

Progreen Plus Open House

Diseases of Trees and Shrubs

Brian D. Hudelson

Department of Plant Pathology
University of Wisconsin-Madison/Extension



Diseases of Trees and Shrubs *Rhizosphaera* Needle Cast

- Pathogen: *Rhizosphaera kalkhoffii*
(*Rhizosphaera* spp.)
- Hosts (major)
 - Colorado blue spruce
 - Other spruces: Engelmann, black, Serbian, Sitka, white (Black Hills)

Diseases of Trees and Shrubs *Rhizosphaera* Needle Cast

- Hosts (minor)
 - Pines: Austrian, mugo, eastern white pine
 - Douglas fir
 - Hemlock
 - Balsam fir and other firs
- Favorable environment
 - Wet weather
 - High humidity



Diseases of Trees and Shrubs *Rhizosphaera* Needle Cast

- Control
 - DO NOT plant Colorado blue spruce
 - DO NOT crowd trees when planting
 - Thin healthy branches to increase airflow
 - Prevent tree stress
 - Prune diseased branches

Diseases of Trees and Shrubs *Rhizosphaera* Needle Cast

- Control
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - Hot compost (needles)

Diseases of Trees and Shrubs *Rhizosphaera* Needle Cast

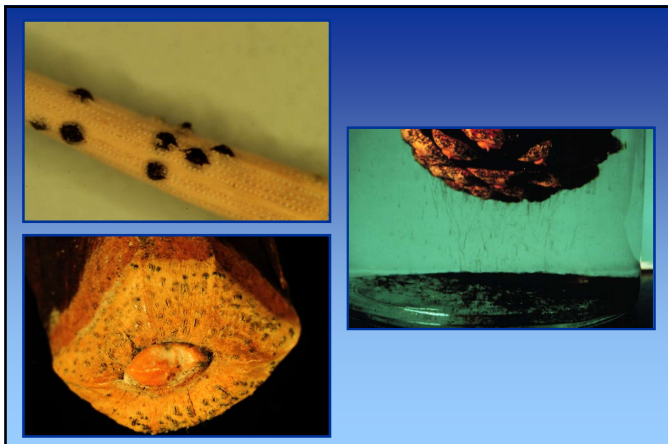
- **Control**
 - Use fungicides to prevent infections
 - Copper-containing fungicides, chlorothalonil
 - Alternate active ingredients (FRAC codes)
 - Apply starting at bud break and at 3-4 week intervals thereafter under favorable conditions

Diseases of Trees and Shrubs *Diplodia* (*Sphaeropsis*) Shoot Blight

- **Pathogen:** *Diplodia pinea*
(*Sphaeropsis sapinea*)
- **Hosts (major)**
 - Austrian pine
 - Other pines: red, jack, Scots, mugo
- **Hosts (minor)**
 - Other conifers: cedars, cypresses, firs, spruces, junipers, yews

Diseases of Trees and Shrubs *Diplodia* (*Sphaeropsis*) Shoot Blight

- **Favorable environment**
 - Wet weather (for infection)
 - Drought (for extensive colonization)



Diseases of Trees and Shrubs *Diplodia* (*Sphaeropsis*) Shoot Blight

- **Control**
 - DO NOT plant Austrian pines
 - Prevent tree stress, particularly water stress
 - Thin branches to increase airflow
 - Prune diseased branches

Diseases of Trees and Shrubs *Diplodia (Sphaeropsis) Shoot Blight*

- **Control**
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - Remove infected cones (?)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury

Diseases of Trees and Shrubs *Diplodia (Sphaeropsis) Shoot Blight*

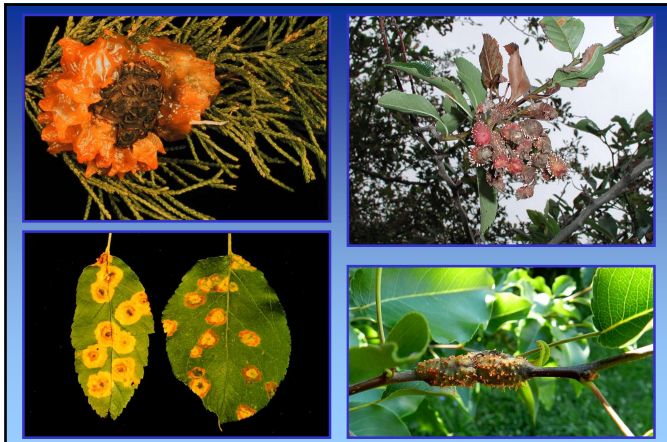
- **Control**
 - Use fungicides to prevent infections
 - Thiophanate-methyl, chlorothalonil
 - Alternate active ingredients (FRAC Codes)
 - Apply from bud break through shoot elongation
 - Apply every 14 days

Diseases of Trees and Shrubs *Gymnosporangium Rusts*

- **Causes**
 - *Gymnosporangium juniper-virginianae*
(Cedar-apple rust)
 - *Gymnosporangium globosum*
(Cedar-hawthorn rust)
 - *Gymnosporangium clavipes*
(Cedar-quince rust)

Diseases of Trees and Shrubs *Gymnosporangium Rusts*

- **Hosts**
 - Junipers
 - Woody rosaceous plants
(apple, crabapple, hawthorn, quince, pear, serviceberry)
- **Favorable environment**
 - Cool to moderate temperatures
 - Wet



Diseases of Trees and Shrubs *Gymnosporangium Rusts*

- **Control**
 - Grow only the juniper or rosaceous host
 - Use resistant cultivars/varieties
 - “Juniper Diseases”
(<https://www.plantpath.k-state.edu/doc/extension/c711.pdf>)
 - Remove galls

Diseases of Trees and Shrubs Gymnosporangium Rusts

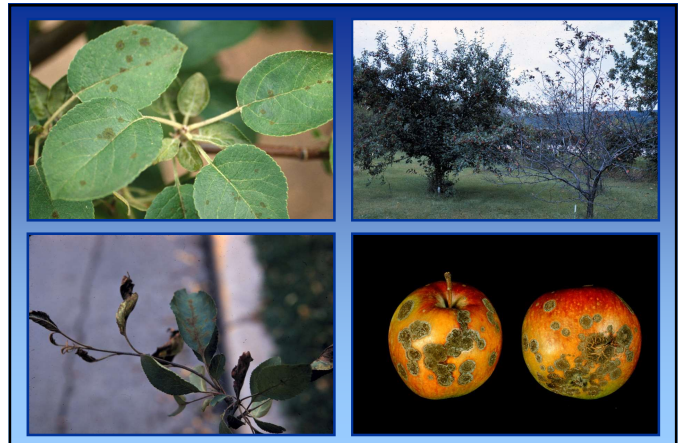
- **Control**
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury

Diseases of Trees and Shrubs Gymnosporangium Rusts

- **Control**
 - Use fungicides to prevent infections
 - Ferbam, triadimefon
 - Alternate active ingredients (FRAC codes)
 - Apply at 7-21 day intervals [mid-May through mid-June (rosaceous hosts), early July through August (juniper hosts)]

Diseases of Trees and Shrubs Scab (Apple and Pear)

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



Diseases of Trees and Shrubs Scab (Apple and Pear)

- **Control**
 - Plant resistant varieties
 - “Growing Apples (Pears) in Wisconsin” (<https://learningstore.uwex.edu/>)
 - Remove/destroy diseased leaves
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Thin trees to promote air flow

Diseases of Trees and Shrubs 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

Diseases of Trees and Shrubs **Black Spot**

- Cause: Marssonina rosae
- Host: Rose
- Favorable environment: Cool, wet weather



Diseases of Trees and Shrubs **Black Spot**

- Control
 - Plant resistant rose varieties
 - Promote rapid drying of leaves and canes
 - DO NOT overcrowd plants
 - Prune to thin established plants
 - DO NOT overhead water
 - DO NOT overwater

Diseases of Trees and Shrubs **Black Spot**

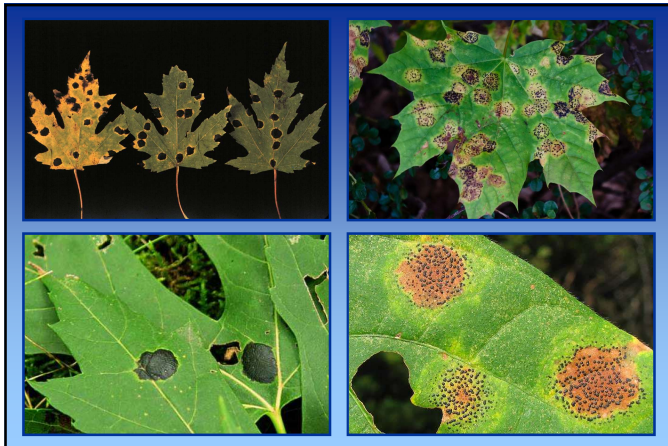
- Control
 - Remove/destroy diseased leaves and canes
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach

Diseases of Trees and Shrubs **Black Spot**

- Control
 - Use fungicides to prevent infections
 - Chlorothalonil, copper-containing fungicides, mancozeb, maneb, myclobutanil, propiconazole, thiophanate-methyl
 - Neem oil
 - Baking soda (1.5 Tbsp/gal) and light weight horticultural oil (3 Tbsp/gal)
 - Alternate active ingredients (FRAC Codes)
 - Apply at 7-14 day intervals

Diseases of Trees and Shrubs **Tar Spot**

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



Diseases of Trees and Shrubs Tar Spot

- **Control**
 - **DO NOT panic**
 - **Remove/destroy diseased leaves**
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - **Use fungicides to prevent infections**
 - Copper
 - Apply 3 applications: at bud break, 1/2 expansion of leaves, full leaf expansion

Diseases of Trees and Shrubs Black Knot

- **Cause:** *Apiosporina morbosa*
- **Hosts**
 - *Prunus* species
 - Plums
 - Cherries
- **Favorable environment:** Wet weather



Diseases of Trees and Shrubs 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**

Diseases of Trees and Shrubs Black Knot

- **Control**
 - **Decontaminate pruning tools**
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - **Destroy infected materials**
 - Burn (where allowed)
 - Deep bury
 - **DO NOT use fungicides**

Diseases of Trees and Shrubs **Fire Blight**

- **Cause:** Erwinia amylovora
- **Hosts**
 - Many woody rosaceous plants
 - Apple, crabapple, pear, mountain ash, cotoneaster
- **Favorable environment**
 - Wet weather
 - Hail (or other wounding)



Diseases of Trees and Shrubs **Fire Blight**

- **Control**
 - Plant resistant varieties where available
 - “Top Ornamental Crabapples for Wisconsin” (<https://pddc.wisc.edu/fact-sheet-listing-all/>)
 - Prune diseased branches
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach

Diseases of Trees and Shrubs **Fire Blight**

- **Control**
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT over-fertilize with nitrogen
 - Use bactericides to prevent infections (?)
 - Copper-containing fungicides, streptomycin
 - Apply during flowering
 - Apply every 7-14 days (3-4 days)

Diseases of Trees and Shrubs **Verticillium Wilt**

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

Diseases of Trees and Shrubs **Verticillium Wilt**

- **Hosts**
 - Many woody ornamentals
 - Common: Maple, ash, redbud, smokebush
 - “New”: Seven son flower, wafer-ash, buttonbush
 - Many herbaceous plants
 - Many vegetables (tomato, potato, EGGPLANT)
- **Favorable environment**
 - Cool, wet weather (for infection)
 - Hot, dry weather (for symptom development)



Diseases of Trees and Shrubs **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
 - Avoid municipal mulches

Diseases of Trees and Shrubs **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
 - Decontaminate pruning tools

Diseases of Trees and Shrubs **Verticillium Wilt**

- **Control**
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - Make plants comfortable until they die
 - Remove and destroy diseased plants
 - Burn (where allowed)
 - DO NOT use fungicides

Diseases of Trees and Shrubs **Chlorosis**

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





Diseases of Trees and Shrubs **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

Diseases of Trees and Shrubs **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
<http://pddc.wisc.edu>

Follow on Facebook and Twitter @UWPDDC