March 23, 2018

STUDENT SEMINAR

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Title

Building hyperspectral reflectance based models for early late blight detection in potato

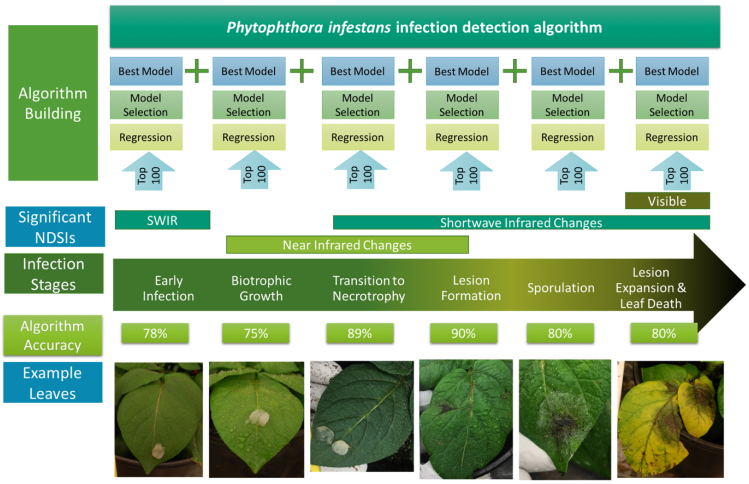
Speaker

Kaitlin M. Gold
(4th year PhD student in Department of Plant Pathology, UW-Madison)

Time & Place

Friday, March 23, 4pm, SMI 133

Snacks @ 3:45pm, SMI 133



Abstract

Late blight of tomato and potato caused by the oomycete pathogen *Phytophthora infestans* continues to be one of the most challenging diseases to sustainably and proactively manage. Advanced field-based methods of late blight detection that can identify infection before the onset of visual symptoms would improve management by greatly reducing disease potential and spread. The objective of this work was to explore the detection of late blight infection during its latent, or biotrophic phase, using reflectance spectroscopy. We conducted controlled experiments in growth chambers using inoculated and control, non-inoculated plants to test the ability of reflectance spectroscopy for non-visual detection of infection. We measured continuous visible to shortwave infrared reflectance (400-2500 nm) on leaves of the plants using a portable spectrometer with contact probe at 12-24hr intervals. Our results indicated that we could detect late blight infection, caused by clonal lineages US-23 and US-08, with 78% accuracy at just 24 hours post-inoculation, and upwards of 85% accuracy across all time points. Shortwave infrared wavelengths (>1300 nm) proved to be important for disease detection and typing the pathogen life stage. Late blight infection was accurately detected up to four days before visual symptoms appeared, indicating potential for using spectroscopy as a tool for rapid, early detection of late blight in real-time.