

WAA 2018 Fall Conference

The Science (and Art) of Plant Disease Diagnosis

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Plant Disease Diagnosis “Easy Money Diseases”



Powdery Mildew



Golden Canker



Cedar-Apple Rust



Black Knot

Plant Disease Diagnosis “The Rest . . .”

Sample



Diagnosis

Plant Disease Diagnosis Plant Host

Colorado Blue Spruce

Cytospora
CankerSpruce
Needle DropRhizosphaera
Needle Cast

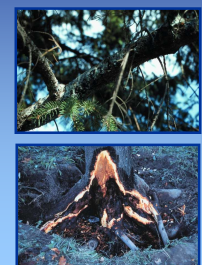
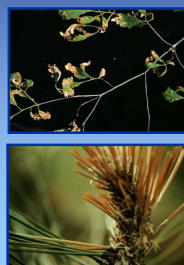
Plant Disease Diagnosis Plant Host

Varietal Differences



Plant Disease Diagnosis Symptoms

Necrotic Symptoms



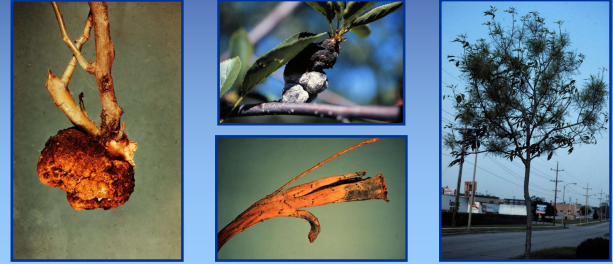
Plant Disease Diagnosis Symptoms

Discoloration Symptoms



Plant Disease Diagnosis Symptoms

Overgrowth Symptoms



Plant Disease Diagnosis Symptoms

Undergrowth Symptoms



Plant Disease Diagnosis Symptoms

Wilt Symptoms



Plant Disease Diagnosis Symptoms

Spatial Patterns



Plant Disease Diagnosis Symptoms

Temporal Patterns



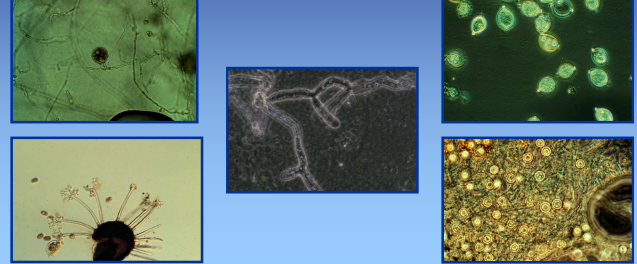
Plant Disease Diagnosis Pathogens

Macroscopic Examination



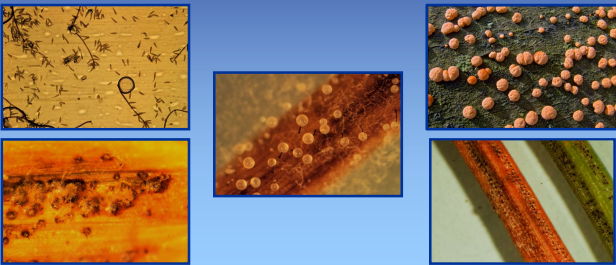
Plant Disease Diagnosis Pathogens

Microscopic Examination



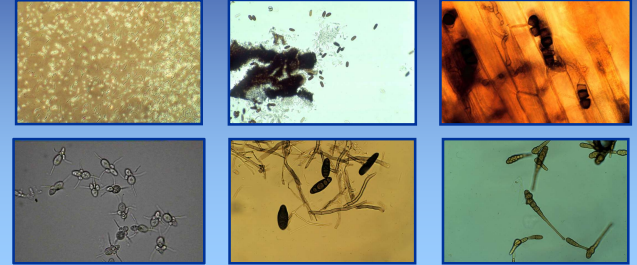
Plant Disease Diagnosis Pathogens

Microscopic Examination



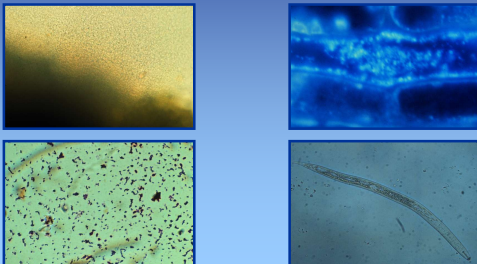
Plant Disease Diagnosis Pathogens

Microscopic Examination



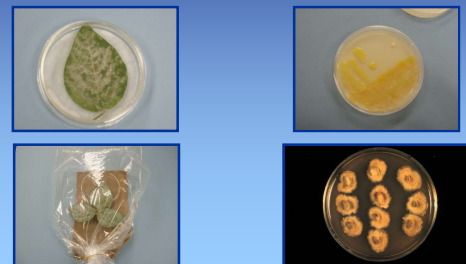
Plant Disease Diagnosis Pathogens

Microscopic Examination



Plant Disease Diagnosis Pathogens

Incubations and Isolations



Plant Disease Diagnosis Pathogens

Bioassays



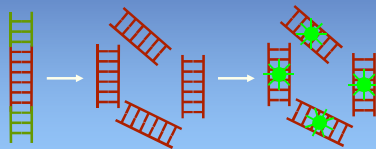
Plant Disease Diagnosis Pathogens

Serological Techniques



Plant Disease Diagnosis Pathogens

DNA-Based Techniques



Plant Disease Diagnosis Environmental Factors

- **Collect information on weather**
 - Rainfall vs. drought
 - Driving vs. gentle rain
 - Humidity
 - Hail
 - High winds
 - Hot vs. cold temperatures

Plant Disease Diagnosis Environmental Factors

- **Collect information on weather**
 - Winter conditions
 - Snow cover
 - Ice sheets
 - Freezing and thawing
 - Fall/winter transitions

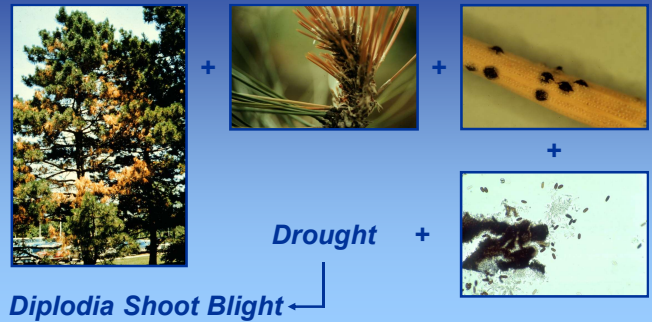
Plant Disease Diagnosis Environmental Factors

- **Collect information on soils**
 - Clay vs. sandy
 - Well vs. poorly drained
 - Flat vs. sloped
 - Fertility and pH

Plant Disease Diagnosis Environmental Factors

- Collect information on chemical sources
 - Fertilizer applications
 - Pesticide applications
 - Air pollutant point sources
 - Heating systems

Plant Disease Diagnosis Putting It All Together



Plant Disease Diagnosis Putting It All Together



Plant Disease Diagnosis New Diseases

Koch's Postulates

- Link a pathogen with symptoms on a given host
- Isolate the pathogen in pure culture
- Inoculate plants and reproduce symptoms
- Re-isolate the pathogen from inoculated plants



Plant Disease Diagnosis Abiotic Disorders



Chlorosis



Imprecis Injury



Salt Damage



Blossom End Rot

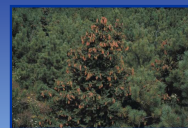


2,4-D Injury



Urine Damage

Plant Disease Diagnosis Abiotic Disorders



Cold Injury



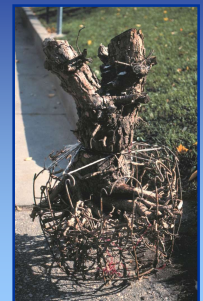
Drought Stress



Heat Injury



Winter Injury



Improper Planting

Plant Disease Diagnosis Non-Diseases



Maple Eyespot Gall



Stink Horns



Broad Mite Injury



Slime Mold

Plant Disease Diagnosis Where to Go for Help

*Plant Disease Diagnostics Clinic
Department of Plant Pathology
University of Wisconsin-Madison*

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