

Special Issue

Advances in Imaging Technologies for Precision Agriculture

Message from the Guest Editors

Many imaging solutions struggle with scalability across diverse environments, standardization of data formats, and interoperability between platforms. Integrating multimodal imaging (e.g., combining hyperspectral with LiDAR or thermal data) is still in its early stages. In contrast, robust ground-truth datasets for training and validating AI-driven imaging systems are often limited. Potential contributions include, but are not limited to:

- Development of novel imaging hardware and sensor platforms tailored for crop monitoring.
- Integration of multisource imaging for comprehensive crop analysis.
- Imaging solutions for early disease, pest, and nutrient stress detection under field conditions.
- UAV- and satellite-based imaging frameworks for large-scale, high-throughput monitoring.
- AI-powered image processing, including generative AI, foundation models, and explainable deep learning for agricultural decision support.
- Imaging-based phenotyping pipelines for breeding programs and genotype–environment interaction studies.
- Advances in image-based robotics and automation for precision application of water, nutrients, and crop protection.

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Deadline for manuscript submissions

15 May 2026



Electronics

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Impact Factor 2.6
CiteScore 6.1



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