

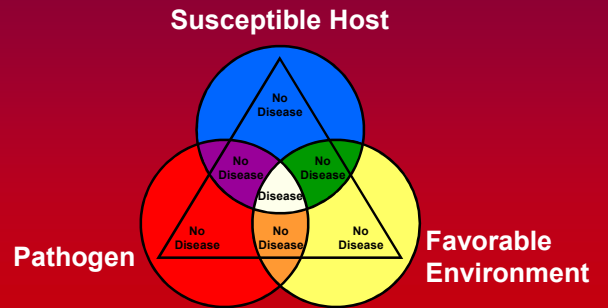
2019 Wisconsin Fresh Fruit and Vegetable Conference

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



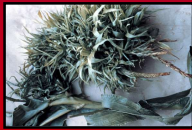
Common Corn Smut



Bean Rust



Southern Blight



Crazy Top



White Mold

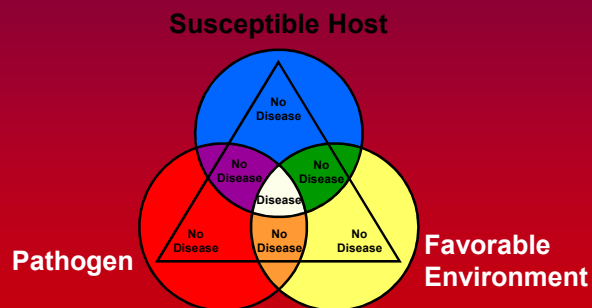
Plant Disease Diagnosis “The Rest . . .”

Sample



Diagnosis

Plant Disease Diagnosis The Disease Triangle



Plant Disease Diagnosis Susceptible Host

Tomato



Bacterial
Speck



Late
Blight



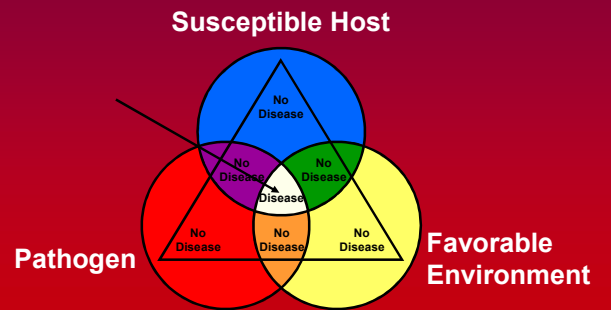
Septoria
Leaf Spot

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

Overgrowths



Plant Disease Diagnosis Symptoms

Undergrowths



Plant Disease Diagnosis Symptoms

Wilts



Plant Disease Diagnosis Symptoms

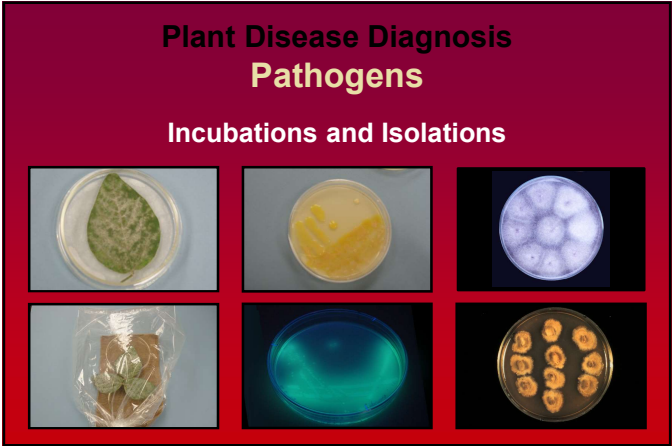
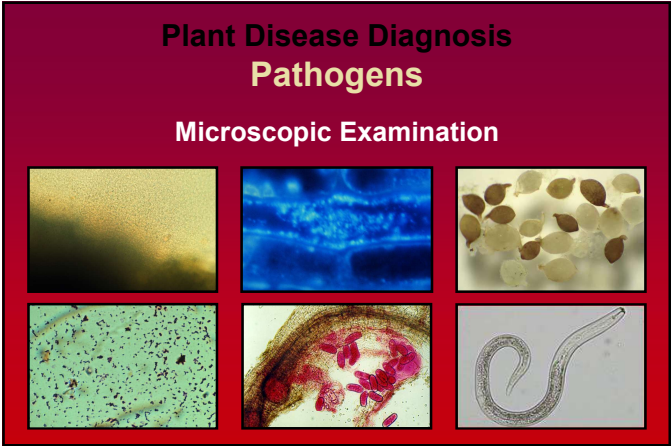
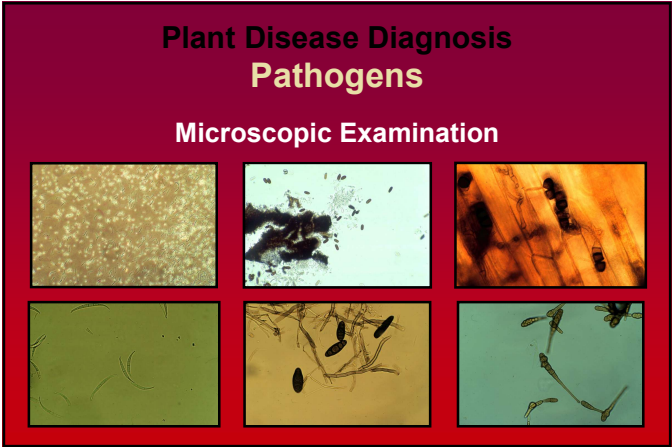
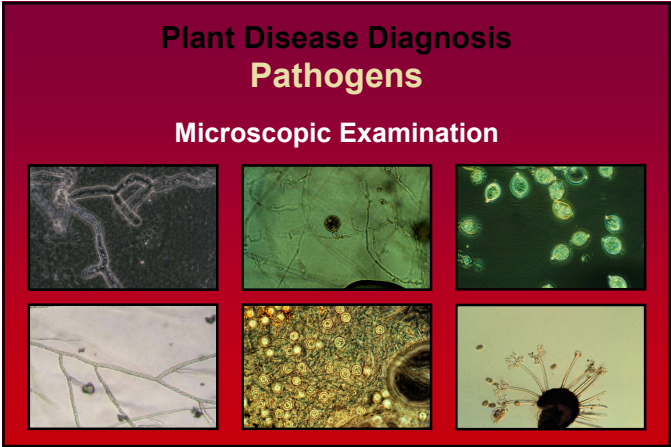
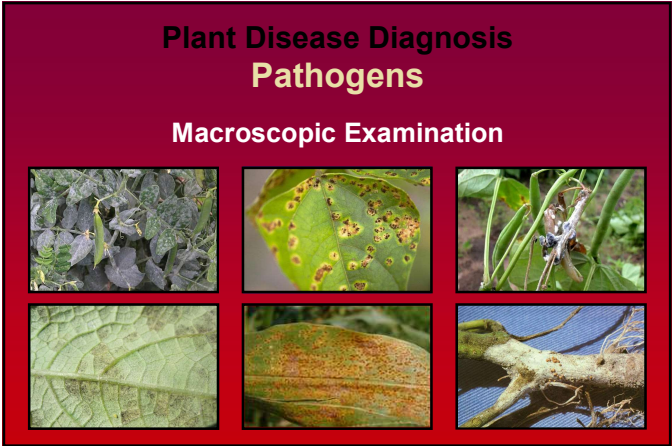
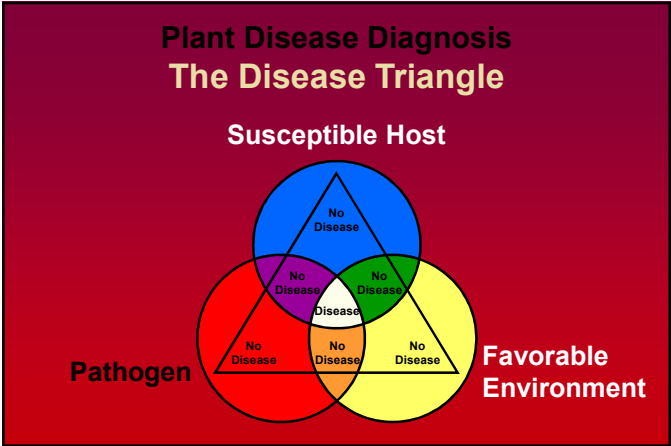
Spatial Patterns



Plant Disease Diagnosis Symptoms

Temporal Patterns





Plant Disease Diagnosis Pathogens

Bioassays



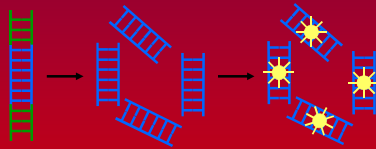
Plant Disease Diagnosis Pathogens

Serological Techniques



Plant Disease Diagnosis Pathogens

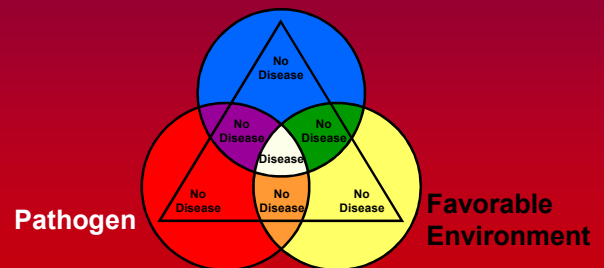
DNA-Based Techniques



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CAATGTCTGTGTGATGTGGGCTGGGGGAGCGTAATGAGTAACGCTCAGTACGTAATTTCTGTGCGGAATCAACACTT
ATCTTCTCCATTCTGTGAACCTCTTAATTAGATATGGAACCTGGCTACTATACAGCTACGCGAGTTTCTTACCGGGCGCATAGAGT
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TTAGCAGAGTTGAGAGCGCAGGCTCATGGAATTTCCAGCTAGCAAGCATGGAAATTGTATGCAAGCAAAATCATGGCGTAAGCTA

Plant Disease Diagnosis The Disease Triangle

Susceptible Host



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

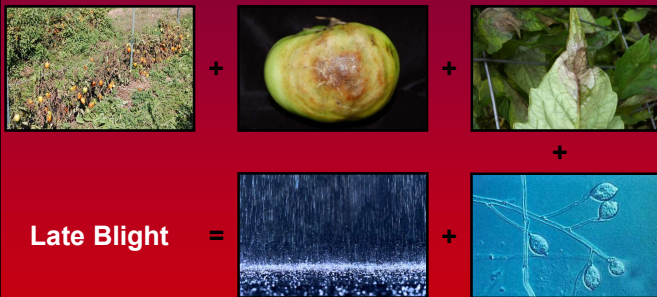
Plant Disease Diagnosis Favorable Environment

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

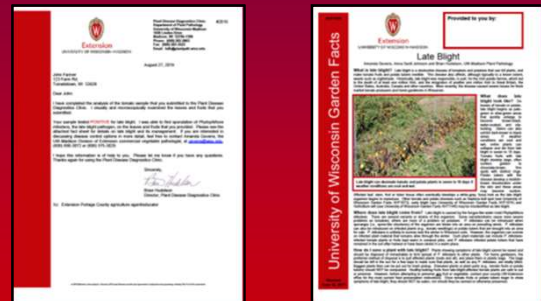
Plant Disease Diagnosis Favorable Environment

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

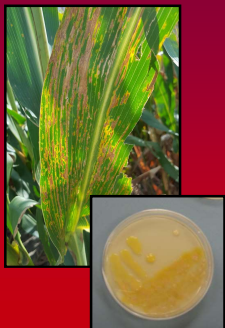
Plant Disease Diagnosis Putting It All Together



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



Glyphosate Injury



Walnut Toxicity



Blossom End Rot



2,4-D Injury



Cold Injury

Plant Disease Diagnosis Non-Diseases



Stink Bug Injury



Stink Horns



Slime Mold (*Physarum*)



Broad Mite Injury



Bird's Nest Fungi



Slime Mold (*Fuligo*)

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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