

Talks for the General Public

Diseases of Evergreens

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Diseases of Evergreens 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 Evergreens 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 Evergreens Rhizosphaera Needle Cast

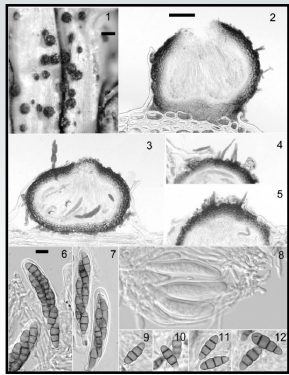
- Control
 - DO NOT plant Colorado blue spruce
 - DO NOT crowd trees when planting
 - Plant dwarf spruce varieties
 - Thin healthy branches to increase airflow
 - Prevent tree stress
 - Prune diseased branches

Diseases of Evergreens Rhizosphaera Needle Cast

- Control
 - Decontaminate pruning tools (70% alcohol, disinfectants, 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

Diseases of Evergreens Spruce Needle Drop

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



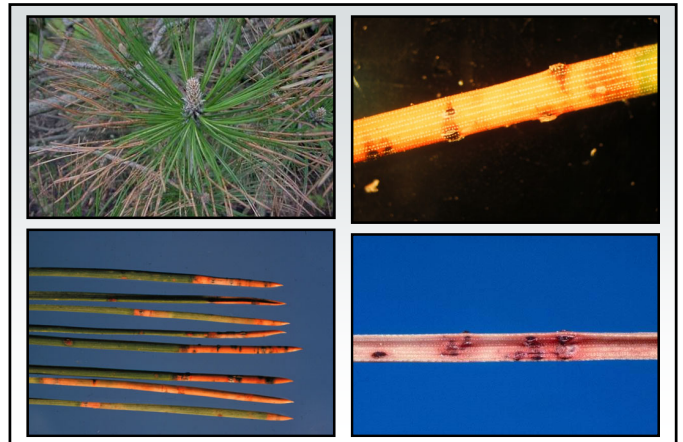
From:
 Rossman, A. Y., Farr, D. F., Castlebury, L. A., Shoemaker, R., and Mengistu, A. 2002. *Setomelanomma holmii* (Pleosporales, Phaeosphaeriaceae) on living spruce twigs in Europe and North America. *Can. J. Bot.* 80: 1209-1215.

Diseases of Evergreens Spruce Needle Drop

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

Diseases of Evergreens Dothistroma Needle Blight

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



Diseases of Evergreens Dothistroma Needle Blight

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

Diseases of Evergreens 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

Diseases of Evergreens Boxwood Blight

- **Pathogen**
 - *Calonectria pseudonaviculata*
 - *Cylindrocladium pseudonaviculatum* (*Cylindrocladium buxicola*)
- **Hosts**
 - Boxwood
 - Pachysandra
- **Favorable Environment: Cool, wet weather**



Diseases of Evergreens Boxwood Blight

- **Control**
 - Be cautious about holiday wreaths
 - Use shrubs other than boxwood
 - Buy locally produced boxwood
 - Buy from a reputable supplier

Diseases of Evergreens Boxwood Blight

- **Control**
 - Grow resistant varieties
 - Hybrid boxwood
 - ‘Green Gem’
 - ‘Karzgreen’ (Green Ice®)
 - Japanese littleleaf boxwood
 - ‘Jim Stauffer’
 - ‘Little Missy’
 - ‘Winter Gem’

Diseases of Evergreens Boxwood Blight

- **Control**
 - Grow resistant varieties
 - Korean littleleaf boxwood
 - ‘Eseles’ (Wedding Ring®)
 - ‘Franklin’s Gem’
 - ‘Pincushion’
 - ‘Wee Willie’
 - ‘Winter Beauty’
 - ‘Wintergreen’

Diseases of Evergreens Boxwood Blight

- **Control**
 - Avoid symptomatic plants
 - DO NOT replant in an area where boxwood blight has been a problem
 - Keep new plants isolated
 - Space plants far apart
 - DO NOT overhead water
 - Prune out diseased branches

Diseases of Evergreens Boxwood Blight

- **Control**
 - Decontaminate pruning tools (70% alcohol, commercial disinfectants)
 - Remove and destroy infected plants
 - Burn (where allowed)
 - Deep bury (two feet)/Double bag and landfill
 - DO NOT compost

Diseases of Evergreens Boxwood Blight

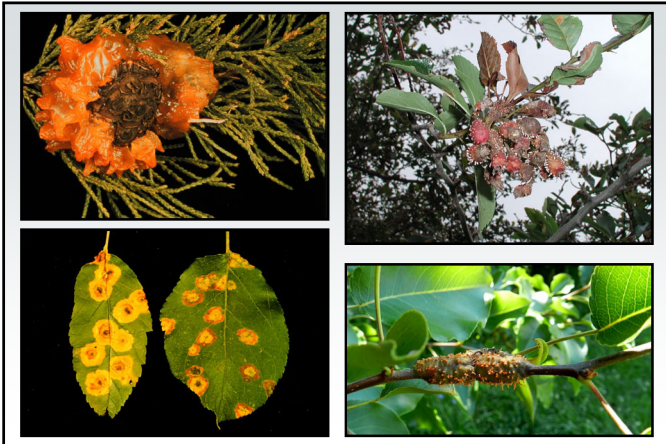
- **Control**
 - Use fungicides to prevent infections
 - Chlorothalonil (alone or with propiconazole or thiophanate-methyl), fludioxonil, metconazole, tebuconazole
 - Alternate active ingredients (FRAC codes)
 - Apply at 7-day intervals
 - Contact the PDDC if you suspect you have infected boxwoods

Diseases of Evergreens Gymnosporangium Rusts

- **Pathogens: *Gymnosporangium* spp.**
 - *Gymnosporangium juniperi-virginianae* (Cedar-apple rust)
 - *Gymnosporangium globosum* (Cedar-hawthorn rust)
 - *Gymnosporangium clavipes* (Cedar-quince rust)
 - *Gymnosporangium yamadai* – NEW! (Japanese apple rust)

Diseases of Evergreens Gymnosporangium Rusts

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



Diseases of Evergreens Gymnosporangium Rusts

- Control
 - Grow only junipers or rosaceous hosts
 - Use resistant cultivars/varieties
 - “Juniper Diseases”
(<https://store.extension.iastate.edu/Product/Juniper-Diseases>)
 - “Disease and Insect Resistant Ornamental Plants: Juniperus (Junipers)”
(<https://ecommons.cornell.edu/handle/1813/56372.2>)

Diseases of Evergreens Gymnosporangium Rusts

- Control
 - Use resistant cultivars/varieties
 - “Home Fruit Cultivars for Northern Wisconsin”
(<https://learningstore.extension.wisc.edu/>)
 - “Home Fruit Cultivars for Southern Wisconsin”
(<https://learningstore.extension.wisc.edu/>)

Diseases of Evergreens Gymnosporangium Rusts

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

Diseases of Evergreens 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

Diseases of Evergreens
White Pine Blister Rust

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



Diseases of Evergreens
White Pine Blister Rust

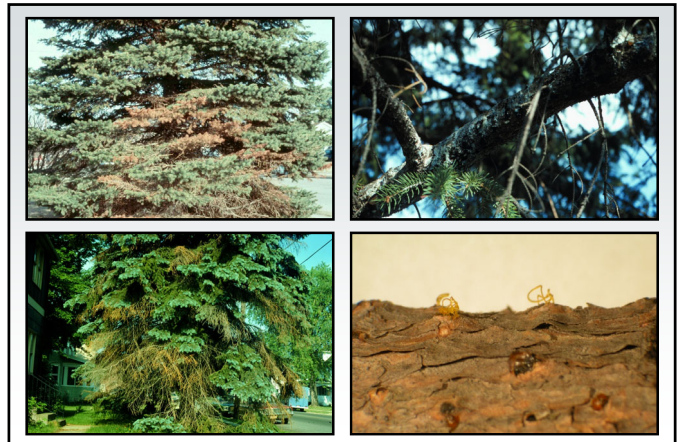
- Control
 - Remove and destroy gooseberries/currants
 - Plant pines other than white pine
 - DO NOT overcrowd white pines
 - Keep weeds under control
 - DO NOT overhead irrigate
 - Scout routinely for disease

Diseases of Evergreens
White Pine Blister Rust

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

Diseases of Evergreens
Cytospora Canker

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



Diseases of Evergreens 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, bleach)

Diseases of Evergreens Cytospora Canker

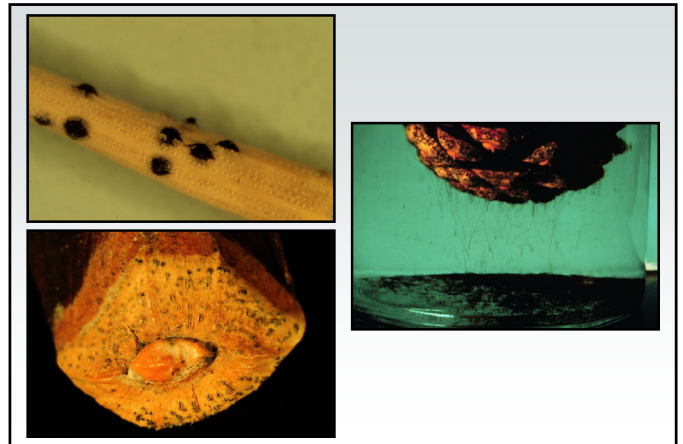
- Control
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT use fungicides

Diseases of Evergreens Diplodia Shoot Blight and Canker

- Pathogens: *Diplodia (Sphaeropsis)* spp.
- Hosts (major)
 - Austrian pine
 - Other pines: red, jack, Scots, mugo
- Hosts (minor)
 - Other conifers: cedars, cypresses, firs, spruces, junipers, yews

Diseases of Evergreens Diplodia Shoot Blight and Canker

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



Diseases of Evergreens

Diplodia Shoot Blight and Canker

- 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, bleach)
 - Remove infected cones (?)

Diseases of Evergreens

Diplodia Shoot Blight and Canker

- 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

Diseases of Evergreens

Phomopsis Tip Blight

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



Diseases of Evergreens

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

Diseases of Evergreens

Phomopsis Tip Blight

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

Diseases of Evergreens 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

Diseases of Evergreens 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



Diseases of Evergreens 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

Diseases of Evergreens 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

Diseases of Evergreens 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

Diseases of Evergreens Armillaria Root Disease

- Pathogens: *Armillaria* spp.
- Hosts
 - Many evergreens
 - Many deciduous trees and shrubs
- Favorable environment
 - Drought stress
 - Defoliation stress
 - Other stresses

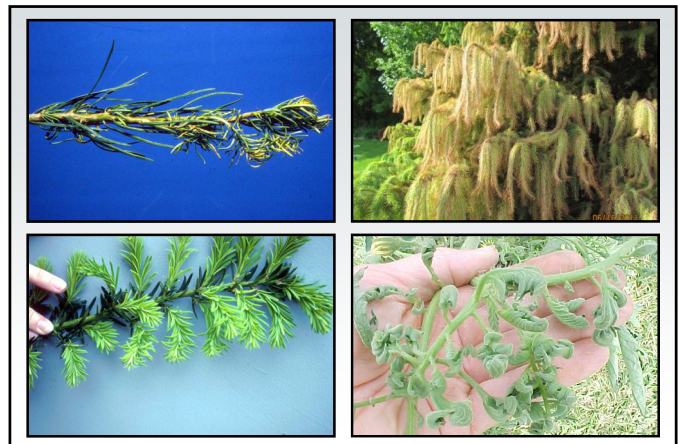


Diseases of Evergreens Armillaria Root Disease

- 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 Evergreens Herbicide Injury

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



Diseases of Evergreens Herbicide Injury

- **Management**
 - 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 Evergreens Herbicide Injury

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

Diseases of Evergreens Winter Injury/Winter Burn

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

Diseases of Evergreens Winter Injury/Winter Burn

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



Diseases of Evergreens 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

Diseases of Evergreens
Other Abiotic Disorders



Salt Injury



Chlorosis



Construction Injury



Water Stress



Girdling Root



Lawn Mower Injury

Diseases of Evergreens
Non-Diseases



Seasonal Needle Drop



Sooty Mold



Sooty Mold



Seasonal Needle Drop

Diseases of Evergreens
Non-Diseases: Fungi/Fungal Allies



Giant Puffballs



Lichens



Stink Horns



Bird's Nest Fungi



Slime Molds

Diseases of Evergreens
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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