

## General Master Gardener Training

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### Plant Diseases

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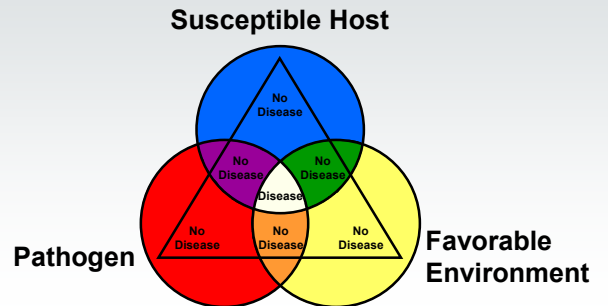


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## Plant Diseases The Disease Triangle

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## Plant Diseases Causes of Plant Diseases

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

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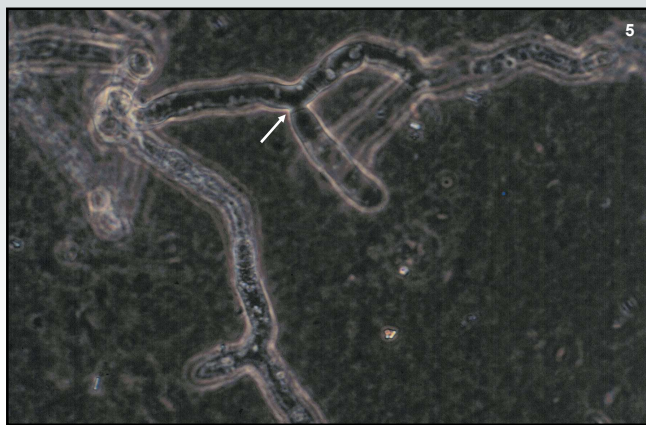
## Plant Diseases Fungi/Fungi-Like Organisms

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- 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

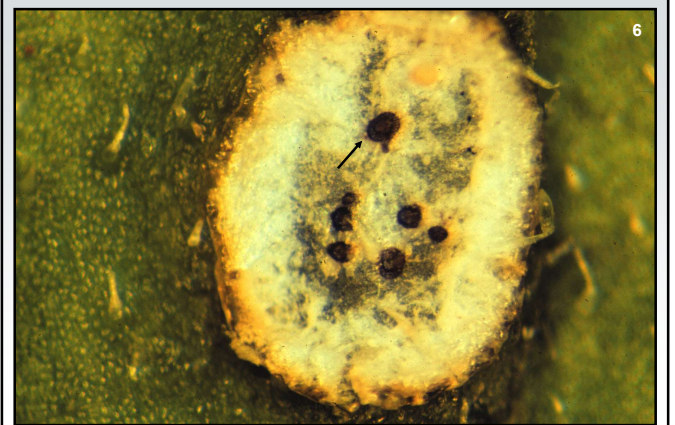
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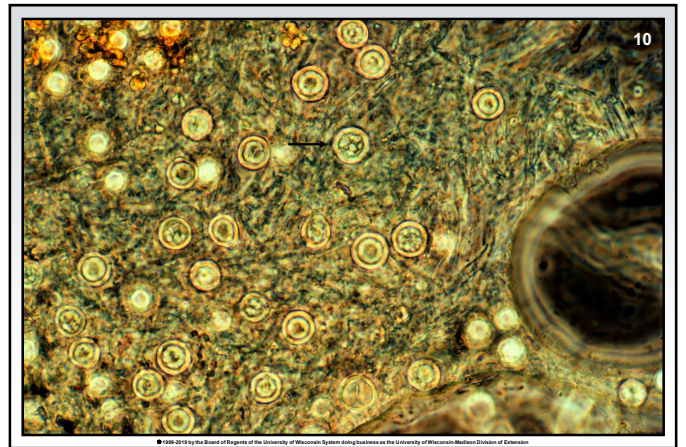
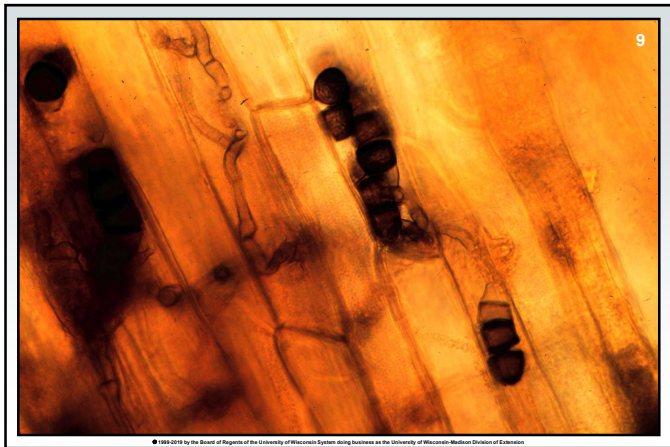
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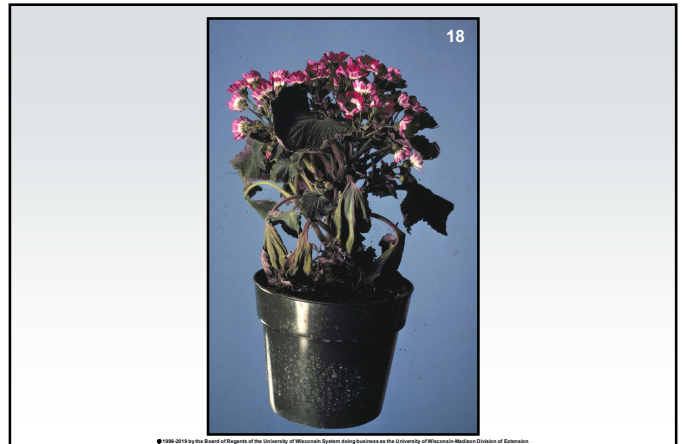
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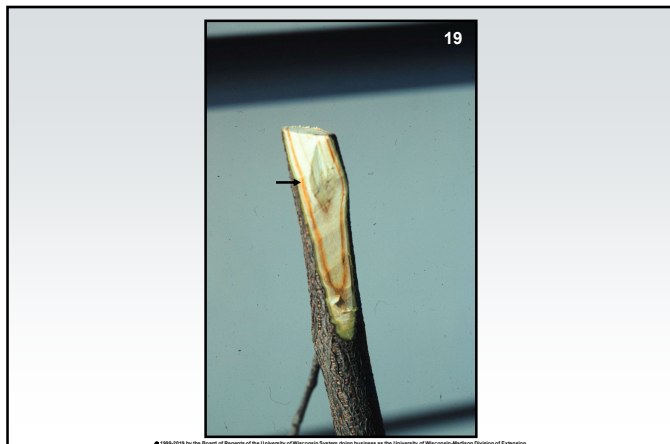
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## Plant Diseases

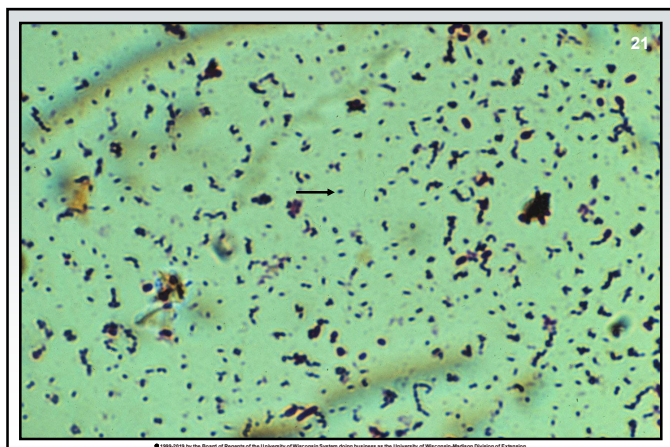
### Bacteria

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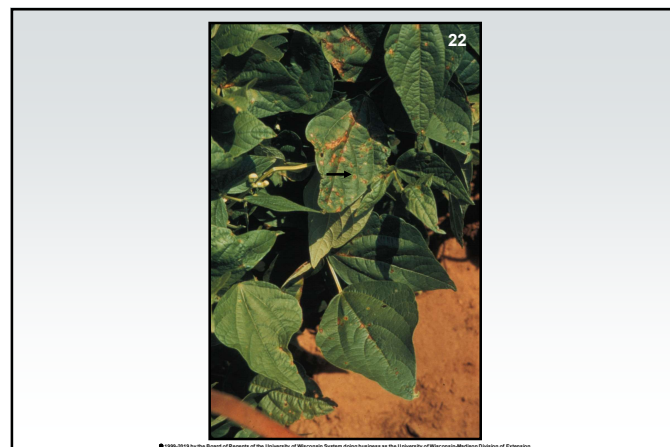
- About 200 pathogenic species
- Can be seen with a light microscope
- Simple, unicellular
- Reproduce by binary fission

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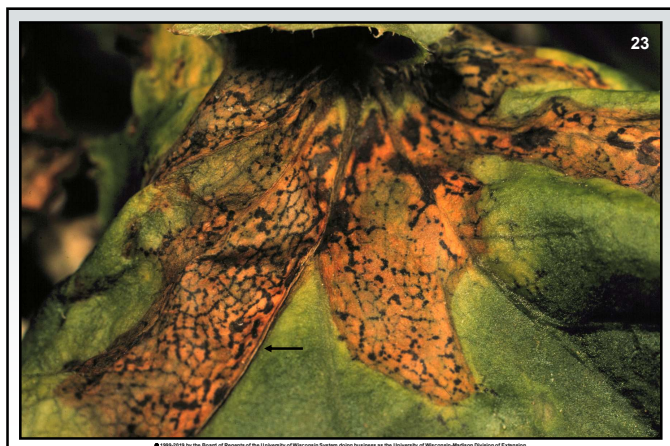
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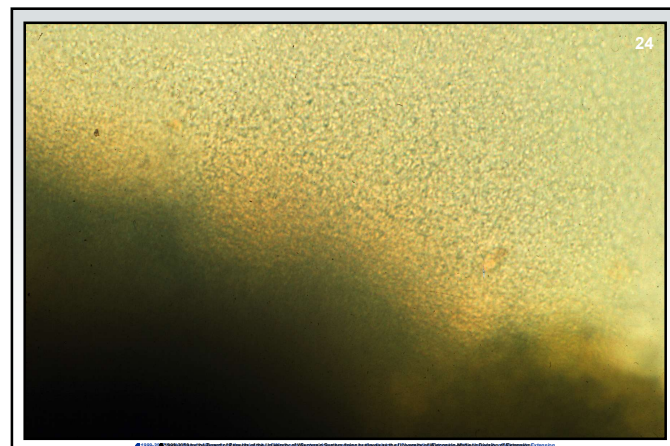
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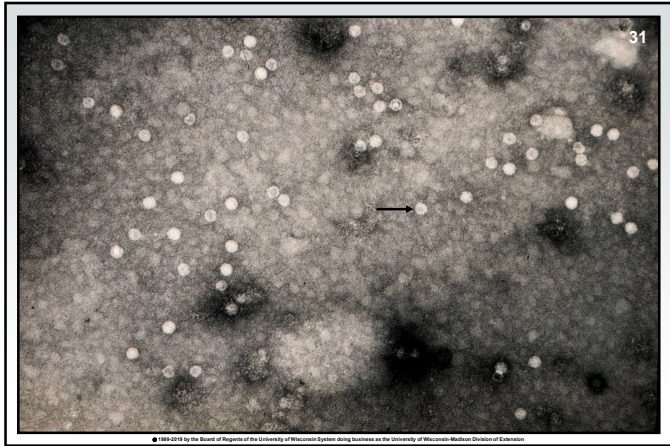
## Plant Diseases

### 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

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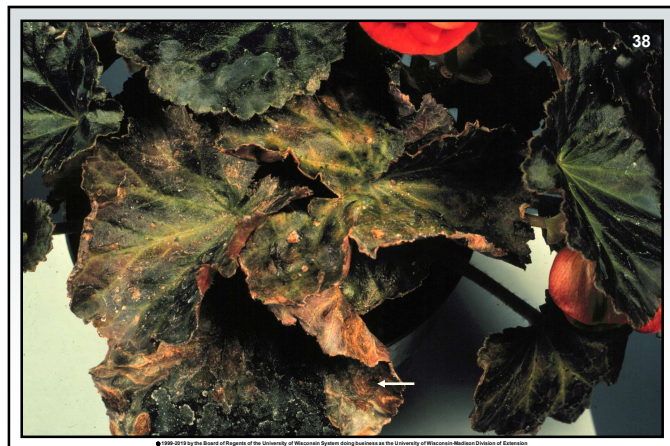


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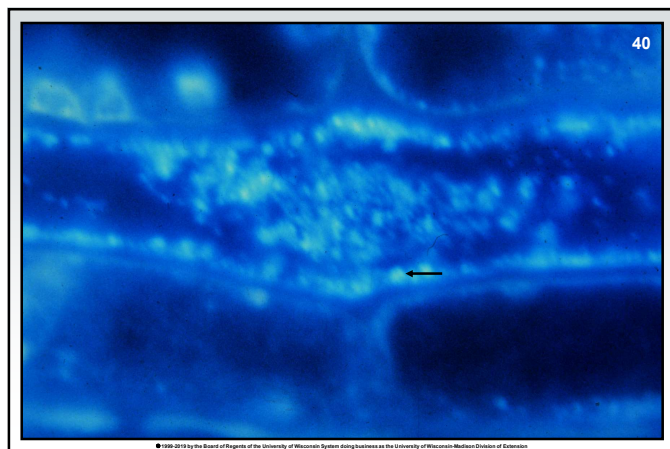
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**Plant Diseases**  
**Phytoplasmas**

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- Funky bacteria
- Small, wall-less
- Phloem limited
- Usually seen only with an electron microscope
- Reproduce by binary fission
- Transmitted by insects (leafhoppers)

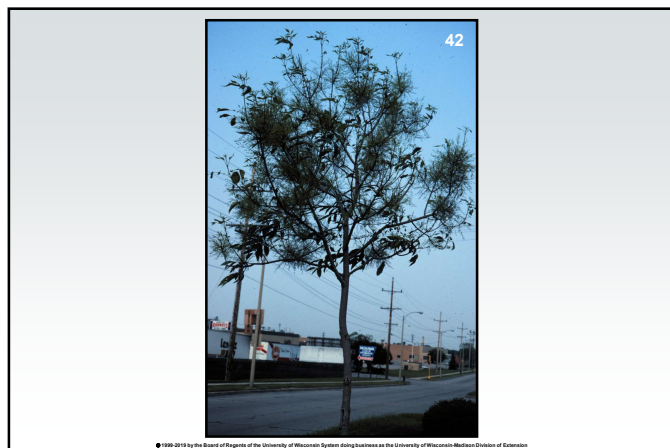
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## Plant Diseases

### Nematodes

- Parasitic worms
- Very complex compared to other pathogens
- Usually seen only with a light microscope
- Reproduce by eggs

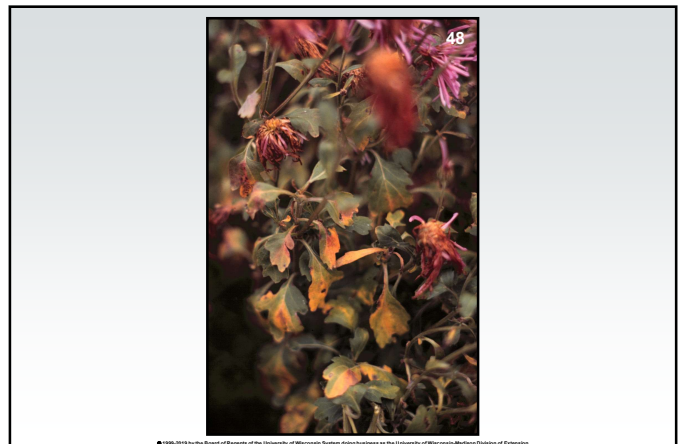
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## Plant Diseases Abiotic Factors

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- Nutritional abnormalities
- Pesticide exposure
- Environmental pollutants
- Adverse weather conditions

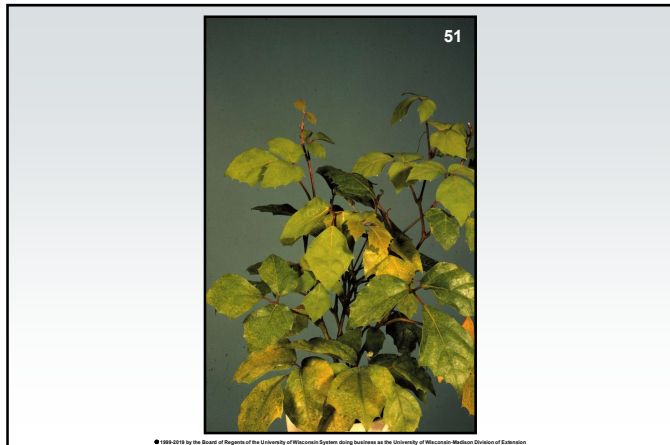
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## Plant Diseases Cultural Control

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- **Avoid pathogens**
  - Buy seed from a reputable source
  - Inspect plants prior to purchase for above and below ground pathogens/diseases
  - Inspect plants for insect pests
  - Control alternate hosts
  - Use non-contaminated water

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## Plant Diseases Cultural Control

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- **Avoid conducive environmental conditions**
  - Moderate soil moisture
  - Reduce humidity
  - Have balanced nutrition
  - Prevent water/heat stress
  - Be aware of activities surrounding your plants

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## Plant Diseases Cultural Control

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- **Sanitation**
  - Disinfest tools
  - Adequately clean pots and benches
  - Pasteurize soil prior to use
  - Decontaminate recycled water
  - Remove diseased plants promptly
  - Remove senescent plant parts promptly

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## Plant Diseases Chemical Control

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- **Protectant fungicides/bactericides**
- **Systemic fungicides/bactericides**
- **Fumigants**

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## **Plant Diseases** Chemical Control

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- Use registered/labeled materials only
- Use products safely
- Get training

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## **Plant Diseases** Biological Control

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- Disease resistance
- Biological pesticides
  - Plant extracts
  - Antagonistic microorganisms

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## **Plant Diseases** Where to Go for Help

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**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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## **Plant Diseases** Where to Go for Help

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**UW Soil and Forage Lab  
2611 Yellowstone Drive  
Marshfield, WI 54449  
(715) 387-2523  
<https://uwlabs.soils.wisc.edu>**

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