

## Level II Master Gardener Training

### Diseases of Conifers

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### Diseases of Conifers Rhizosphaera Needle Cast

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

### Diseases of Conifers Rhizosphaera Needle Cast

- 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



### Diseases of Conifers Rhizosphaera Needle Cast

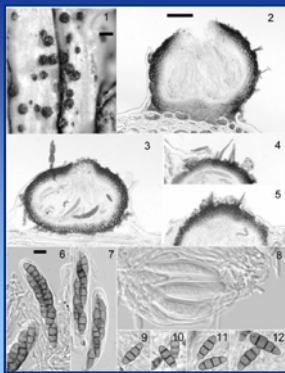
- Control
  - DO NOT plant Colorado blue spruce
  - DO NOT crowd trees when planting
  - Thin healthy branches to increase airflow
  - Prevent tree stress
  - Prune diseased branches

### Diseases of Conifers Rhizosphaera Needle Cast

- 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 (?)



From:  
Rossman, A. Y., Farr, D. F., Castlebury, L. A., Shoemaker, R., and Mengistu, A. 2002. *Setomelanomma holmii* (Pleosporales, Phaeosphaeriaceae) on living spruce twigs in Europe and North America. *Can. J. Bot.* 80: 1209-1215.

## Diseases of Conifers Spruce Needle Drop

- **Control**
  - Unclear
  - Prune diseased branches
  - 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

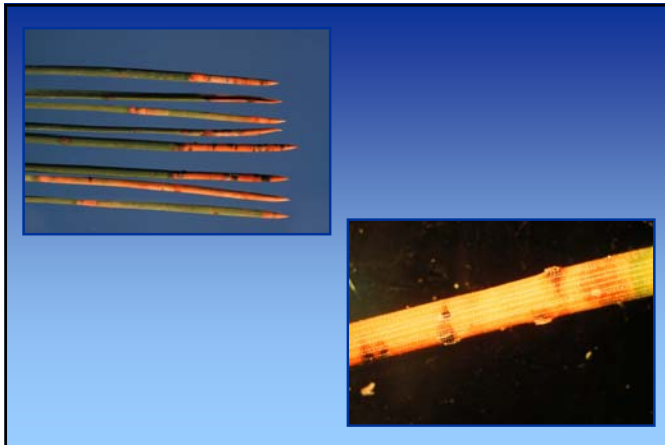


### Diseases of Conifers Cytospora Canker

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

### Diseases of Conifers 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

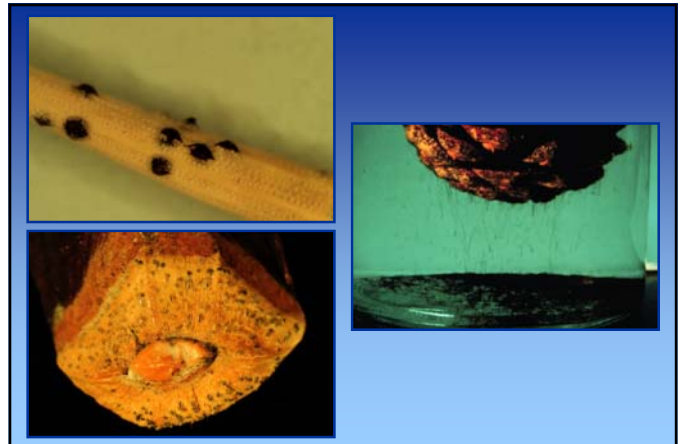
- **Control**
  - Plant disease-free trees
  - Plant resistant/immune tree species
  - Remove fallen infected needles
  - Use fungicides to prevent infections
    - Copper-containing fungicides
    - Early June
    - 1 application, or 2 applications spaced 3-4 weeks apart

### 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

### Diseases of Conifers Diplodia (Sphaeropsis) Tip Blight

- **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

### Diseases of Conifers *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
  - Disinfect pruning tools
    - 70% alcohol
    - 10% bleach
    - Commercial disinfectants

### Diseases of Conifers Phomopsis Tip Blight

- **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>)
  - DO NOT crowd trees/shrubs when planting
  - Prevent tree/shrub stress
  - Avoid over-fertilization, particularly with nitrogen
  - Prune diseased branches, but avoid excessive pruning

### Diseases of Conifers 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 "Cedar-Apple" Rusts

- **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

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



## 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
    - Imprelis!
  - 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!

***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  
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