Fundamentals of Plant Diseases

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

The Disease Triangle

1. Susceptible Host
2. Pathogen
3. Environment

Causes of Plant Diseases

- Fungi/Fungi-Like Organisms
- Bacteria
- Viruses
- Nematodes
- Phytoplasmas
- Abiotic factors

Fungi/Fungi-Like Organisms

- Largest pathogen group
- More than 8000 pathogenic species
- Can be seen with the naked eye
- Vegetative growth through production of multicellular fungal threads (hyphae)
- Reproduce via spores
Fundamentals of Plant Diseases
Bacteria

- About 200 pathogenic species
- Can be seen with a light microscope
- Simple, unicellular
- Reproduce by binary fission
Fundamentals of Plant Diseases

Viruses

- Can only be seen using an electron microscope
- Extremely simple - nucleic acid with a protein coat
- Reproduce by taking over host reproductive machinery
- Often associated with insect vectors
Funky bacteria
Small, wall-less
Phloem limited
Usually seen only with an electron microscope
Reproduce by binary fission
Transmitted by insects (leafhoppers)
Fundamentals of Plant Diseases
Nematodes

- Parasitic worms
- Very complex compared to other pathogens
- Usually seen only with a light microscope
- Reproduce by eggs
Fundamentals of Plant Diseases
Abiotic Factors

- Nutritional abnormalities
- Pesticide exposure
- Environmental pollutants
- Adverse weather conditions
Fundamentals of Plant Diseases
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
Follow on Facebook, Twitter, YouTube: @UWPDDC
Subscribe to the PDDC Listserv: UWPDDCLearn

UW Soil and Forage Lab
4702 University Ave.
Madison, WI 53705
(608) 262-4364
https://uwlab.soils.wisc.edu