Diseases of Conifers

Rhizosphaera Needle Cast

- Pathogens: *Rhizosphaera kalkhoffii*  
  *Rhizosphaera* spp.
- Look-Alike: *Stigmina Needle Cast*  
  (*Stigmina* spp.)
- Hosts (major)  
  - Colorado blue spruce  
  - Other spruces: Black, Engelmann, Serbian, Sitka, white (Black Hills)

- Hosts (minor)  
  - Pines: Austrian, mugo, eastern white pine  
  - Douglas fir  
  - Hemlock  
  - Balsam fir and other firs
- Favorable environment  
  - Long periods of needle wetness  
  - High humidity

- 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  
  - Decontaminate pruning tools  
  (70% alcohol, 10% bleach, disinfectants)

- Control  
  - Use fungicides to prevent infections  
    - Copper, chlorothalonil  
    - Alternate active ingredients (FRAC Codes)  
    - Bud break  
    - 3-4 week application interval under favorable conditions
Diseases of Conifers
Spruce Needle Drop

- **Pathogen(?):** *Setomelanomma holmii*
- **Hosts**
  - Colorado blue spruce
  - Other spruces
- **Favorable environment**
  - Wet weather (?)
  - Stress (?)


Diseases of Conifers
Spruce Needle Drop

- **Control**
  - Unclear
  - Prune diseased branches
  - Decontaminate pruning tools
    - (70% alcohol, 10% bleach, disinfectants)
  - Prevent tree stress
  - DO NOT use fungicides

Diseases of Conifers
Cytospora Canker

- **Pathogen**
  - *Leucostoma (Valsa) kunzei*
  - *Leucocytospora (Cytospora) kunzei*
- **Hosts**
  - Spruces (particularly Colorado blue spruce)
  - Douglas fir
  - Many other conifers
- **Favorable environment:** Wet weather
Diseases of Conifers

**Cytospora Canker**

- **Control**
  - DO NOT plant Colorado blue spruce
  - DO NOT crowd trees when planting
  - Thin branches to increase airflow
  - Prevent tree stress
  - Prune diseased branches
  - Decontaminate pruning tools
    (70% alcohol, 10% bleach, disinfectants)
  - DO NOT use fungicides

**Dothistroma Needle Blight**

- **Pathogen**
  - *Scirrhia (Mycosphaerella) pini*
  - *Dothistroma pini*

- **Hosts**
  - Austrian pine
  - Mugo pine
  - Ponderosa pine

- **Favorable environment**: Wet weather

**Diseases of Conifers**

**Dothistroma Needle Blight**

- **Control**
  - Plant disease-free trees
  - Plant resistant/immune tree species
  - Remove fallen infected needles
  - Use fungicides to prevent infections
    - Copper-containing fungicides
    - Early June
    - 1 application, or 2 applications spaced 3-4 weeks apart

**Diplodia (Sphaeropsis) Tip Blight**

- **Pathogen**: *Diplodia pinae*  
  *(Sphaeropsis sapinea)*

- **Hosts (major)**
  - Austrian pine
  - Other pines: red, jack, Scots, mugo

- **Hosts (minor)**
  - Other conifers: cedars, cypresses, firs, spruces, junipers, yews

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

**Diplodia (Sphaeropsis) Tip Blight**

- **Control**
  - DO NOT plant Austrian pines
  - Prevent tree stress, particularly water stress
  - Thin branches to increase airflow
  - Prune diseased branches
  - Decontaminate pruning tools
    - (70% alcohol, 10% bleach, disinfectants)
  - Remove infected cones (?)

**Diplodia (Sphaeropsis) Tip Blight**

- **Control**
  - Use fungicides to prevent infections
    - Thiophanate-methyl, chlorothalonil
    - Alternate active ingredients (FRAC Codes)
    - Bud break through shoot elongation
    - 14 day application interval

**Diseases of Conifers**

**White Pine Blister Rust**

- **Pathogen:** *Cronartium ribicola*
- **Hosts**
  - White pine
  - Gooseberry/Currants (*Ribes* spp.)
- **Favorable environment:** Wet weather
Diseases of Conifers

White Pine Blister Rust

- Control
  - Remove and destroy gooseberries/currants
  - Plant pines other than white pine
  - DO NOT overcrowd white pines
  - Keep weeds under control
  - DO NOT overhead irrigate
  - Scout routinely for disease

Diseases of Conifers

White Pine Blister Rust

- Control
  - Prune diseased branches
  - Prune healthy branches from the ground up
  - Decontaminate pruning tools
    (70% alcohol, 10% bleach, disinfectants)

Pathogen: *Phomopsis juniperovora*

Host: Junipers

Favorable environment
- Cool temperatures
- Wet weather
- Factors stimulating excessive host growth

Diseases of Conifers

Phomopsis Tip Blight

- Control
  - Use resistant varieties
    [https://store.extension.iastate.edu/Product/Juniper-Diseases](https://store.extension.iastate.edu/Product/Juniper-Diseases)
  - DO NOT crowd trees/shrubs when planting
  - Prevent tree/shrub stress
  - Avoid over-fertilization, particularly with nitrogen
  - Prune diseased branches, but avoid excessive pruning

Phomopsis Tip Blight

- Control
  - Decontaminate pruning tools
    (70% alcohol, 10% bleach, disinfectants)
  - Use fungicides to prevent infections
    - Mancozeb, copper, thiophanate-methyl
    - Alternate active ingredients (FRAC Codes)
    - Bud break through period of rapid growth
    - 7-21 day application interval

Use fungicides to prevent infections
- Mancozeb, copper, thiophanate-methyl
- Alternate active ingredients (FRAC Codes)
- Bud break through period of rapid growth
- 7-21 day application interval
**Diseases of Conifers**

**“Cedar-Apple” Rusts**

- **Pathogens:** *Gymnosporangium* spp.
- **Hosts**
  - Junipers
  - Rosaceous plants (apple, crabapple, hawthorn, quince, pear)
- **Favorable environment:** Wet weather

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**Control**

- Use resistant cultivars/varieties
- Remove galls
- Decontaminate pruning tools (70% alcohol, 10% bleach, disinfectants)

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**Diseases of Conifers**

**Armillaria Root Disease**

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

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**Control**

- Use fungicides to prevent infections
  - Ferbam, triadimefon
  - Alternate active ingredients (FRAC Codes)
  - Mid-May through mid-June (rosaceous hosts)
  - Early July through August (juniper hosts)
  - 7-21 day application interval
Diseases of Conifers

**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

**Diseases of Conifers**

**Herbicide Injury**

- **Causes**
  - Growth regulator herbicides
    - 2,4-D
    - Dicamba
    - Imi
  - Other classes of herbicides
- **Affected plants:** Anything and everything

**Diseases of Conifers**

**Herbicide Injury**

- **Control**
  - Apply herbicides only when needed
  - Follow application directions exactly
  - Apply herbicides only when wind speed is low (< 5 mph)
  - DO NOT apply herbicides too close to nontarget plants
  - Apply herbicides at low pressure
**Diseases of Conifers**

**Herbicide Injury**

- Control
  - Use amine rather than ester forms of herbicides
  - Adequately test herbicides prior to registration!

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**Diseases of Conifers**

**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@plantpath.wisc.edu
http://pddc.wisc.edu
Follow on Twitter @UWPDDC