

2023 PDDC Plant Disease Talks

Deciduous Tree and Shrub Diseases

Brian D. Hudelson

Department of Plant Pathology

University of Wisconsin-Madison/Extension



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

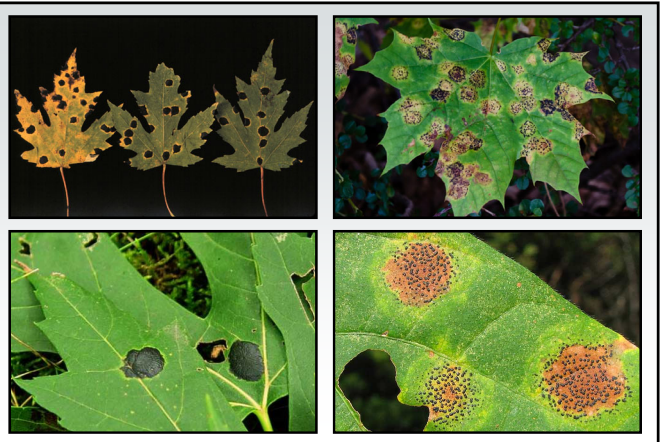
Deciduous Tree and Shrub Diseases Powdery Mildews

• 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)

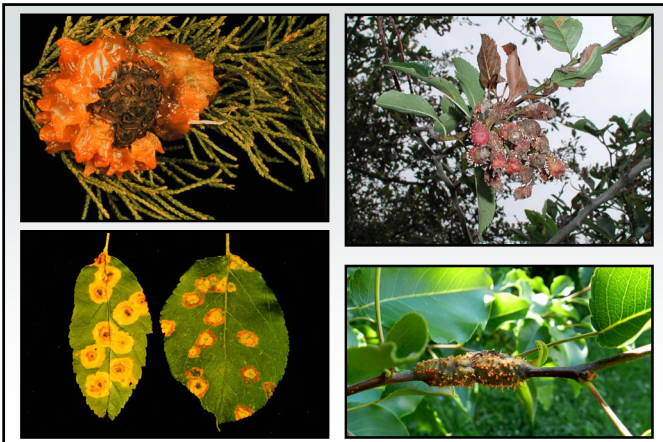
- **Control**
 - Use fungicides to prevent infections
 - Chlorothalonil, copper, mancozeb, myclobutanil, propiconazole, thiophanate-methyl, sulfur
 - Alternate active ingredients (FRAC codes)
 - Apply from bud break through the end of favorable weather
 - Apply at 7 to 14-day intervals

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! (Japanese apple 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
 - “Juniper Diseases”
(Available upon request)
 - “Disease and Insect Resistant Ornamental Plants: Juniperus (Junipers)”
(<https://ecommons.cornell.edu/handle/1813/56372.2>)

Deciduous Tree and Shrub Diseases Gymnosporangium Rusts

- **Control**
 - 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

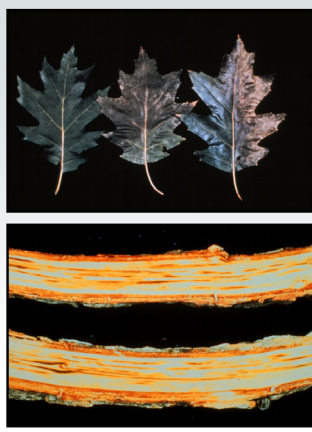
- **Control**
 - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT use fungicides

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 ninutissimus*
 - *Pseudopityophthorus pruinosis*
 - Sap beetles
 - *Carpophilus* spp.
 - *Eपुरaea* 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: What are the Options?” (<https://learningstore.extension.wisc.edu/>)
 - Mechanically (vibratory plow or trenching machine)
 - Chemically (soil fumigant)
 - Physical barriers

Deciduous Tree and Shrub Diseases Oak Wilt

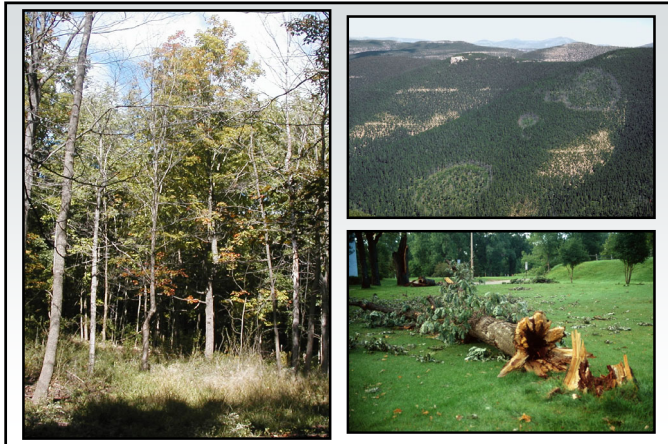
- **Control**
 - Remove diseased (and healthy) trees
 - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
 - Be careful using oak wood
 - Remove bark
 - Cover wood

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
 - Newer: Seven son flower, wafer-ash, buttonbush
 - Many vegetables
 - Tomato, potato, pepper, EGGPLANT, cucurbits
 - Many herbaceous plants
 - Common: Purple coneflower, blazing star
 - New: Vervain ('Quartz White')

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

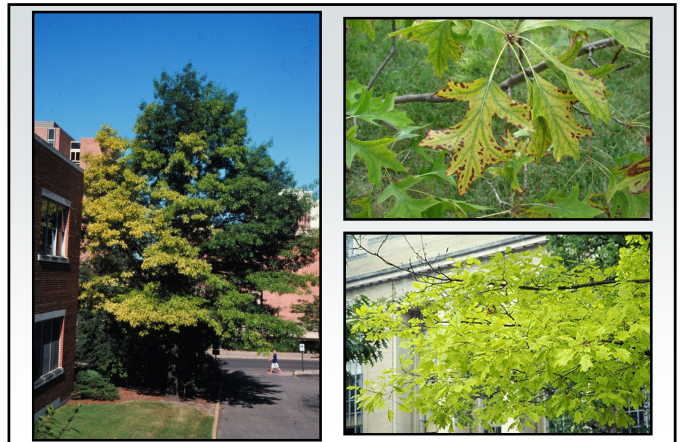
- **Control**
 - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT over-fertilize with nitrogen

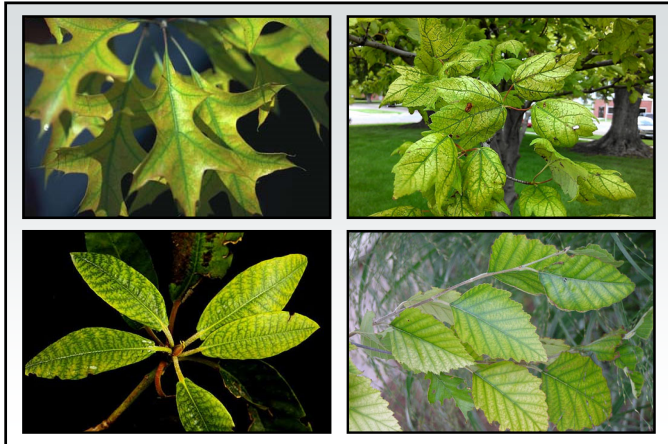
Deciduous Tree and Shrub Diseases Fire Blight

- **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 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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