Winnebago County MGV’s

Deciduous Tree and Shrub Diseases

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• Causes
  – Erysiphe spp.
  – Uncinula spp.
  – Phyllactinia spp.
  – Blumeria spp.
  – Oldium 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

• 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 7-14 day intervals
Deciduous Tree and Shrub Diseases

Anthracnose

• Causes
  – *Gloeosporium* spp. – *Discula* spp.
  – *Colletotrichum* spp. – Many other fungi

• Hosts
  – Any deciduous tree
  – Ash, maple, oak
  – Sycamore

• Favorable environment: Cool, wet weather

Deciduous Tree and Shrub Diseases

Anthracnose

• Control
  – DO NOT panic
  – Remove/destroy diseased leaves and branches
    • Burn (where allowed)
    • Deep bury
    • Hot compost

Deciduous Tree and Shrub Diseases

Anthracnose

• Control
  – Use fungicides to prevent infections
    • Copper, chlorothalonil, mancozeb,
      thiophanate-methyl
    • Alternate active ingredients (FRAC codes)
    • Apply at bud break, 1/2 and full leaf expansion

Deciduous Tree and Shrub Diseases

Scab (Apple and Pear)

• Causes
  – *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.uwex.edu)
    • “Home Fruit Cultivars for Southern Wisconsin” (https://learningstore.uwex.edu)
    • “Top Ornamental Crabapples for Wisconsin” (https://pddc.wisc.edu/fact-sheet-listing-all)

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 7-14 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)

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” (https://store.extension.iastate.edu/Product/Juniper-Diseases)
    • “Home Fruit Cultivars for Northern Wisconsin” (https://learningstore.uwex.edu/)
    • “Home Fruit Cultivars for Southern Wisconsin” (https://learningstore.uwex.edu/)

Deciduous Tree and Shrub Diseases

Gymnosporangium Rusts

• Control
  – Remove galls
  – Decontaminate pruning tools (70% alcohol, disinfectants, 10% 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

• Cause: *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, 10% bleach)
  – Destroy infected materials
    • Burn (where allowed)
    • Deep bury
  – DO NOT use fungicides

Deciduous Tree and Shrub Diseases

Oak Wilt

• Cause
  – 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
    • Pseudopiptophthorus ninutissimus
    • Pseudopiptophthorus pruinosus
  – Sap beetles
    • Carpophilus spp.
    • Colopterus spp.
    • Cryptarcha spp.
  • Epuraea spp.
  • Clischrochilus 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.uwex.edu)
    - Mechanically (vibratory plow or trenching machine)
    - Chemically (soil fumigant)
    - Physical barriers

- **Mechanically (vibratory plow or trenching machine)**
- **Chemically (soil fumigant)**
- **Physical barriers**

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**Verticillium Wilt**

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

- **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)

- 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

- 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

- Control
  - Decontaminate pruning tools (70% alcohol, disinfectants, 10% 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

Golden Canker

• Cause: *Cryptodiaporthe corni*
• Host: Pagoda dogwood
• Favorable environment
  – Water stress
  – Heat stress

Control
– Prune diseased branches
– Decontaminate pruning tools
  (70% alcohol, disinfectants, 10% bleach)
– Destroy infected materials
  • Burn (where allowed)
  • Deep bury

Deciduous Tree and Shrub Diseases

Golden Canker

• Control
  – Reduce plant stress
  • Consider tree placement
  • Water adequately
  • Fertilize appropriately
  – DO NOT use fungicides for control

Deciduous Tree and Shrub Diseases

Fire Blight

• Cause: *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.uwex.edu)
    • “Home Fruit Cultivars for Southern Wisconsin”
      (https://learningstore.uwex.edu)
    • “Top Ornamental Crabapples for Wisconsin”
      (https://pddc.wisc.edu/fact-sheet-listing-all)
  – Prune diseased branches

Deciduous Tree and Shrub Diseases
Fire Blight

• Control
  – Decontaminate pruning tools
    (70% alcohol, disinfectants, 10% 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 during flowering
    • Apply every 7-14 days (3-4 days)

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

- Management
  - 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 trees are adequately watered
  - Minimize damage to tree 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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