

Spring Into Gardening 2020

Conifer Diseases

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Conifer Diseases 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)

Conifer Diseases 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



Conifer Diseases Rhizosphaera Needle Cast

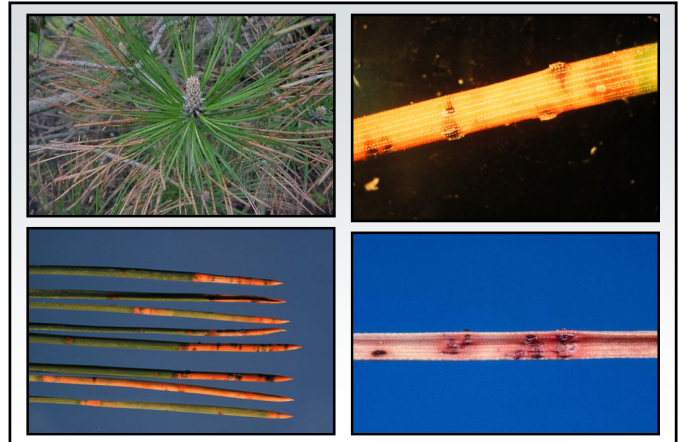
- Control
 - DO NOT plant Colorado blue spruce
 - DO NOT crowd trees when planting
 - Plant dwarf spruce varieties
 - Thin healthy branches to increase airflow
 - Prevent tree stress
 - Prune diseased branches

Conifer Diseases Rhizosphaera Needle Cast

- Control
 - Decontaminate pruning tools (70% alcohol, disinfectants, 10% bleach)
 - Use fungicides to prevent infections
 - Copper, chlorothalonil
 - Alternate active ingredients (FRAC Codes)
 - Start applications at bud break
 - Apply at 3-4 week intervals under favorable conditions

Conifer Diseases Dothistroma Needle Blight

- Pathogen: *Dothistroma pini*
- Hosts
 - Austrian pine
 - Mugo pine
 - Ponderosa pine
- Favorable environment: Wet weather



Conifer Diseases Dothistroma Needle Blight

- Control
 - Plant disease-free trees
 - Plant resistant/immune tree species
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - Hot compost

Conifer Diseases Dothistroma Needle Blight

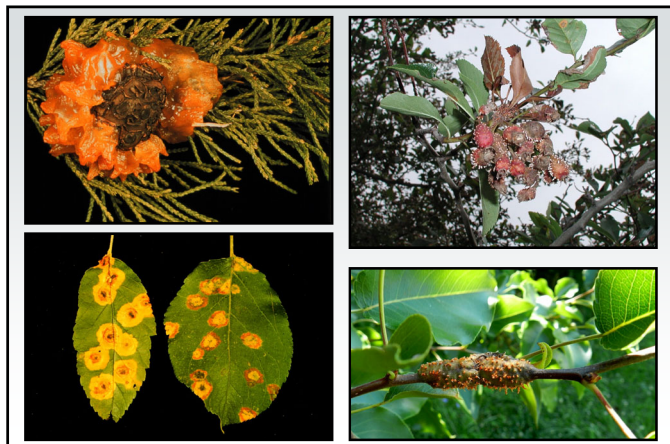
- Control
 - Use fungicides to prevent infections
 - Copper
 - Start application(s) in early June
 - Apply 1 treatment, or 2 treatments spaced 3-4 weeks apart

Conifer Diseases Gymnosporangium Rusts

- Pathogens: *Gymnosporangium* spp.
 - *Gymnosporangium juniperi-virginianae* (Cedar-apple rust)
 - *Gymnosporangium globosum* (Cedar-hawthorn rust)
 - *Gymnosporangium clavipes* (Cedar-quince rust)

Conifer Diseases Gymnosporangium Rusts

- Hosts
 - Junipers
 - Rosaceous plants
 - Apple, crabapple
 - Hawthorn
 - Quince
 - Pear
 - Serviceberry
- Favorable environment: Wet weather



Conifer Diseases Gymnosporangium Rusts

- Control
 - Grow only junipers or rosaceous hosts
 - Use resistant cultivars/varieties
 - “Juniper Diseases”
(<https://store.extension.iastate.edu/Product/Juniper-Diseases>)
 - “Home Fruit Cultivars for Northern Wisconsin”
(<https://learningstore.extension.wisc.edu/>)
 - “Home Fruit Cultivars for Southern Wisconsin”
(<https://learningstore.extension.wisc.edu/>)

Conifer Diseases Gymnosporangium Rusts

- Control
 - Remove galls
 - Decontaminate pruning tools
(70% alcohol, disinfectants, 10% bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury

Conifer Diseases Gymnosporangium Rusts

- Control
 - Use fungicides to prevent infections (?)
 - Treat rosaceous hosts
 - Chlorothalonil, copper, ferbam, mancozeb, propiconazole, sulfur, and triadimefon
 - Alternate active ingredients (FRAC Codes)
 - Apply when flowers first show color, when half of flowers open, at petal fall, 7 to 10 days after petal fall, and 10 to 14 days later

Conifer Diseases White Pine Blister Rust

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



Conifer Diseases 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

Conifer Diseases White Pine Blister Rust

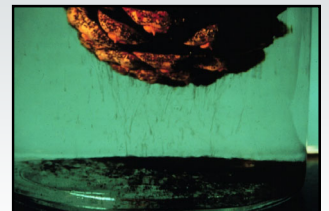
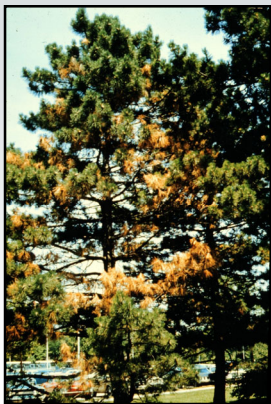
- Control
 - Prune diseased branches
 - Prune healthy branches from the ground up
 - Disinfect pruning tools
(70% alcohol, disinfectants, 10% bleach)
- DO NOT use fungicides

Conifer Diseases 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

Conifer Diseases Diplodia (Sphaeropsis) Tip Blight

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



Conifer Diseases

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, disinfectants, 10% bleach)
 - Remove infected cones (?)

Conifer Diseases

Diplodia (Sphaeropsis) Tip Blight

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

Conifer Diseases

Cytospora Canker

- Pathogen
 - *Leucostoma (Valsa) kunzei*
 - *Cytospora (Leucocytospora) kunzei*
 - *Cytospora* spp.
- Hosts
 - Spruces (particularly Colorado blue spruce)
 - Many other conifers
- Favorable environment: Wet weather



Conifer Diseases

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, disinfectants, 10% bleach)

Conifer Diseases

Cytospora Canker

- Control
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT use fungicides

Conifer Diseases Phomopsis Tip Blight

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



Conifer Diseases Phomopsis Tip Blight

- Control
 - Use resistant cultivars/varieties
 - “Juniper Diseases”
(<https://store.extension.iastate.edu/Product/Juniper-Diseases>)
 - DO NOT crowd trees/shrubs when planting
 - Prevent tree/shrub stress
 - Avoid over-fertilization with nitrogen

Conifer Diseases Phomopsis Tip Blight

- Control
 - Prune diseased branches
 - Avoid excessive pruning
 - Decontaminate pruning tools
(70% alcohol, disinfectants, 10% bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury

Conifer Diseases Phomopsis Tip Blight

- Control
 - Use fungicides to prevent infections
 - Mancozeb, copper, thiophanate-methyl
 - Alternate active ingredients (FRAC Codes)
 - Apply from bud break through period of rapid growth
 - Apply every 7-21 days

Conifer Diseases Root/Crown Rots

- Pathogens
 - *Rhizoctonia solani*
 - *Fusarium* spp.
 - *Cylindrocarpon* spp.
 - *Pythium* spp.
 - *Phytophthora* spp.
- Hosts
 - Any evergreen
 - Yew, fir particularly
- Favorable environment: Cool, wet soils



Conifer Diseases Root/Crown Rots

- **Control**
 - Moderate soil moisture
 - Grow trees and shrubs in well-drained sites
 - Use a soil with adequate drainage
 - Improve drainage in poorly drained soils
 - Add organic matter to improve drainage
 - Use raised beds
 - DO NOT overwater
 - DO NOT overmulch

Conifer Diseases Root/Crown Rots

- **Control**
 - DO NOT move contaminated soil or plants
 - Decontaminate infested tools, pots, work areas
 - Pretest soils/mulches/composts
 - Use soil-less potting mixes for containerized plants

Conifer Diseases Root/Crown Rots

- **Control**
 - Use fungicides to prevent infections
 - PCNB, thiophanate-methyl, fludioxonil, Etridiazole, metalaxyl/mefenoxam, fosetyl-Al
 - Use granular formulations if possible
 - Use during periods of wet weather
 - Use biopesticides to prevent infections
 - *Trichoderma*, *Gliocladium*
 - Use for potted plants

Conifer Diseases Winter Injury/Winter Burn

- **Causes**
 - Water stress
 - High winds
 - Extreme winter temperatures
 - Insufficient snow cover
 - Cycling winter temperatures
 - Excessive snow
 - Ice

Conifer Diseases Winter Injury/Winter Burn

- **Affected plants**
 - Yew
 - Spruce (Alberta)
 - Boxwood
 - Arborvitae



Conifer Diseases **Winter Injury/Winter Burn**

- **Management**
 - Water trees and shrubs adequately
 - Plant trees and shrubs
 - Properly
 - In protected locations (sensitive plants)
 - Protect sensitive plants
 - Pray for
 - Lots of snow
 - A slow, gradual spring warm up

Conifer Diseases **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
<https://pddc.wisc.edu>
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