

## 2025 PDDC Plant Disease Talks

### Deciduous Tree and Shrub Diseases

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### Deciduous Tree and Shrub Diseases Powdery Mildews

#### • Pathogens

- *Erysiphe* spp.
- *Uncinula* spp.
- *Phyllactinia* spp.
- *Blumeria* spp.
- *Oidium* spp.
- *Microsphaera* spp.
- *Sphaerotheca* spp.
- *Podosphaera* spp.
- *Brasiliomyces* spp.
- *Ovulariopsis* spp.

### Deciduous Tree and Shrub Diseases Powdery Mildews

#### • Hosts

- Virtually everything
  - Not conifers
- #### • Favorable environment: High humidity



### Deciduous Tree and Shrub Diseases Powdery Mildews

#### • Control

- Remove/destroy diseased leaves
  - Burn (where allowed)
  - Deep bury
  - Hot compost
- Reduce humidity
  - Plant less densely
  - Thin canopies
- Use resistant cultivars/varieties

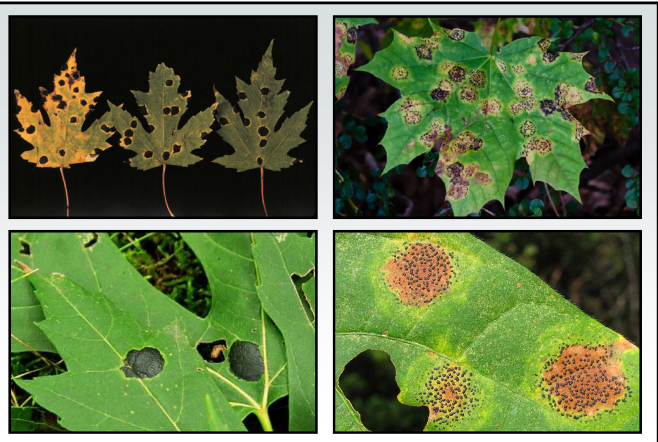
### Deciduous Tree and Shrub Diseases Powdery Mildews

#### • Control

- Use fungicides to prevent infections
  - Dinocap, dithiocarbamates, myclobutanil, triadimefon, triforine, sulfur or thiophanate-methyl
  - Baking soda (1.5 Tbsp/gal) and light weight horticultural oil (3 Tbsp/gal)
  - Alternate active ingredients (FRAC codes)
  - Apply when humidity >60-70%
  - Apply at 7 to 14-day intervals

## Deciduous Tree and Shrub Diseases Tar Spot

- Pathogens
  - *Rhytisma americanum*
  - *Rhytisma acerinum*
- Hosts: Maples
- Favorable environment: Cool, wet weather



## Deciduous Tree and Shrub Diseases Tar Spot

- Control
  - DO NOT panic
  - Remove/destroy diseased leaves
    - Burn (where allowed)
    - Deep bury
    - Hot compost
  - Use fungicides to prevent infections
    - Copper
    - Apply at bud break, 1/2 and full leaf expansion

## Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

- Pathogens
  - *Venturia inaequalis*
  - *Venturia pirina*
- Hosts
  - Apple/crabapple
  - Pear
  - Mountain ash
- Favorable environment: Cool, wet weather



## Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

- Control
  - Plant resistant varieties
    - “Home Fruit Cultivars for Northern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
    - “Home Fruit Cultivars for Southern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
    - “Top Ornamental Crabapples for Wisconsin” (<https://hort.extension.wisc.edu/>)

## Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

- **Control**
  - Remove/destroy diseased leaves
    - Burn (where allowed)
    - Deep bury
    - Hot compost
  - Thin trees to promote air flow

## Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

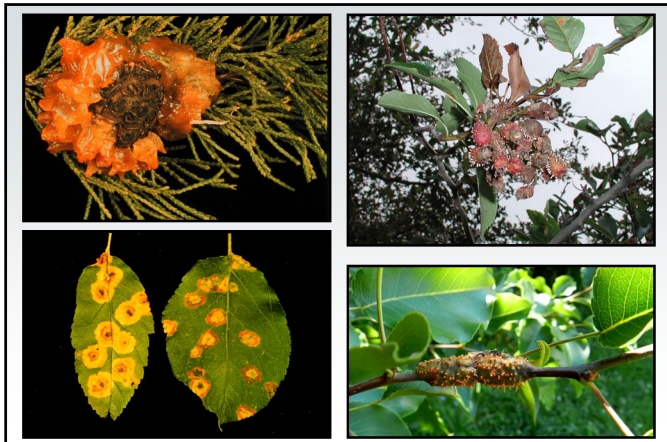
- **Control**
  - Use fungicides to prevent infections
    - Chlorothalonil, copper, mancozeb, myclobutanil, propiconazole, thiophanate-methyl, sulfur
    - Alternate active ingredients (FRAC codes)
    - Apply from bud break through the end of favorable weather
    - Apply at 7 to 14-day intervals

## Deciduous Tree and Shrub Diseases Gymnosporangium Rusts

- **Pathogens: *Gymnosporangium* spp.**
  - *Gymnosporangium juniperi-virginianae* (Cedar-apple rust)
  - *Gymnosporangium globosum* (Cedar-hawthorn rust)
  - *Gymnosporangium clavipes* (Cedar-quince rust)
  - *Gymnosporangium yamadae* – NEW! (Red star rust)

## Deciduous Tree and Shrub Diseases Gymnosporangium Rusts

- **Hosts**
  - Junipers
  - Rosaceous plants
    - Apple, crabapple
    - Hawthorn
    - Quince
    - Pear
    - Serviceberry
- **Favorable environment: Wet weather**



## Deciduous Tree and Shrub Diseases Gymnosporangium Rusts

- **Control**
  - Grow only junipers or rosaceous hosts
  - Use resistant cultivars/varieties
    - “Home Fruit Cultivars for Northern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
    - “Home Fruit Cultivars for Southern Wisconsin” (<https://learningstore.extension.wisc.edu/>)

## Deciduous Tree and Shrub Diseases Gymnosporangium Rusts

- **Control**
  - Remove galls
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Destroy infected materials
    - Burn (where allowed)
    - Deep bury

## Deciduous Tree and Shrub Diseases Gymnosporangium Rusts

- **Control**
  - Use fungicides to prevent infections (?)
    - Treat rosaceous hosts
    - Chlorothalonil, copper, ferbam, mancozeb, propiconazole, sulfur, and triadimefon
    - Alternate active ingredients (FRAC Codes)
    - Apply when flowers first show color, when half of flowers open, at petal fall, 7 to 10 days after petal fall, and 10 to 14 days later

## Deciduous Tree and Shrub Diseases Black Knot

- **Pathogen:** *Apiosporina morbosa*
- **Hosts:** *Prunus* spp.
  - Plums
  - Cherries
- **Favorable environment:** Wet weather



## Deciduous Tree and Shrub Diseases Black Knot

- **Control**
  - DO NOT plant infected *Prunus* stock
  - Buy black knot-resistant varieties if available
    - Accolade flowering cherry (*Prunus* ‘Accolade’)
    - Sargent’s cherry (*Prunus sargentii*)
    - Amur chokecherry (*Prunus maackii*)
  - Remove volunteer plums/cherries
  - Prune diseased branches

## Deciduous Tree and Shrub Diseases Black Knot

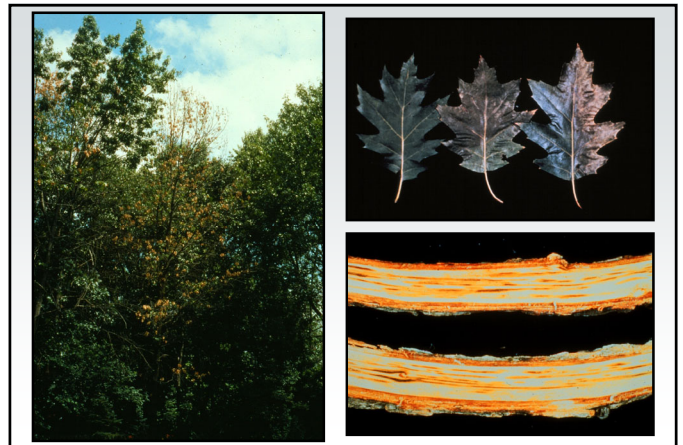
- **Control**
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Destroy infected materials
    - Burn (where allowed)
    - Deep bury
  - DO NOT use fungicides

## Deciduous Tree and Shrub Diseases Oak Wilt

- **Pathogen**
  - *Bretziella fagacearum* (*Ceratocystis fagacearum*)
  - *Chalara* sp.
- **Hosts**
  - Red oak group: Red, black, pin
  - White oak group: White, bur, swamp white
  - Chinese chestnut

## Deciduous Tree and Shrub Diseases Oak Wilt

- **Favorable environment**
  - Cool, wet conditions (for infection)
  - Hot, dry weather (for symptom development)



## Deciduous Tree and Shrub Diseases Oak Wilt

- **Transmission**
  - Oak bark beetles
    - *Pseudopityophthorus minutissimus*
    - *Pseudopityophthorus pruinosis*
  - Sap beetles
    - *Carpophilus* spp.
    - *Epuraea* spp.
    - *Colopterus* spp.
    - *Clischrochilus* spp.
    - *Cryptarcha* spp.

## Deciduous Tree and Shrub Diseases Oak Wilt

- **Transmission**
  - Root grafts
    - Major method of movement in clumps of oaks
    - Commonly form between trees in the same group
      - Red oak group: Red, black, pin
      - White oak group: White, bur, swamp white
    - Rarely form between trees in different groups
    - Movement of up to 20-25 ft/year



## Deciduous Tree and Shrub Diseases Oak Wilt

- **Control**
  - DO NOT prune or wound oaks from bud break through 2-3 weeks past full leaf development
  - Disrupt root grafts
    - “Oak Wilt Management”  
(<https://widnr.widen.net/s/nwf2cgskdnr/fr-825-oak-wilt-management-fact-sheet>)
    - Mechanically (vibratory plow or trenching machine)
    - Chemically (soil fumigant)
    - Physical barriers

## Deciduous Tree and Shrub Diseases Oak Wilt

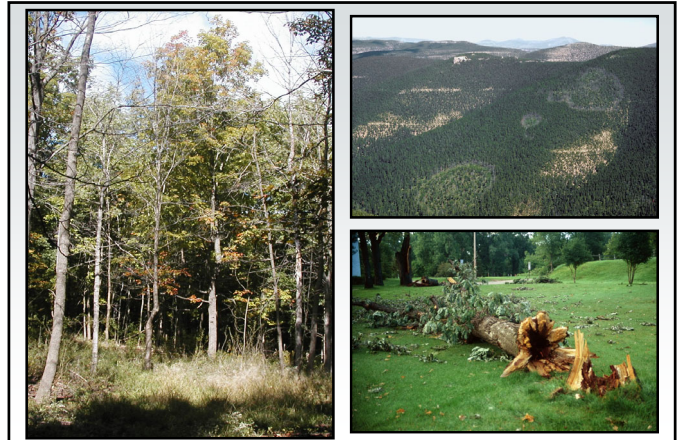
- **Control**
  - Remove diseased (and healthy) trees
  - Decontaminate pruning tools  
(70% alcohol, disinfectants, bleach)
  - Be careful using oak wood
    - Remove bark
    - Cover wood

## Deciduous Tree and Shrub Diseases Oak Wilt

- **Control**
  - Use fungicide injections
    - Propiconazole
    - Prophylactic or therapeutic
    - Inject every 12-24 months

## Deciduous Tree and Shrub Diseases Armillaria Root Disease

- **Pathogens:** *Armillaria* spp.
- **Hosts**
  - Many deciduous trees and shrubs
  - Many conifers
- **Favorable environment**
  - Drought stress
  - Defoliation stress
  - Other stresses





## Deciduous Tree and Shrub Diseases Armillaria Root Disease

- **Control**
  - Reduce tree/shrub stress where possible
    - Water adequately
    - Fertilize properly
    - Control foliar pathogens
    - Control foliar insect pests
  - **DO NOT** wound trees
  - Remove *Armillaria*-infested materials
  - **DO NOT** use fungicides

## Deciduous Tree and Shrub Diseases Verticillium Wilt

- **Pathogens**
  - *Verticillium dahliae*
  - *Verticillium albo-atrum*
  - Other *Verticillium* spp.
  - New *Verticillium* spp.

## Deciduous Tree and Shrub Diseases Verticillium Wilt

- **Hosts**
  - Many woody ornamentals
    - Common: Maple, ash, redbud, smokebush
    - New: Red-twigged dogwood
  - Many vegetables
    - Tomato, potato, pepper, EGGPLANT, cucurbits
  - Many herbaceous plants
    - Common: Purple coneflower, blazing star
    - New: Gasplant

## Deciduous Tree and Shrub Diseases Verticillium Wilt

- **Favorable environment**
  - Cool, wet weather (for infection)
  - Hot, dry weather (for symptom development)





## Deciduous Tree and Shrub Diseases Verticillium Wilt

- **Control**
  - Avoid *Verticillium*-infested areas
  - Pretest soils/mulches/composts for the presence of *Verticillium*
  - Fumigate heavily infested soils
  - Keep broad-leaf weeds under control
  - Clean up leaf litter
  - Avoid municipal mulches

## Deciduous Tree and Shrub Diseases Verticillium Wilt

- **Control**
  - Use immune/resistant plants
    - CONIFERS: Pines, spruces, firs, junipers
    - DECIDUOUS TREES/SHRUBS: Beech, birch, ginkgo, hackberry, hawthorn, hickory, honey locust, mountain ash, white oak, bur oak, poplar, serviceberry, sycamore, willow
  - Prevent stress
  - Prune diseased (wilted) areas

## Deciduous Tree and Shrub Diseases Verticillium Wilt

- **Control**
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Make plants comfortable until they die
  - Remove and destroy diseased plants/leaves
    - Burn (where allowed)
    - Hot compost (?)
  - DO NOT use fungicides

## Deciduous Tree and Shrub Diseases Fire Blight

- **Pathogen:** *Erwinia amylovora*
- **Hosts**
  - Many woody rosaceous plants
  - Apple, crabapple, pear, mountain ash, cotoneaster
- **Favorable environment**
  - Wet weather (but not too wet)
  - Hail (or other wounding)





## Deciduous Tree and Shrub Diseases Fire Blight

- **Control**
  - Plant resistant varieties
    - “Home Fruit Cultivars for Northern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
    - “Home Fruit Cultivars for Southern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
    - “Top Ornamental Crabapples for Wisconsin” (<https://hort.extension.wisc.edu/>)
  - Prune diseased branches

## Deciduous Tree and Shrub Diseases Fire Blight

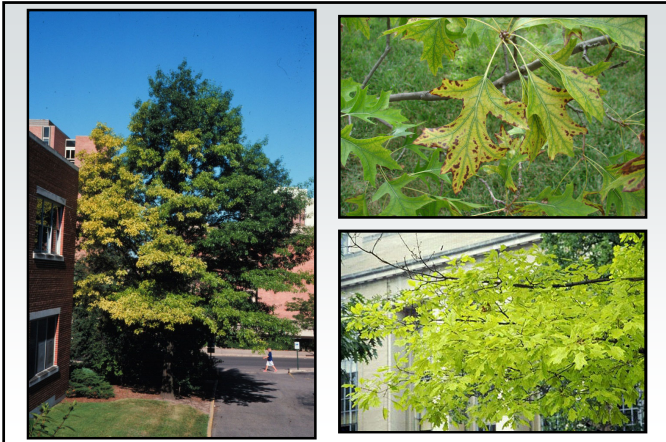
- **Control**
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Destroy infected materials
    - Burn (where allowed)
    - Deep bury
  - DO NOT over-fertilize with nitrogen

## Deciduous Tree and Shrub Diseases Fire Blight

- **Control**
  - Use bactericides to prevent infections (?)
    - Copper, streptomycin
    - Apply
      - Pre-bloom (copper)
      - During flowering (streptomycin)
    - Apply every
      - Two applications at spaced 4 days apart (copper)
      - Multiple applications spaced 3-4 days apart (streptomycin)

## Deciduous Tree and Shrub Diseases Chlorosis

- **Cause: Micronutrient (Fe or Mn) deficiency**
- **Affected plants**
  - Oaks (especially pin oak)
  - Red Maples
  - Rhododendrons
  - Other woody (and herbaceous) plants



## **Deciduous Tree and Shrub Diseases** **Chlorosis**

- **Control**
  - Plant the right plant in the right location
  - Monitor soil pH and soil nutrients
  - Decrease pH using sulfur or aluminum sulfate
  - Add chelated Fe and/or Mn as needed
  - Make sure plants are adequately watered
  - Minimize damage to plant root systems

## **Deciduous Tree and Shrub 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>**

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