Keynote Speech – Oral Session II

New Tools in Plant Disease Assessments

Mathews Paret

Plant Pathology Department, and North Florida Research and Education Center, University of Florida

*Email - paret@ufl.edu

Abstract
The field of plant pathology is currently experiencing an array of fascinating transformations on a global scale, particularly in the realm of research, development, and commercialization of innovative tools for plant disease assessments. The utilization of spectral sensing technologies, such as multi-spectral and hyper-spectral sensing, is revolutionizing field scouting practices and enabling more accurate and timely assessments of disease severity and hotspots in agricultural fields. Machine learning and Artificial intelligence-based tools for image and object classification of plant diseases imagery at the microscopic and macroscopic level is opening up opportunities for field classification of plant diseases (and other biotic and abiotic issues) for farmers around the world including in remote places. This also have scope in improving triaging of plant samples coming to plant disease diagnostic labs in places where these facilities are available, and discovery of invasive diseases. Non-destructive testing techniques like Raman spectroscopy is increasingly being used for detecting changes in plants associated with plant diseases, and characterization of pathogens. Field-based detection of DNA/RNA targets of plant pathogenic viruses, bacteria and fungi by Recombinase Polymerase Amplification is increasingly becoming commercial. This is also focused on development for use by non-skilled personnel. This presentation will offer a comprehensive overview of the latest research findings conducted in our laboratory, as well as insights from other prominent research groups in the field. Our discussion will revolve around the transformative potential of these cutting-edge techniques for farmers worldwide. By highlighting the advancements in plant disease assessments, we aim to demonstrate how these new tools can revolutionize farming practices and contribute to improved crop health and yield. The practical applications and benefits of these techniques will be explored during the presentation, with emphasis placed on their relevance and impact in addressing the challenges faced by farmers on a global scale.

Keywords: Amplification, Artificial Intelligence, Machine Learning, Raman spectroscopy, Recombinase Polymerase, Sensing

References

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