

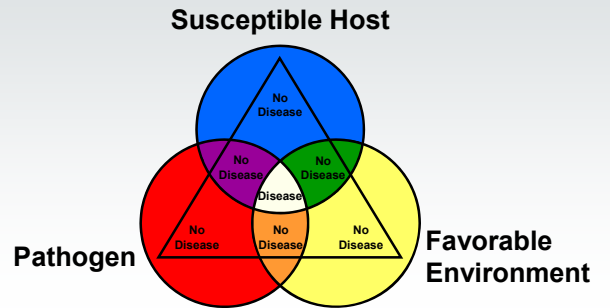
2023 PDDC Plant Disease Talks

The Science (and Art) of Plant Disease Diagnosis

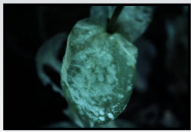
Brian D. Hudelson
 Department of Plant Pathology
 University of Wisconsin-Madison/Extension



Plant Disease Diagnosis
 The Disease Triangle



Plant Disease Diagnosis
 "Easy Money Diseases"



Powdery Mildew



Black Knot



Golden Canker



Tar Spot

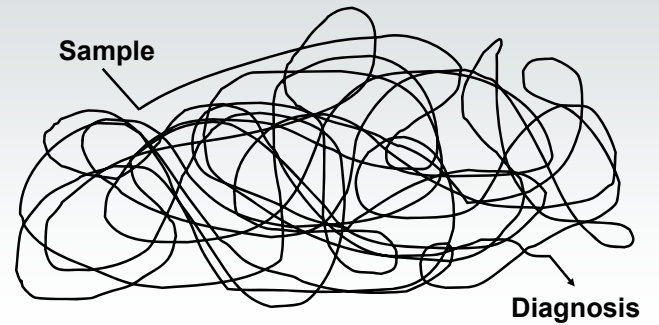


Elderberry Rust

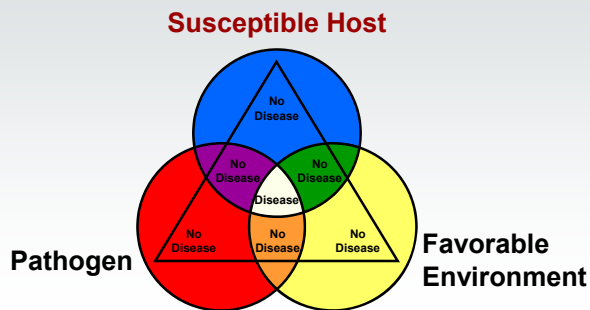


Cedar-Apple Rust

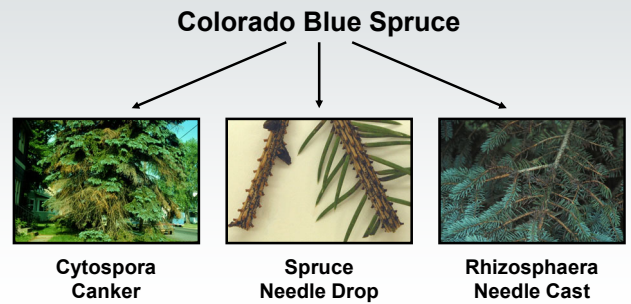
Plant Disease Diagnosis
 "The Rest ..."



Plant Disease Diagnosis
 The Disease Triangle



Plant Disease Diagnosis
 Susceptible Host

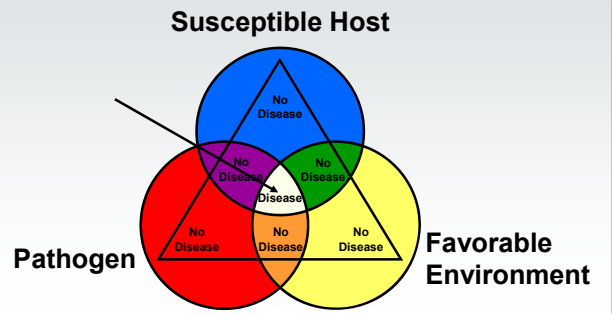


Plant Disease Diagnosis
Susceptible Host

Varietal Differences



Plant Disease Diagnosis
The Disease Triangle



Plant Disease Diagnosis
Symptoms

Necrotic Symptoms



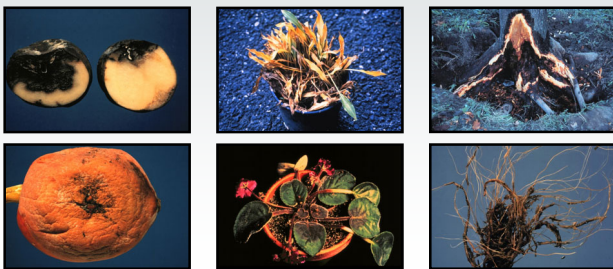
Plant Disease Diagnosis
Symptoms

Necrotic Symptoms



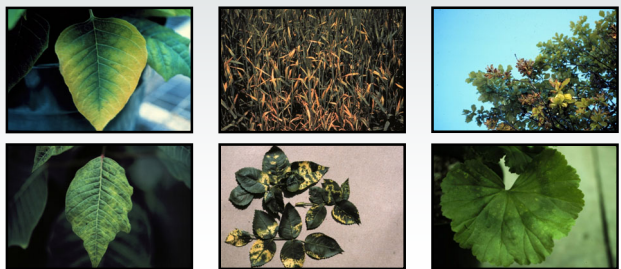
Plant Disease Diagnosis
Symptoms

Necrotic Symptoms



Plant Disease Diagnosis
Symptoms

Discolorations



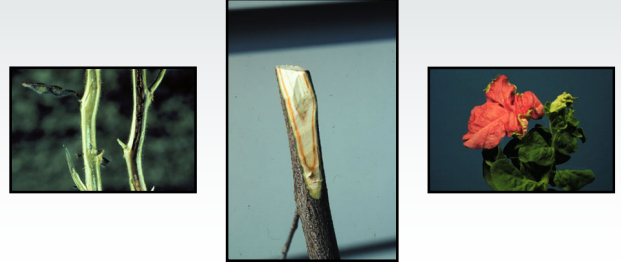
Plant Disease Diagnosis Symptoms

Discolorations



Plant Disease Diagnosis Symptoms

Discolorations



Plant Disease Diagnosis Symptoms

Overgrowth Symptoms



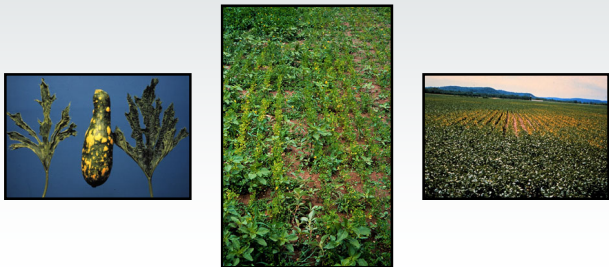
Plant Disease Diagnosis Symptoms

Overgrowth Symptoms



Plant Disease Diagnosis Symptoms

Undergrowth Symptoms



Plant Disease Diagnosis Symptoms

Wilt Symptoms



Plant Disease Diagnosis Symptoms

Spatial Patterns



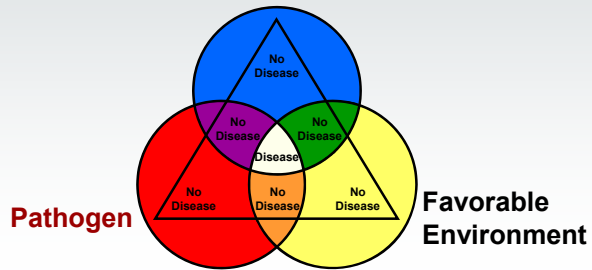
Plant Disease Diagnosis Symptoms

Temporal Patterns



Plant Disease Diagnosis The Disease Triangle

Susceptible Host



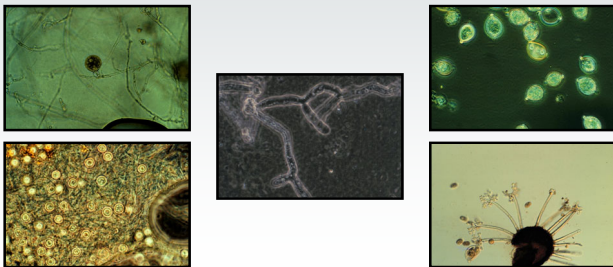
Plant Disease Diagnosis Pathogens

Macroscopic Examination



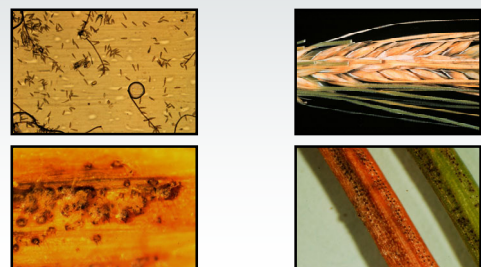
Plant Disease Diagnosis Pathogens

Microscopic Examination



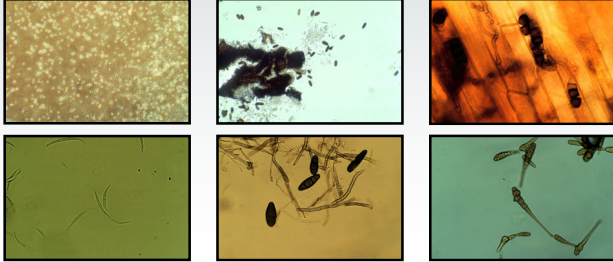
Plant Disease Diagnosis Pathogens

Microscopic Examination



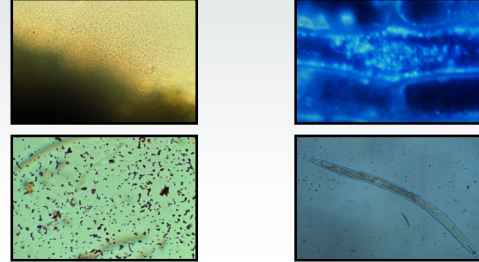
Plant Disease Diagnosis Pathogens

Microscopic Examination



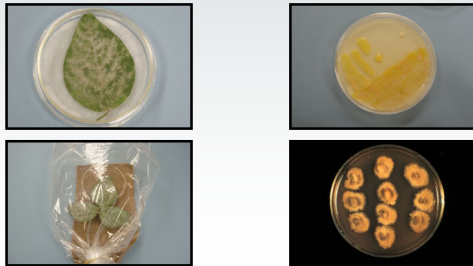
Plant Disease Diagnosis Pathogens

Microscopic Examination



Plant Disease Diagnosis Pathogens

Incubations and Isolations



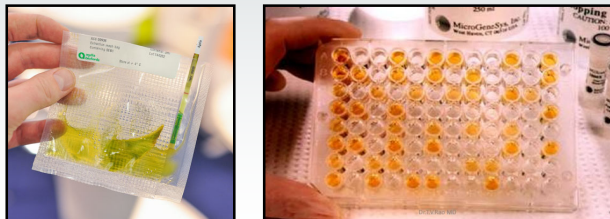
Plant Disease Diagnosis Pathogens

Bioassays



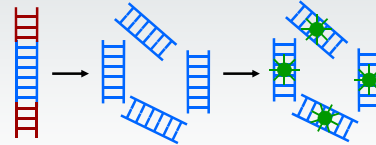
Plant Disease Diagnosis Pathogens

Serological Techniques



Plant Disease Diagnosis Pathogens

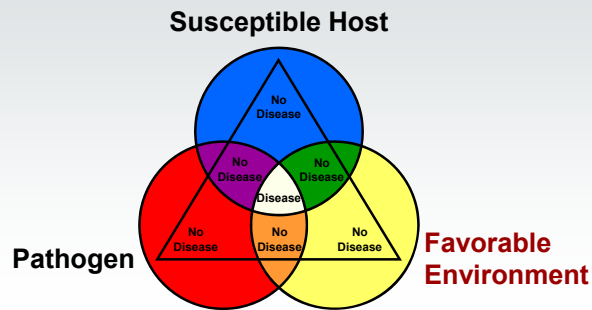
DNA-Based Techniques



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Plant Disease Diagnosis The Disease Triangle



Plant Disease Diagnosis Favorable Environment

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

Plant Disease Diagnosis Favorable Environment

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

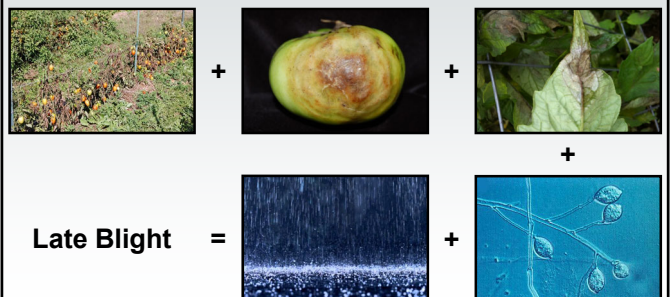
Plant Disease Diagnosis Favorable Environment

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

Plant Disease Diagnosis Favorable Environment

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

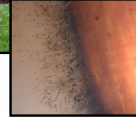
Plant Disease Diagnosis Putting It All Together



Plant Disease Diagnosis Putting It All Together



Plant Disease Diagnosis New Diseases



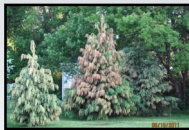
Koch's Postulates

- 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



Impreis Injury



Salt Damage



Blossom End Rot



2,4-D Injury



Urine Damage

Plant Disease Diagnosis Abiotic Disorders



Cold Injury



Drought Stress



Improper Planting



Heat Injury



Winter Injury

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
1630 Linden Drive
Madison, WI 53706-1598
(608) 262-2863
pddc@wisc.edu
<https://pddc.wisc.edu>

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