

LGMSC

Diseases of Conifers

Brian D. Hudelson

Department of Plant Pathology

University of Wisconsin-Madison/Extension



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)*

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

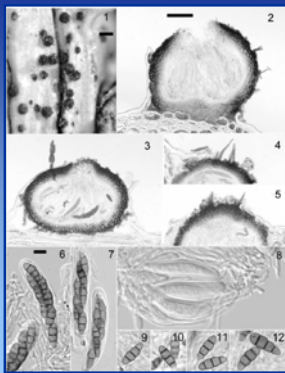
- **Control**
 - DO NOT plant Colorado blue spruce
 - DO NOT crowd trees when planting
 - Thin healthy branches to increase airflow
 - Prevent tree stress
 - Prune diseased branches
 - Decontaminate pruning tools
(70% alcohol, 10% bleach, disinfectants)

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
 - 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**

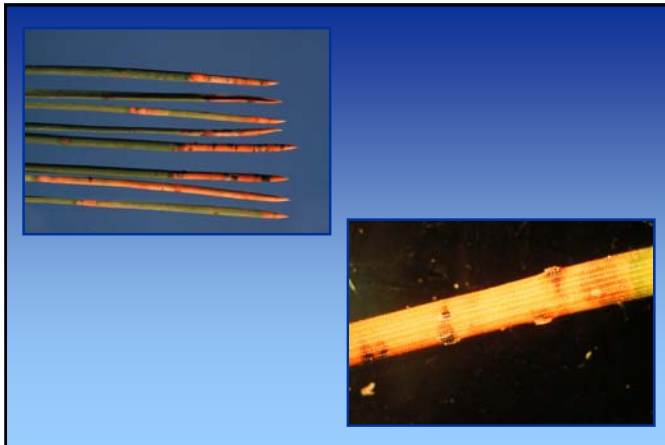


Diseases of Conifers Cytospora Canker

- **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

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

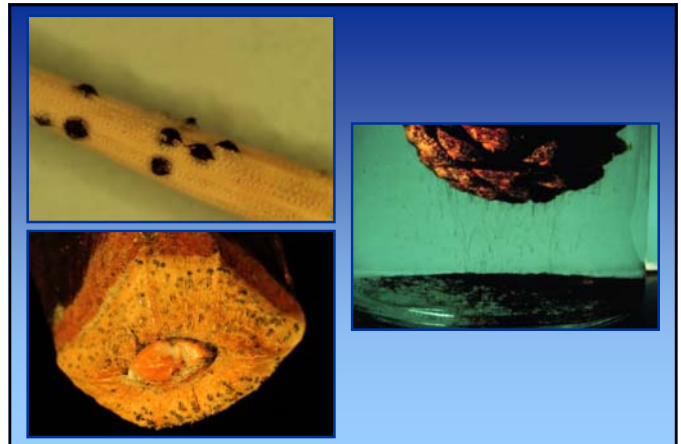
- **Control**
 - Plant disease-free trees
 - Plant resistant/immune tree species
 - Remove fallen infected needles
 - Use fungicides to prevent infections
 - Copper-containing fungicides
 - Early June
 - 1 application, or 2 applications spaced 3-4 weeks apart

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

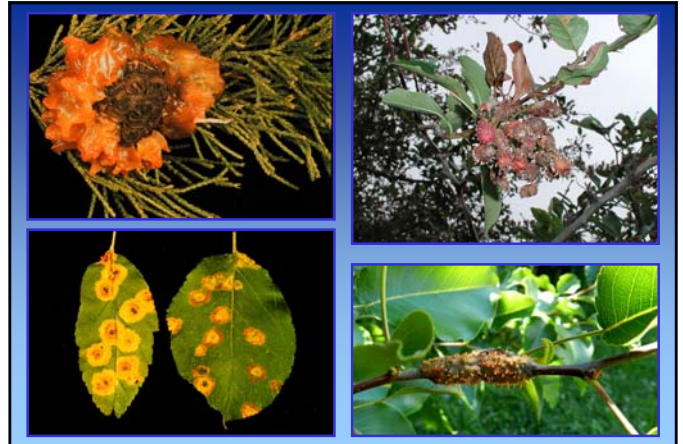
- **Control**
 - Use resistant varieties
(<https://store.extension.iastate.edu/Product/Juniper-Diseases>)
 - DO NOT crowd trees/shrubs when planting
 - Prevent tree/shrub stress
 - Avoid over-fertilization, particularly with nitrogen
 - Prune diseased branches, but avoid excessive pruning

Diseases of Conifers Phomopsis Tip Blight

- **Control**
 - 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

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

Diseases of Conifers "Cedar-Apple" Rusts

- 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

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