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Novel handheld microscope device for prediction of plant diseases

A handheld, in-field microscope system provides early, real-time, non-destructive detection and classification of plant diseases based on morphological features.

When plants become infected with pathogens, there are early markers to indicate disease development that appear on leaf surfaces like spots, discolorations, blobs, etc. These indicators show up early within the lifecycle of the pathogen, but it can be difficult to determine the identity of the pathogen by eye. Current computational methods to detect pathogens are built for smartphone image acquisition, which sometimes does not provide enough information for identification, or laboratory-based microscopy image acquisition, which can magnify the sample greatly for identification but usually requires the destruction of the leaf sample. Not to mention, depending on how long ago the leaf sample was taken from the plant and then sent to the lab, the leaf could no longer be representative of in-field conditions. To address these concerns, researchers at Purdue University have designed an in-field, handheld microscope and system for early plant disease detection with magnification capabilities and does not result in destruction of plant leaves.

Technology Validation:

-Technology can detect diseased areas on plant leaves and classify the disease based on morphological features for 4 field samples

Advantages

-Modular setup, so easy to exchange out parts like eyepiece, objective, or light source

-Real-time, in-field detection of plant diseases

-Early detection and very reliable

Applications

Technology ID
2025-JIN-70810

Category
Agriculture, Nutrition, & AgTech/Precision Agriculture & Smart Farming
Artificial Intelligence & Machine Learning/AI-Integrated Imaging Systems & Industrial Vision and Inspection
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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View online

-Detection of plant diseases in the field by farmers

TRL: 4

Intellectual Property:

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