Sun

Cultivation and Construction Site of National Key Laboratory for Crop Genetics and Physiology in Jiangsu Province, Yangzhou University, Yangzhou 225009, China

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Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
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Editor-in-Chief

Prof. Dr. Leslie A. Weston

Gulbali Centre for Agriculture, Water and Environment Research,
Charles Sturt University, Wagga Wagga, NSW 2678, Australia

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