Diseases of Conifers

**Rhizosphaera Needle Cast**

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

- **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

- **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 (?)


Control
- Unclear
- Prune diseased branches
- Prevent tree stress
- DO NOT use fungicides

Diseases of Conifers
Cytospora Canker

- **Pathogen**
  - Leucostoma (Valsa) kunzei
  - Leucocyotospora (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
  - DO NOT use fungicides

**Dothistroma Needle Blight**

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

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

- **Favorable environment:** Wet weather

**Cytospora Canker**

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

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

- **Favorable environment:** Wet weather

**Diseases of Conifers**

**Diplodia (Sphaeropsis) Tip 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

- **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
  - Remove infected cones

**Diplodia (Sphaeropsis) Tip Blight**

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

**Diseases of Conifers**

**White Pine Blister Rust**

- **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

- **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

White Pine Blister Rust

- **Control**
  - Prune diseased branches
  - Prune healthy branches from the ground up
  - Disinfest pruning tools
    - 70% alcohol
    - 10% bleach
    - Commercial disinfectants

Phomopsis Tip Blight

- **Pathogen:** Phomopsis juniperovora
- **Host:** Junipers
- **Favorable environment**
  - Cool temperatures
  - Wet weather
  - Factors stimulating excessive host growth

Phomopsis Tip Blight

- **Control**
  - Use resistant varieties
  - 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**
  - 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

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

• Control
  – Use resistant cultivars/varieties
  – Remove galls
  – 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

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**Diseases of Conifers
Herbicide Injury**

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

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**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

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**Diseases of Conifers
Herbicide Injury**

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